



## Father of Admission Test (FOAT)

### [3rd Edition]



# JU PMSCS

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আসসালামু আলাইকুম,

আমি মুস্তাকিম বিলাহ বেদার, এই PDF টি শুধুমাত্র আমার সহপাঠি ও পরবর্তি প্রজন্মকে তাদের কাংখিত বিশ্ববিদ্যালয়ে  
চাঙ পাওয়ার রাষ্ট্র দেখিয়ে দেয়ার জন্য বানিয়েছি। ইতিমধ্যে আমার ইলেক্ট্রোক্ষন এবং গাইডলাইন ফলো করে অসংখ্য  
ছাত্রছাত্রী বিভিন্ন জায়গায় মাস্টার্স করছে (BUET, DU, JU, JnU, BUP and so on)। এই PDF টি বিশেষভাবে PMSCS  
(JU) এর জন্য প্রস্তুত করা হয়েছে। PMSCS এ আমার গাইডলাইন ফলো করে More than 250 students (So far)  
চাঙ পেয়েছে। Father of Admission Test (FOAT) এর এরকম আরও চারটি PDF রয়েছে যেগুলো JU PMIT, Jnu  
MSc in CSE (Professional), DU MIT and BUET MSc in CSE এর জন্য বিশেষভাবে তৈরি করা হয়েছে। PDF এর  
শেষে কিছু প্রিভিয়ার্স ইয়ার্স কোষ্টেন দেয়া আছে, কিছু সলুশন আমি নিজ হাতে করেও দিয়েছে। উল্লেখ্য এই যে,  
এডমিশন টেক্সের প্রশ্ন, এক্সাম এর উত্তরপত্রের সাথে জমা নিয়ে নেয়া হয় তাই এই PDF এ যা পাচ্ছেন তার জন্য  
শুকরিয়া করা উচিত।

এই PDF গুলো কেবল FOAT এর পেইড গুগল ক্লাসরুম মেম্বারদেরকেই দেয়া হয়। তাই আপনি যদি অন্যের কাছ  
থেকে এই PDF টি নিয়ে থাকেন তাহলে আপনার উচিত হবে গুগল ক্লাসরুমের এন্ট্রি ফি দিয়ে বাকি PDF গুলোও  
কালেষ্ট করে নেয়া। গুগল ক্লাসরুম সম্পর্কে ডিটেইল জানতে আমাদের পেজ এ ইনবক্স করুন।

Facebook Page Link: [www.facebook.com/FOAT2023](https://www.facebook.com/FOAT2023)

Facebook Group Link: <https://www.facebook.com/groups/858042971559671>

Youtube Link: <https://www.youtube.com/@Bedar123>

বিঃদ্রঃ সর্বোচ্চ প্রিপারেশনের জন্য ইউনিভার্সিটি রিকমেন্ডেড বই এর কোনো বিকল্প নেই।

### **Applicant's Eligibility [PMSCS]**

Applicants must satisfy any one of the following criteria:

- BSc (Engineering) in any discipline from any recognized University
- 4-year BSc (or 3-year Honors + 1-year MSc) in CS/CSE/IT/EEE/ECE/ETE or equivalent
- 4-year BSc (or 3-year Honors + 1-year MSc) in Physics/Mathematics/Statistics/Geological/Sciences/Chemistry/Environmental Sciences
- 4-year BSc (or 3-year Honors + 1-year MSc) in any subject with at least 1-year PGD in CSE/IT or equivalent

N.B. Candidates with third Division Class or CGPA below **2.50** at any level of their academic career are not eligible to apply.

[Source: Admission Notice of CSE department]

### **Subjects to crack PMSCS Admission Test**

1. Computer fundamental
2. Programing (C and C++ with OOP)
3. Data Structures and Algorithms
4. Microprocessor
5. Database
6. Data communication and Networking
7. Operating System
8. Digital logics and Electronics
9. Mathletics/Statistics and Probability
10. General Math
11. IQ ICT related
12. Basic English [Grammar (Specially preposition, right form of verb), Synonym, Antonym]

### **80% Questions from CSE Core Subjects (1-8 above)**

### **Mark Distribution**

Total 50 marks

**MCQ 40\*1=40, Written 10\*1=10. [Recent Procedure]**

**MCQ 30\*1=30, written 10\*2=20. [Older Procedure]**

আরও ভালোভাবে বুঝতে আমার এই ভিডিওটি দেখুন: [https://youtu.be/Z\\_z3H\\_jLVNo](https://youtu.be/Z_z3H_jLVNo)

বিঃ দ্রঃ করোনা বা অন্যান্য কারনে অনলাইনে এক্সাম হলে পড়ার প্যাটার্ন কিছুটা চেঙে করতে হয়। সেক্ষেত্রে নিয়মিত আমার

Admission Test facebook গ্রুপে ঢোক রাখুন। <https://www.facebook.com/groups/858042971559671>

## **Courses offered by PMSCS**

### **Prerequisite Courses**

1. Structured Programming
2. Object Oriented Programming
3. Discrete Mathematics
4. Data Structures
5. Computer Architecture
6. Operating Systems
7. Data Communication
8. Numerical Methods
9. Signals and systems
10. Computer Graphics
11. Software Engineering
12. Database System
13. Simulation and Modeling
14. Computer Networks
15. Human Computer Interaction
16. Algorithm Analysis and Design
17. System Analysis and Design
18. Multimedia Communication
19. Math Lab Programming
20. Web Design and Programming
21. Computer Ethics & Cyber Law

### **Core Courses:**

1. Cloud Computing
2. Software Design and Development
3. Advanced Database Management System
4. E-Commerce
5. Advanced Operating Systems
6. Artificial Intelligence and Expert System
7. Parallel and Distributed Computing
8. Mobile and Wireless Communication Systems
9. Network Management
10. Software Project Management and quality Assurance
11. Mobile Application Development
12. Digital Signal Processing
13. Digital Image Processing
14. Computer vision
15. Medical imaging
16. Data Mining
17. Industrial Automation Systems
18. Health Informatics
19. Management information System
20. Software Testing
21. Web Application Security
22. Neuro Informatics
23. Switching and Routing Technology
24. Network Security
25. Information Theory and Coding System
26. Artificial Neural Networks
27. Embedded System Engineering
28. Telecommunication Network Planning and Optimization
29. Telemedicine and Telehealth
30. Adhoc Networks
31. Digital Forensic
32. Robotics
33. internet Engineering and IP Technology
34. internet Technologist and Applications
35. Introduction to Data Science
36. Internet of Things and Sensor Networks
37. Natural Language Processing
38. Network Programming
39. Machine Learning

**All the courses are not available right now. Approximately 35 courses are available in each session.**

**Teachers List**  
**Jahangirnagar University**  
**Department of Computer Science and Engineering**

initial	Name	Background
HA	Dr. Mohammad Hanif Ali	B.Sc(JU), MSc.(JU), PhD(UK)Professor
JKD	Dr. Jugal Krishna Das	B.Sc(Donetsk), MSc.(Donetsk), PhD(Kiev)Professor
MSU	Dr. Mohammad Shorif Uddin	B.Sc. Engg. (BUET), M.Tech.Ed. (Japan), Ph.D. (Japan)Professor
ZR	Dr. Mohammad Zahidur Rahman	B.Sc(BUET), MSc.(BUET), PhD(Malaysia) Professor
II	Dr. Md. Imdadul Islam	B.Sc. Engg. (BUET), MSc. Engg. (BUET), PhD (JU)Professor
LJR	Dr. Liton Jude Rozario	B.Sc(JU), MS(JU), PhD(JU)Professor
GM	Md. Golam Moazzam	B.Sc(JU), MS(JU) Professor, PHD (JU) (Coordinator)
IJ	Dr. Israt Jahan	B.Sc(BUET), MSc.(BUET), PhD (JU)Professor
HK	Dr. Md. Humayun Kabir	B.Sc(DU), MSc.(DU), PhD(Ireland)Professor
AKA	Md. Abul Kalam Azad	B.Sc(JU), MSc.(KTH, Sweden)Professor
ASMMR	Dr. Abu Sayed Md. Mostafizur Rahaman	B.Sc(JU), MSc.(Germany) PhD(JU)Professor
EI	Dr. Md. Ezharul Islam	B.SC. (JU), M.ENGG.(JAPAN), PHD(JAPAN)Associate Professor
MA	Dr. Morium Akter	Associate Professor
MMA	Dr. Md. Musfiqur Anwar	B.Sc (JU), MSc. (Japan), PhD (Australia) Associate Professor
SB	Sarnali Basak	BSC(JU), MSC (University of Edinburgh, UK)Assistant Professor
TH	Tahsina Hashem	B.Sc. (JU), M.Sc. Engg. (BUET)Assistant Professor
RJ	Md. Rafsan Jani	B.SC. (JU), MS(JU)Lecturer
SS	Sabrina Sharmin	B.Sc (JU) MS (JU)
AM	Anup Majumder	BSc (JU) MS (JU)
MAI	Mohammad Ashraful Islam	BSc(JU) MSc(JU)
BA	Bulbul Ahmed	BSc(JU) MSc(JU)

Department of Computer Science and Engineering: Staff members (Register office)

Mukul Vai: 01941336337

Rehana Mam: 01772131872

Sohid vai: 01762109478, 01935026111

## **Waiver, Credit System and Cost**

- CSE students having CGPA 3.00 or above gets waiver and completes 10 Subjects including project/thesis  
(2 prerequisite+7 core + project/thesis)
- Other Students complete 13 subjects including project/thesis (5 prerequisite+7 core+ project/thesis)
- Students can take maximum 4 courses in a semester.
- Retake option is there but you have to pay some extra for that and if you extend any semester you will have to pay more.
- 1 course = 3 credit and per credit 2.5k
- Overall cost 1 Lakh 40k (approx.) for Waived Students and 1 Lakh 65k (approx.)
- During admission you have to pay 53.5k

### **For 1st Semester (Newly admitted) Students:**

A student (who got waiver on Prerequisite courses) can take 2 Prerequisite Courses. In addition, he/she can take 1 Required Course (Maximum total 9 credit hours).

However, a student (who did not get waiver on Prerequisite courses) can take maximum 4 Prerequisite Courses (Maximum total 12 credit hours).

### **For 2nd Semester Students:**

A student (who got waiver on Prerequisite courses) can take 4 Required courses (maximum total 12-credit hours).

However, a student (who did not get waiver on Prerequisite courses) must have to take 1 Prerequisite courses. In addition, he/she can take maximum 3 Required Courses (maximum total 12-credit hours).

### **For 3rd Semester and above Students:**

A student can take maximum 12-credit hours (4 Required courses) and a 3 credit hour Research Project. Please remember that 3 credit hour Research Project is offered to only graduating students.

## **Class Routine and Mark Distribution**

- Classes are held on only Fridays. But sometimes classes are held on Saturday as a make up class and during semester final Friday and Saturday both.
- There are four time slots. 2 classes Before Jumma Salah and 2 classes after that.
- Class duration 1.5 hours (sometimes more, sometime less than that)
- 100 marks for each course. 40 marks for assignments, quiz, CT etc. and rest 60 is written exam.
- Class routine gets changed frequently.

### **Department of Computer Science and Engineering**

Jahangirnagar University

PMSCS Class Routine (Fall 2022)

**Effective from: October 14, 2022**

Regular Class: Every Friday

Makeup Class:

Class Room	9:00 – 11:00	11:15 – 1:15	3:00 – 5:00	5:15 – 7:15
CSE-101	PMSCS 651: Cloud Computing (ZR)	PMSCS 690: Machine Learning (LJR)	PMSCS 660: Software Project Management (ZR)	PMSCS 612: Database Systems (LJR)
CSE-102	PMSCS 663: Digital Image Processing (MSU)	PMSCS 658: Mobile and Wireless Comm. System (II)	PMSCS 677: Artificial Neural Networks (MSU)	PMSCS 676: Information Theory and Coding System (II)
CSE-103	PMSCS 657: Parallel and Distributed Computing (JKD)	PMSCS 616: Algorithms Analysis and Design (MAI)	PMSCS 674: Switching and Routing Tech. (JKD)	
CSE-201	PMSCS 665: Medical Imaging (AM)	PMSCS 604: Data Structures (GM)	PMSCS 664: Computer Vision (AM)	PMSCS 653: Advanced DBMS (GM)
CSE-202	PMSCS 686: Introduction to Data Science (AKA)	PMSCS 666: Data Mining (HK)	PMSCS 607: Data Communication (AKA)	PMSCS 611: Software Engineering (HK)
CSE-203	PMSCS 614: Computer Networks (MA)	PMSCS 678: Embedded System Engineering (ASMMR)	PMSCS 687 Internet-of-Things and Sensor Networks (EI)	PMSCS 682: Digital Forensics (ASMMR)
CSE-302	PMSCS 661: Mobile Application Development (EI)	PMSCS 689: Network Programming (BA)	PMSCS 656: Artificial Intelligence and Expert System (MA)	PMSCS 688: Natural Language Processing (MAI)
CSE-105	PMSCS 603: Discrete Mathematics (SB)		PMSCS 672: Neuroinformatics (SB)	PMSCS 673: Bioinformatics (BA)

**Note: This is just a sample**

Link: <https://juniv.edu/discussion/13895>

## **Let's Begin Our Journey to Crack JU PMSCS Admission Test**

We have seen that PMSCS mostly follows MCQ based on CSE major Subjects. Almost 80% mcq comes from CSE and ICT related subjects. Rest 20% includes mathematics, analytical and English. Some mathematics from differential calculus which is tough to answer. Some math from JSC, SSC, HSC general math book which is not that tough. English includes mostly prepositions and right form of verb which is also quite easy. So, you should focus on CSE based subjects MCQ as much as possible.

There are few subjects which is most popular for this admission test and it has seen that these topics are touched much more than other subjects. These Subjects/ Topics are:

1. Computer Network
2. Programming
3. Database
4. Statistics and Probability
5. Math from series
6. Basic CSE relevant interview questions

So, you should have a clear and broad knowledge of these subjects/Topics.

It has seen that previous years questions are not repeating nowadays (After 2021). That's why only reading and learning previous years question answer is not enough. Everyone should contact my page and join google classroom to learn the latest updated topics. Because the pattern changes frequently and I, always try to keep myself updated with current situations.

They usually provide two sets of question paper colored differently and You just need to tick the correct answer. There is no negative marking (so far). Earlier the questions used to be hard enough and that's why students obtaining 50% mark used to get chance. Recently we have seen that the questions are bit easy and that's why the percentage may get high. So you should keep a target to obtain more than 30 mark out of 50. There are some tricks and tips to correct mcq. You should also apply this. To learn these tricks, watch my video.

[https://youtu.be/zJth9N\\_FvfY](https://youtu.be/zJth9N_FvfY)

# Programming

1. Who developed C language?

- a) Dennis Ritchie
- b) Alan Kay
- c) Robert Lue
- d) James Gasoline

2. A pointer is .....

- a) address of a variable
- b) a variable for storing address
- c) data type of an address variable
- d) indication of the variable to be accessed next

3. By the process of linking, the resulting code is called

as \_\_\_\_\_

- a) Executable code
- b) Optional Code
- c) Link Code
- d) None

4. In the \_\_\_ structure, the logical expression is checked first.

- a) While-loop
- b) For loop
- c) Do while loop
- d) None

5. How many values can be returned from a function?

- a) 1
- b) 2
- c) 3
- d) 4

6. A relational operator.....

- a) assigns operand to another
- b) yields a Boolean result
- c) logically combines two operands
- d) compares two operands

7. The keyword used to transfer control from a function back to the calling function is

- a) switch
- b) goto
- c) go back
- d) return

8. Global variables are

- a) Internal
- b) External
- c) Both internal and external
- d) None of the above

9. Which of the following is a storage specifier?

- a) enum
- b) union
- c) auto
- d) volatile

10. The default parameter passing mechanism is

- a) Call by values
- b) Call by reference
- c) Call by value result
- d) None of these

11. Address stored in pointer variable is of..... type

- a) Integer
- b) Float
- c) Char
- d) Array

12. What is the size of c union?

- a) C union is always 128 bytes
- b) Size of the union is the total bytes of all elements of structure.
- c) Size of the union is the size of largest element
- d) None of the above

13. A pointer is

- a) A keyword used to create variables
- b) A variable that stores address of an instruction
- c) A variable that stores address of another variable
- d) All of the above.

14. Which header file should be included to use function like malloc() and calloc()?

- a) memory.h
- b) stdlib.h
- c) dos.h
- d) string.h

15. FILE is of ..... type

- a) int type
- b) char \* type
- c) struct type
- d) None of the above

16. A mode which is used to open an existing file for both reading and writing is

- a) W
- b) W+
- c) A+
- d) R+

17. Select a function which is used to write a string to a file

- a) puts()
- b) putc()
- c) fputs()
- d) fgets()

- 18. Select a function which is used to read a single character from a file at a time?**
- a) fscanf()
  - b) getch()
  - c) **fgetc()**
  - d) fgets()
- 19. Select a function which is used as a formatted output file function**
- a) printf()
  - b) **fprintf()**
  - c) puts()
  - d) fputs()
- 20. The data type of file pointer is**
- a) int
  - b) double
  - c) void
  - d) **FILE**
- 21. If there is an error while opening a file, fopen will return**
- a) nothing
  - b) EOF
  - c) **NULL**
  - d) Depend on compiler
- 22. getc() returns End of file when**
- a) getc() fails to read the character
  - b) end of file is reached
  - c) **both a and b**
  - d) none of the above
- 23. Specify the two library functions that dynamically allocates memory.**
- a) malloc() and memalloc()
  - b) mllloc() and memalloc()
  - c) **malloc() and calloc()**
  - d) memalloc() and faralloc()
- 24. Which is not the selective control flow statement?**
- a) **while**
  - b) if
  - c) Switch-case
  - d) if-else
- 25. strcmp() function is used for .....**
- a) Copy two strings
  - b) **Compare two strings.**
  - c) Concatenation of two strings
  - d) None of these
- 26. Which function is related to dynamic memory allocation?**
- a) malloc()
  - b) calloc()
  - c) realloc()
  - d) **All of above.**
- 27. In the call by reference we pass .....**
- a) Value of the variable
  - b) **Address of variable**
  - c) Both value and address
  - d) None of these
- 28. A pointer variable can store .....**
- a) Constant value
  - b) Value of another variable.
  - c) **Address of another variable**
  - d) None of these.
- 29. Which of the following is input function?**
- a) gets();
  - b) getch();
  - c) getchar();
  - d) **All of the above**
- 30. Which is not the output function?**
- a) puts();
  - b) putchar();
  - c) putch();
  - d) **None of the above**
- 31. Array index is always starting from?**
- a) **0**
  - b) 1
  - c) 2
  - d) 3
- 32. Which is not the c keyword?**
- a) typedef
  - b) extern
  - c) register
  - d) **local**
- 33. Uninitialized variable may have?**
- a) **Garbage value.**
  - b) Cannot be zero
  - c) Both
  - d) None of these.
- 34. C has ..... keywords:**
- a) 30
  - b) 31
  - c) **32**
  - d) 33
- 35. What is the only language that a computer understands directly?**
- a) English
  - b) BASIC
  - c) **machine language**
  - d) Assembly Language

- 36. Functions used in programs that are defined by programmers are called?**
- a) program layout
  - b) program procedure
  - c) built-in functions
  - d) user-defined function
- 37. An assembler translates**
- a) machine code into assembly code
  - b) assembly code into machine code
  - c) processing time into manual time
  - d) routine into subroutine
- 38. Variable which uses same name in whole program and in its all routines thus best classified as**
- a) middle variable
  - b) default variable
  - c) local variable
  - d) global variable
- 39. If the function returns no value then it is called \_\_\_\_\_**
- a) Data type function
  - b) Calling function
  - c) Main function
  - d) Void function
- 40. Technique of using fixed words for machine code functions is classified as**
- a) mnemonics
  - b) mechanics
  - c) compiler
  - d) translator
- 41. 'object program' is also called?**
- a) program code
  - b) machine code
  - c) assembler
  - d) compiler
- 42. Data structure in which all elements have similar name is considered as**
- a) string structure
  - b) positive structure
  - c) array
  - d) data structure
- 43. Translation of assembly language into machine code is a task of**
- a) assembler
  - b) programmer
  - c) analysts
  - d) financer
- 44. Which character is used to indicate the end of the string?**
- a) Any alphabet
  - b) A
  - c) Null
  - d) None of these
- 45. Which of the following input function cannot be used to input multiword string in a single function call?**
- a) getche()
  - b) gets()
  - c) scanf()
  - d) None of above
- 46. C is \_\_\_\_\_ type of programming language?**
- a) Object Oriented
  - b) Procedural
  - c) Bit level language
  - d) Functional
- 47. C language was invented in which laboratories?**
- a) Uniliver Labs
  - b) IBM Labs
  - c) AT&T Bell Labs
  - d) Verizon Labs
- 48. C language was invented to develop which Operating System?**
- a) Android
  - b) Linux
  - c) Ubuntu
  - d) Unix
- 49. Operator % in C Language is called?**
- a) Percentage Operator
  - b) Quotient Operator
  - c) Modulus
  - d) Division
- 50. Which of the following are tokens in C?**
- a) Keywords
  - b) Variables
  - c) Constants
  - d) All of the above
- 51. What is the valid range of numbers for int type of data?**
- a) 0 to 256
  - b) -32768 to +32767
  - c) -65536 to +65536
  - d) No specific range
- 52. Character constants should be enclosed between \_\_\_\_\_**
- a) Single quotes
  - b) Double quotes
  - c) Both a and b
  - d) None of these
- 53. String constants should be enclosed between \_\_\_\_\_**
- a) Single quotes
  - b) Double quotes
  - c) Both a and b
  - d) None of these

- 54. The operator `&&` is an example for \_\_\_\_ operator.**
- a) Assignment
  - b) Increment
  - c) Logical
  - d) Rational
- 55. The operator `&` is used for**
- a) Bitwise AND
  - b) Bitwise OR
  - c) Logical AND
  - d) Logical OR
- 56. Which of the following is a ternary operator?**
- a) `?:`
  - b) `*`
  - c) `sizeof`
  - d) `^`
- 57. The `printf()` function returns which value when an error occurs?**
- a) Positive value
  - b) Zero
  - c) Negative value
  - d) None of these
- 58. Null character is represented by**
- a) `\n`
  - b) `\0`
  - c) `\o`
  - d) None
- 59. Which among the following is an unconditional control structure?**
- a) do-while
  - b) if-else
  - c) goto
  - d) for
- 60. Continue statement is used**
- a) to go to the next iteration in a loop
  - b) come out of a loop
  - c) exit and return to the main function
  - d) Compile-time
- 61. Which of the following is a keyword used for a storage class?**
- a) `printf`
  - b) `external`
  - c) `auto`
  - d) `scanf`
- 62. The \_\_\_\_\_ chars have values from -128 to 127.**
- a) `signed`
  - b) `unsigned`
  - c) long
  - d) none
- 63. C supports the \_\_\_\_\_ statement to branch unconditionally from one point to another in the program.**
- a) continue
  - b) `goto`
  - c) break
  - d) for
- 64. A program which interprets each line of high-level program at time of execution is called**
- a) instructor
  - b) `interpreter`
  - c) translator
  - d) executor
- 65. All syntax errors are known as \_\_\_\_\_ errors.**
- a) Run-time
  - b) Exception
  - c) Logical
  - d) `Compile-time`
- 66. “Use of undeclared variables” is the \_\_\_\_\_ type of error.**
- a) Logical
  - b) Exception
  - c) Run-time
  - a) `Compile-time`
  - b) `Run-time`
  - c) Logical
  - d) Exception
- 67. “Divided an integer by zero” is the example of \_\_\_\_\_ type of error.**
- 68. Which of the following is true about static variable?**
- a) It can be called from another function
  - b) It exists even after the function ends.
  - c) It can be modified in another function by sending it as a parameter.
  - d) All of the above
- 69. A pointer to a pointer is a form of**
- a) multiple indirections
  - b) a chain of pointers
  - c) both a and b
  - d) None of these

**70. Which of the following is an example of compounded assignment statement?**

- a) a=5
- b) **a+=5**
- c) a=b=c
- d) a=b

**71. An array element is accessed using**

- a) member name
- b) **an index number**
- c) dot operator
- d) a first in first out approach

**72. Choose correct statement about Functions in c language**

- a) A function is a group of statement which can be reused any number of times.
- b) Every function has a return value
- c) Every function may not return a value.
- d) **All of the above**

**73. Choose correct statement about Functions in c language**

- a) A function name cannot be same as a predefined c keyword.
- b) A function name can start with an underscore.
- c) Default return type of any function is an integer.
- d) **All of the above**

**74. Choose the correct statement about c language pass by value.**

- a) Pass by value copies the variable value in one more memory location
- b) Pass by value does not use pointers
- c) Pass by value protect your source variable from changes in outside functions.
- d) **All of the above**

**75. Which of the following cannot be static in C?**

- a) Variable
- b) Functions
- c) Structures
- d) **None of the above**

**76. Choose the correct statement about c structures.**

- a) Structure elements can be initialized at the time of declaration.
- b) **Structure elements cannot be initialized at the time of declaration.**
- c) Only integer members of the structure can be initialized at the time of declaration
- d) None of the above

**77. What is the size of c structure?**

- a) C structure is always 128 bytes
- b) **Size of the structure is the total bytes of all elements of structure.**
- c) Size of the structure is the size of largest element
- d) None of the above

**78. Choose the correct statement about c structure elements**

- a) Structure elements are stored on random free memory locations
- b) Structure elements are stored on register memory location
- c) **Structure elements are stored in contiguous memory locations.**
- d) None of the above.

**79. What is actually passed if you pass a structure variable to a function?**

- a) **Copy of structure variable**
- b) Reference of structure variable
- c) Starting address of structure variable
- d) Ending address of structure variable

**80. User defined data type can be derived by**

- a) struct
- b) enum
- c) typedef
- d) **All of the above**

**81. What is the main difference between structure and union?**

- a) There is no difference
- b) **Union takes less memory**
- c) Union is faster
- d) Structure is faster

**82. The reason for using pointers in c program is**

- a) Pointers allow different functions to share and modify their local variable
- b) To pass large structures so that complete copy of the structure can be avoided
- c) Pointers enable complex linked data structures
- d) **All of the above**

**83. How will you free the allocated space?**

- a) remove(variable-name)
- b) **free(variable-name)**
- c) delete(variable-name)
- d) dealloc(variable-name)

**84. What is the need of closing a file in c language?**

- a) fclose(fp) close a file to release the memory used in opening a file.
- b) closing a file clears buffer contents from RAM or memory
- c) unclosed files occupy memory and PC hangs when on low memory
- d) **all of the above**

**85. Which is the incorrect statement?**

- a) An array is the collection of variables.
- b) All array variables have same type.
- c) Array variables can be used individually.
- d) **None of these.**

**86. Which statement is wrong?**

- a) A function may have arguments.
- b) A function may return value.
- c) A function can be invoked many times in a single program.
- d) Function cannot be reused.

**87. Which is the incorrect statement?**

- a) Variable name can contain underscore.
- b) Variable name may start from digit.
- c) Variable name may not have white space character.
- d) Keyword can not be a variable name.

**88. Operators have precedence. Precedence determines which operator is.....**

- a) faster
- b) takes less memory
- c) evaluated first
- d) takes no arguments

**89. p++ executes faster than p+1 because**

- a) p uses registers
- b) p++ is a single instruction
- c) ++ is faster than +
- d) None of these

**90. What is the answer of: 7%3**

- a) 2.5
- b) 1
- c) 2
- d) 3

**91. Which keyword is used to prevent any changes in the variable within a C program?**

- a) immutable
- b) mutable
- c) const
- d) volatile

**92. What is #include <stdio.h>**

- a) Preprocessor directive
- b) Inclusion directive
- c) File inclusion directive
- d) None of the mentioned

**100. What is used as a terminator in C?**

- a) ?
- b) ;
- c) :
- d) \_

**93. Why do variable names beginning with the underscore is not encouraged?**

- a) It is not standardized
- b) To avoid conflicts since assemblers and loaders use such names
- c) To avoid conflicts since library routines use such names
- d) To avoid conflicts with environment variables of an operating system

**94. Why is a macro used in place of a function?**

- a) It reduces execution time.
- b) It reduces code size.
- c) It increases execution time.
- d) It increases code size.

**95. Which one of the following is a loop construct that will always be executed once at least?**

- a) for
- b) while
- c) switch
- d) do while

**96. The ..... is an alternative for simple if-else statement?**

- a) Conditional operator
- b) Bitwise operator
- c) Logical operator
- d) None

**97. A compiler compiles the source code\_\_\_\_\_.**

- a) complete program in one stroke.
- b) one line at a time.
- c) two lines at a time.
- d) complete programs in two strokes.

**98. \_\_\_\_\_ decides which operator is to be used first.**

- a) Hierarchy.
- b) Priority.
- c) ladder.
- d) Precedence.

**99. If the size of the array is less than the number of initializers then .....**

- a) Extra values are being ignored
- b) Generates an error message
- c) Size of Array is increased
- d) Size is neglected when values are given

## Object Oriented Programming

1. Which of the these is the functionality of ‘Encapsulation’?
  - a) Binds together code and data
  - b) Using single interface for general class of actions.
  - c) Reduce Complexity
  - d) All of the mentioned
2. What is ‘Basis of Encapsulation’?
  - a) object
  - b) class
  - c) method
  - d) all of the mentioned
3. How will a class protect the code inside it?
  - a) Using Access specifiers
  - b) Abstraction
  - c) Use of Inheritance
  - d) All of the mentioned
4. Which of the following is a mechanism by which object acquires the properties of another object?
  - a) Encapsulation
  - b) Abstraction
  - c) Inheritance
  - d) Polymorphism
5. Which of the following supports the concept of hierarchical classification?
  - a) Polymorphism
  - b) Encapsulation
  - c) Abstraction
  - d) Inheritance
6. Which of the following concept is often expressed by the phrase, ‘One interface, multiple methods’?
  - a) Abstraction
  - b) Polymorphism
  - c) Inheritance
  - d) Encapsulation
7. Who developed object-oriented programming?
  - a) Adele Goldberg
  - b) Dennis Ritchie
  - c) Alan Kay
  - d) Andrea Ferro
8. In C++, a function contained within a class is called
  - a) a method
  - b) a class function
  - c) member function
  - d) none of these
9. Which of the following is not an OOPS concept?
  - a) Encapsulation
  - b) Polymorphism
  - c) Exception
  - d) Abstraction
10. Which feature of OOPS described the reusability of code?
  - a) Abstraction
  - b) Encapsulation
  - c) Polymorphism
  - d) Inheritance
11. Which feature of OOPS derives the class from another class?
  - a) Inheritance
  - b) Data hiding
  - c) Encapsulation
  - d) Polymorphism
12. Which operator from the following can be used to illustrate the feature of polymorphism?
  - a) Overloading <<
  - b) Overloading &&
  - c) Overloading ||
  - d) Overloading +=
13. Which operator overloads using the friend function?
  - a) \*
  - b) ()
  - c) ->
  - d) =
14. Which of the following definition is incorrect for polymorphism?
  - a) Polymorphism helps in redefining the same functionality
  - b) Polymorphism concept is the feature of object-oriented programming (OOP)
  - c) It always increases the overhead of function definition
  - d) Ease in the readability of the program
15. Which among the following cannot be used for the concept of polymorphism?
  - a) Static member function
  - b) Constructor Overloading
  - c) Member function overloading
  - d) Global member function

- 16. Which function best describe the concept of polymorphism in programming languages?**
- a) Class member function
  - b) **Virtual function**
  - c) Inline function
  - d) Undefined function
- 17. ..... is not a member of the class?**
- a) Virtual function
  - b) const function
  - c) Static function
  - d) **Friend function**
- 18. Which member function is assumed to call first when there is a case of using function overloading or abstract class?**
- a) Global function
  - b) Local function
  - c) Function with lowest priority
  - d) **Function with the highest priority**
- 19. What is the extra feature in classes which was not in the structures?**
- a) **Member functions**
  - b) Data members
  - c) Public access specifier
  - d) Static Data allowed
- 20. Which of the following feature is also known as run-time binding or late binding?**
- a) Dynamic typing
  - b) Dynamic loading
  - c) **Dynamic binding**
  - d) Data hiding
- 21. Which of the following OOP concept binds the code and data together and keeps them secure from the outside world?**
- a) Polymorphism
  - b) Inheritance
  - c) Abstraction
  - d) **Encapsulation**
- 22. Which member of the superclass is never accessible to the subclass?**
- a) Public member
  - b) Protected member
  - c) **Private member**
  - d) All of the mentioned
- 23. Which class cannot create its instance?**
- a) Parent class
  - b) Nested class
  - c) Anonymous class
  - d) **Abstract class**
- 24. Which of the following variable violates the definition of encapsulation?**
- a) Array variables
  - b) Local variables
  - c) **Global variables**
  - d) Public variables
- 25. The object cannot be\_\_\_\_\_**
- a) passed by copy
  - b) **passed as function**
  - c) passed by value
  - d) passed by reference
- 26. Which among the following feature does not come under the concept of OOPS?**
- a) Data binding
  - b) Data hiding
  - c) **Platform independent**
  - d) Message passing
- 27. Which of the following feature interacts one object with another object?**
- a) Message reading
  - b) **Message passing**
  - c) Data transfer
  - d) Data binding
- 28. Which definition best defines the concept of abstraction?**
- a) Hides the important data
  - b) **Hides the implementation and showing only the features**
  - c) Hiding the implementation
  - d) Showing the important data
- 29. The combination of abstraction of the data and code is viewed in\_\_\_\_\_.**
- a) Inheritance
  - b) **Object**
  - c) Class
  - d) Interfaces
- 30. The principle of abstraction\_\_\_\_\_**
- a) is used to achieve OOPS.
  - b) **is used to avoid duplication**
  - c) Use abstraction at its minimum
  - d) is used to remove longer codes
- 31. To convert from a user-defined class to a basic type, you would most likely use**
- a) **an overloaded = operator**
  - b) a one-argument constructor
  - c) a built-in conversion operator
  - d) a conversion operator that's a member of the class
- 32. The main function of scope resolution operator (::) is**
- a) To define an object
  - b) **To define a data member**
  - c) To link the definition of an identifier to its declaration
  - d) All of the given

33. Which of the following operators always takes no argument if overloaded?
- a) **++**
  - b) /
  - c) —
  - d) +
34. The keyword that is used that the variable cannot change state?
- a) static
  - b) friend
  - c) **private**
  - d) **const**
35. In OOP a class is an example of
- a) Data Type
  - b) both a & d
  - c) **User Defined Type**
  - d) Abstract Type
36. Which operator cannot be overloaded?
- a) The relation operator ( $\geq$ )
  - b) **Conditional operator (? : )**
  - c) Script operator ( [ ] )
  - d) Assignment operator (=)
37. A static member function cannot be declared
- a) Explicit
  - b) **Implicit**
  - c) Static
  - d) Virtual
38. We can get only one unique value which can be used by all the objects of that class by the use of
- a) instance variables
  - b) dynamic variables
  - c) **static variables**
  - d) data members
39. Friend functions are \_\_\_\_\_ functions of a class
- a) object member
  - b) **non-member**
  - c) data member
  - d) None of these
40. \_\_\_\_\_ remain in memory even when all objects of a class have been destroyed
- a) Primitive variables
  - b) Instance variable
  - c) **Static variables**
  - d) None of these
41. The return type of a constructor is of
- a) Integer
  - b) **No type**
  - c) Double
  - d) Character
42. Which one of the following terms must relate to polymorphism?
- a) Dynamic allocation
  - b) Static typing
  - c) Static allocation
  - d) **Dynamic binding**
43. Which one is not a class association?
- a) Composition
  - b) **Inheritance**
  - c) Simple Association
  - d) Aggregation
44. When a variable is defined as static in a class then all object of this class
- a) Have different copies of this variable
  - b) **Have same copy of this variable**
  - c) Cannot access this variable
  - d) None of these
45. When the base class and the derived class have a member function with the same name, you must be more specific which function you want to call using \_\_\_\_\_
- a) Operator overloading
  - b) **null operator**
  - c) scope resolution operator
  - d) dot operator
46. The compiler won't object if you overload the \* operator to perform division
- a) **True**
  - b) False
47. Default constructor is such constructor which either has no\_\_\_\_\_ or if it has some parameters these have\_\_\_\_\_ values
- a) Parameter, default
  - b) Null, Parameter
  - c) Parameter, temporary
  - d) None of these
48. Outside world can access only \_\_\_\_\_ members of a class using its object
- a) **Public**
  - b) Private
  - c) Protected
  - d) No member is accessible
49. A copy constructor is invoked when
- a) an argument is passed by reference
  - b) an argument is passed by value
  - c) **a function returns by reference**
  - d) a function do not returns by value

50. \_\_\_\_\_ Operator will take only one operand

- a) New
- b) int
- c) object
- d) None of these

51. Class is \_\_\_\_\_ abstraction.

- a) Object
- b) Logical
- c) Real
- d) Hypothetical

52. When is a constructor called?

- a) Each time the constructor identifier is used in a program statement
- b) During the instantiation of a new object
- c) During the construction of a new class
- d) At the beginning of any program execution

53. \_\_\_\_\_ is automatically called when the object is created

- a) member function
- b) object
- c) constructor
- d) None of these

54. Which of the following operators cannot be overloaded?

- a) Scope resolution operator ( :: )
- b) Insertion operator ( << )
- c) Extraction operator ( >> )
- d) The relation operator ( > )

55. Which of the following best defines a class?

- a) Parent of an object
- b) Instance of an object
- c) Blueprint of an object
- d) Scope of an object

56. Which header file is required in C++ to use OOP?

- a) iostream.h
- b) stdio.h
- c) stdlib.h
- d) OOP can be used without using any header file

57. Object is \_\_\_\_\_ abstraction.

- a) Object
- b) Logical
- c) Real
- d) Hypothetical

58. Which definition best describes an object?

- a) Instance of a class
- b) Instance of itself
- c) Child of a class
- d) Overview of a class

59. The object can't be \_\_\_\_\_

- a) Passed by reference
- b) Passed by value
- c) Passed by copy
- d) Passed as function

60. How members of an object are accessed?

- a) Using dot operator/period symbol
- b) Using scope resolution operator
- c) Using member names directly
- d) Using pointer only

61. Object declared in main() function \_\_\_\_\_

- a) Can be used by any other function
- b) Can be used by main() function of any other program
- c) Can't be used by any other function
- d) Can be accessed using scope resolution operator

62. Which of the following option leads to the portability and security of Java?

- a) Bytecode is executed by JVM
- b) The applet makes the Java code secure and portable
- c) Use of exception handling
- d) Dynamic binding between objects

63. Which of the following is not a Java features?

- a) Dynamic
- b) Architecture Neutral
- c) Use of pointers
- d) Object-oriented

64. \_\_\_\_\_ is used to find and fix bugs in the Java programs.

- a) JVM
- b) JRE
- c) JDK
- d) JDB

65. Which package contains the Random class?

- a) java.util package
- b) java.lang package
- c) java.awt package
- d) java.io package

66. What do you mean by nameless objects?

- a) An object created by using the new keyword.
- b) An object of a superclass created in the subclass.
- c) An object without having any name but having a reference.
- d) An object that has no reference.

67. Which option is false about the final keyword?

- a) A final method cannot be overridden in its subclasses.
- b) A final class cannot be extended.
- c) A final class cannot extend other classes.
- d) A final method can be inherited.

**68. Which two features of object-oriented programming are the same?**

- a. Abstraction and Polymorphism features are the same
- b. Inheritance and Encapsulation features are the same
- c. Encapsulation and Polymorphism features are the same
- d. Encapsulation and Abstraction

**69. How can the concept of encapsulation be achieved in the program?**

- a. By using the Access specifiers
- b. By using the concept of Abstraction
- c. By using only private members
- d. By using the concept of Inheritance

**70. Size of a class is \_\_\_\_\_**

- a) Sum of the size of all the variables declared inside the class
- b) Sum of the size of all the variables along with inherited variables in the class
- c) Size of the largest size of variable
- d) Classes doesn't have any size

**71. Which of the following is the functionality of 'Data Abstraction'?**

- a) Reduce Complexity
- b) Binds together code and data
- c) Parallelism
- d) None of the mentioned

**72. What do you mean by chained exceptions in Java?**

- a) Exceptions occurred by the VirtualMachineError
- b) An exception caused by other exceptions
- c) Exceptions occur in chains with discarding the debugging information
- d) None of the above

**73. Who invented Java Programming?**

- a) Guido van Rossum
- b) James Gosling
- c) Dennis Ritchie
- d) Bjarne Stroustrup

**81. Which Keyword from the following is used to inherit properties from one class into another?**

- a) extends
- b) subclasses
- c) native
- d) all of the mentioned

**74. Which statement is true about Java?**

- a) Java is a sequence-dependent programming language
- b) Java is a code dependent programming language
- c) Java is a platform-dependent programming language
- d) Java is a platform independent programming language

**75. Which component is used to compile, debug and execute the java programs?**

- a) JRE
- b) JIT
- c) JDK
- d) JVM

**76. Which environment variable is used to set the java path?**

- a) MAVEN\_HOME
- b) CLASSPATH
- c) JAVA
- d) JAVA\_HOME

**77. What is the extension of compiled java classes?**

- a) .txt
- b) .js
- c) .class
- d) .java

**78. Which exception is thrown when java is out of memory?**

- a) MemoryError
- b) OutOfMemoryError
- c) MemoryOutOfBoundsException
- d) MemoryFullException

**79. Which of these keywords can be used to prevent Method overriding in Java?**

- a) final
- b) protected
- c) static
- d) constant

**80. Which provides runtime environment for java byte code to be executed?**

- a) AJDK
- b) JVM
- c) CJRE
- d) DJAVAC

**82. Usually a pure virtual function**

- a) has complete function body.
- b) will never be called.
- c) will be called only to delete an object.
- d) is defined only in derived class.

83. Java is developed by \_\_\_\_\_  
a) Sun Microsystems of USA  
b) Microsoft  
c) c)Adobe  
d) None
84. \_\_\_\_\_ is one of the java features that can handle multiple tasks simultaneously.  
a) Object-Oriented  
b) Dynamic & Extensible  
c) c)Platform-Independent  
d) Multithreaded
85. Java compiler translates source code into \_\_\_\_\_  
a) Bytecode (Virtual Machine Code)  
b) Bitcode  
c) Machine Code  
d) User code
86. Java interpreter translates \_\_\_\_\_ into machine code.  
a) Bitcode  
b) Bytecode (Virtual Machine Code)  
c) Machine Code  
d) User code
87. In java \_\_\_\_\_ tool helps us to find errors in our programs.  
a) jhelp  
b) javah  
c) javap  
d) jdb
88. The \_\_\_\_\_ includes hundreds of classes and methods grouped into several function packages.  
a) API  
b) JVM  
c) JAVAC  
d) JRE
89. The process of converting one date type to another is called \_\_\_\_\_  
a) Translating  
b) Casting  
c) Compiling  
d) Declaring
90. Java does not support \_\_\_\_\_.  
a) Operator overloading  
b) Global variable  
c) Multiple inheritance  
d) All of above
91. Which of the following statements is true?  
a) Java supports operator overloading  
b) Java supports interfaces  
c) Java supports pointers  
d) Java supports multiple inheritance
92. What keyword is used in Java to define a constant?  
a) static  
b) final  
c) abstract  
d) private
93. If two methods have same name but different parameter list then it is called \_\_\_\_\_.  
a) Method overriding  
b) Method overloading  
c) Operator overloading  
d) None of these
94. \_\_\_\_\_ keyword does not allow a method to be override in the subclass.  
a) public  
b) abstract  
c) final  
d) static
95. \_\_\_\_\_ is caused when a conversion between string and number fails.  
a) NullPointerException  
b) NumberFormatException  
c) IOException  
d) SecurityException
96. \_\_\_\_\_ is caused by bad array indexes.  
a) ArrayStoreException  
b) ArithmeticException  
c) IOException  
d) ArrayIndexOutOfBoundsException
97. In multilevel inheritance, which is the most significant feature of OOP used?  
a) Code efficiency  
b) Code readability  
c) Flexibility  
d) Code reusability
98. The copy constructors can be used to \_\_\_\_\_.  
a) Copy an object so that it can be passed to another primitive type variable  
b) Copy an object for type casting  
c) Copy an object so that it can be passed to a function  
d) Copy an object so that it can be passed to a class
99. What happens when an object is passed by reference?  
a) Destructor is called at end of function  
b) Destructor is called when called explicitly  
c) Destructor is not called  
d) Destructor is called when function is out of scope
100. Which feature of OOP is exhibited by the function overriding?  
a) Polymorphism  
b) Encapsulation  
c) Abstraction  
d) Inheritance

**101. If class C inherits class B. And B has inherited class**

**A. Then while creating the object of class C, what will be the sequence of constructors getting called?**

- a) Constructor of C then B, finally of A
- b) Constructor of A then C, finally of B
- c) Constructor of C then A, finally B
- d) Constructor of A then B, finally C**

**102. Which among the following is true for copy constructor?**

- a) The argument object is passed by reference
- b) It can be defined with zero arguments**
- c) Used when an object is passed by value to a function
- d) Used when a function returns an object

**103. Java Virtual Machine**

- a) Acts as a full-fledged hypervisor
- b) Converts byte codes to Operating System dependent code
- c) Is known as the Compiler of Java programming language
- d) Manages system memory and provides a portable execution environment for Java-based applications**

**104. Which of the following is not an object-oriented programming language?**

- a) Pascal**
- b) JAVA
- c) C++
- d) None

**105. Which was the first purely object-oriented programming language developed?**

- a) SmallTalk**
- b) JAVA
- c) C++
- d) None

**106. How to overcome diamond problem?**

- a) Using virtual keyword with same name function**
- b) Using friend function
- c) Using Static Keyword
- d) None

**107. What happens if non static members are used in static member function?**

- a) Compile time error**
- b) Run time error
- c) Runs successfully
- d) None

**108. Where is the memory allocated for the objects?**

- a) RAM**
- b) ROM
- c) No Allocation
- d) None

**109. Which feature of OOP is exhibited by the function overriding?**

- a) Polymorphism**
- b) Abstraction
- c) Inheritance
- d) None

**110. Instance of which type of class can't be created?**

- a) Abstract class**
- b) Virtual class
- c) New class
- d) None

**111. Which feature in OOP is used to allocate additional functions to a predefined operator in any language?**

- a) Operator Overloading**
- b) Function Overloading
- c) Function Overriding
- d) None

**112. Which among the following is false?**

- a) Object must be created before using members of a class
- b) Memory for an object is allocated only after its constructor is called
- c) Objects can't be passed by reference**
- d) Objects size depends on its class data member

The screenshot shows a C IDE interface with two windows. The left window is titled "Testing.c" and contains the following C code:1 #include <stdio.h>
2 int main() {
3 int a[] = {1, 2, 3, 4, 5};
4 int sum = 0;
5 for(int i = 0; i < 5; i++) {
6 sum += a[i];
7 }
8 printf("%d", sum);
9 return 0;
10 }The right window is a terminal window titled "C:\Users\ISMI Johura\Desktop\Testing.exe" showing the output of the program:15
Process returned 0 (0x0) execution time : 0.033 s
Press any key to continue.

The screenshot shows a C IDE interface with two windows. The left window is titled "Testing.c" and contains the following C code:1 #include <stdio.h>
2 void solve() {
3 int a[] = {1, 2, 3, 4,};
4 int sum = 0;
5 for(int i = 0; i < 5; i++) {
6 if(i % 2 == 0) {
7 sum += \*(a + i);
8 }
9 else {
10 sum -= \*(a + i);
11 }
12 }
13 printf("%d", sum);
14 }
15 int main() {
16 solve();
17 return 0;
18 }The right window is a terminal window titled "C:\Users\ISMI Johura\Desktop\Testing.exe" showing the output of the program:-2
Process returned 0 (0x0) execution time : 0.034 s
Press any key to continue.

The screenshot shows a C IDE interface with two windows. The left window is titled "Testing.c" and contains the following C code:1 #include <stdio.h>
2 void solve() {
3 int first = 100, second = 200;
4 int third = first + second;
5 {
6 int third = second - first;
7 printf("%d ", third);
8 }
9 printf("%d", third);
10 }
11 int main() {
12 solve();
13 return 0;
14 }The right window is a terminal window titled "C:\Users\ISMI Johura\Desktop\Testing.exe" showing the output of the program:100 300
Process returned 0 (0x0) execution time : 0.025 s
Press any key to continue.

Start here X Testing.c X

```
1 #include <stdio.h>
2 void solve() {
3     int a = 5;
4     int res = a++ + ++a + a++ + ++a;
5     printf("%d", res);
6 }
7 int main() {
8     solve();
9     return 0;
10}
11
```

"C:\Users\ISMI Johura\Desktop\Testing.exe"

```
28
Process returned 0 (0x0) execution time : 0.036 s
Press any key to continue.
```

Start here X Testing.c X

```
1 #include <stdio.h>
2 void solve() {
3     int x = printf("Father of Admission Test");
4     printf(" %d", x);
5 }
6 int main() {
7     solve();
8     return 0;
9 }
10
```

"C:\Users\ISMI Johura\Desktop\Testing.exe"

```
Father of Admission Test 24
Process returned 0 (0x0) execution time : 0.039 s
Press any key to continue.
```

Start here X Testing.c X

```
1 #include <stdio.h>
2 void swap(int *a, int *b) {
3     int t = *a;
4     *a = *b;
5     *b = t;
6 }
7 void fun() {
8     int a = 5, b = 6;
9     swap(&a, &b);
10    printf("%d %d", a, b);
11 }
12 int main() {
13     fun();
14     return 0;
15 }
```

"C:\Users\ISMI Johura\Desktop\Testing.exe"

```
6 5
Process returned 0 (0x0) execution time : 0.027 s
Press any key to continue.
```

Start here X Testing.c X

```
1 #include <stdio.h>
2 #define VAL 3 * (2 + 6)
3 void fun() {
4     int a = 20 + VAL;
5     printf("%d", a);
6 }
7 int main() {
8     fun();
9     return 0;
10}
```

"C:\Users\ISMI Johura\Desktop\Testing.exe"

```
44
Process returned 0 (0x0) execution time : 0.035 s
Press any key to continue.
```

Start here X Testing.c X

```
1 #include <stdio.h>
2 void solve() {
3     char ch[10] = "abcdefghijklmnopqrstuvwxyz";
4     int ans = 0;
5     for(int i = 0; i < 10; i++) {
6         ans += (ch[i] - 'a');
7     }
8     printf("%d", ans);
9 }
10 int main() {
11     solve();
12     return 0;
13 }
```

"C:\Users\ISMI Johura\Desktop\Testing.exe"

```
45
Process returned 0 (0x0) execution time : 0.037 s
Press any key to continue.
```

Start here X Testing.c X

```
1 #include <stdio.h>
2 #define CUBE(x) x * x * x
3 void solve() {
4     int ans = 6 / CUBE(3);
5     printf("%d", ans);
6 }
7 int main() {
8     solve();
9     return 0;
10}
```

Select "C:\Users\ISMI Johura\Desktop\Testing.exe"

```
18
Process returned 0 (0x0) execution time : 0.034 s
Press any key to continue.
```

```
1 #include <stdio.h>
2 int get(int n) {
3     if(n <= 1) {
4         return n;
5     }
6     return get(n - 1) + get(n - 2);
7 }
8 void solve() {
9     int ans = get(6);
10    printf("%d", ans);
11 }
12 int main() {
13     solve();
14     return 0;
15 }
```

```
8
Process returned 0 (0x0)  execution time : 0.034 s
Press any key to continue.
```

```
Start here X Testing.c X
1 #include <stdio.h>
2 void solve() {
3     int ch = 1;
4     switch(ch) {
5         case 1: printf("1 ");
6         case 2: printf("2 ");
7         case 3: printf("3 ");
8         default: printf("PMSCS");
9     }
10 }
11 int main() {
12     solve();
13     return 0;
14 }
```

```
1 2 3 PMSCS
Process returned 0 (0x0)  execution time : 0.030 s
Press any key to continue.
```

```
Start here X Testing.c X
1 int main()
2 {
3     int i = 2, j=5;
4     {
5         int i = 4, j = 5;
6         printf("%d%d", i, j);
7     }
8     printf(" %d%d", i, j);
9
10 }
11
12 }
```

```
45 25
Process returned 0 (0x0)  execution time : 0.028 s
Press any key to continue.
```

Start here X Testing.c X

```
1 #include <stdio.h>
2     int main()
3     {
4         int *ptr, a = 10;
5         ptr = &a;
6         *ptr += 1;
7         printf("%d %d", *ptr, a++);
8     }
9 
```

Select "C:\Users\ISMI Johura\Desktop\Testing.exe"

```
12 11
Process returned 0 (0x0) execution time : 0.032 s
Press any key to continue.
```

Start here X Testing.c X

```
1 #include <stdio.h>
2     int main()
3     {
4         int a=10, b=20;
5
6         a=a+b;
7         b=a-b;
8         a=a-b;
9         printf("a=%d b=%d", a,b);
10        return 0;
11    }
12 
```

"C:\Users\ISMI Johura\Desktop\Testing.exe"

```
a=20 b=10
Process returned 0 (0x0) execution time : 0.032 s
Press any key to continue.
```

Start here X Testing.c X

```
1 #include <stdlib.h>
2 #include <stdio.h>
3 enum {false, true};
4 int main()
5 {
6     int i = 1;
7     do
8     {
9         printf("%d\n", i);
10        i++;
11        if (i < 15)
12            continue;
13    } while (false);
14
15    getchar();
16    return 0;
17 }
```

"C:\Users\ISMI Johura\De..."

```
1
Process returned 0 (0x0) execution
time : 21.743 s
Press any key to continue.
```

Start here X Testing.c X

```
1 #include<stdio.h>
2 int main()
3 {
4     int n;
5     for(n = 5; n!=0; n++)
6         printf("n = %d", n);
7     getchar();
8     return 0;
9 }
```

C:\Users\ISMI Johura\Desktop\Testing... — X

```
= 57632n = 57633n = 57634n = 57635n = 57636n
= 57637n = 57638n = 57639n = 57640n = 57641n
= 57642n = 57643n = 57644n = 57645n = 57646n
= 57647n = 57648n = 57649n = 57650n = 57651n
= 57652n = 57653
```

Start here X Testing.c X

```
1 #include <stdlib.h>
2 #include <stdio.h>
3 char *getString()
4 {
5     char *str = "Father Mother";
6     return str;
7 }
8
9 int main()
10 {
11     printf("%s", getString());
12     printf("\nSister Brother");
13
14     getchar();
15     return 0;
16 }
```

C:\Users\ISMI Johura\Desktop\Testing.exe — X

```
Father Mother
Sister Brother

Process returned 0 (0x0) execution time : 10.767 s
Press any key to continue.
```

Start here X Testing.c X

```
1 #include<stdio.h>
2 int main()
3 {
4     static int i=10;
5     if(--i){
6         main();
7         printf("%d ",i);
8     }
9 }
```

C:\Users\ISMI Johura\Desktop\Testing.exe — X

```
0 0 0 0 0 0 0 0 0
Process returned 0 (0x0) execution time : 0.030 s
Press any key to continue.
```

The screenshot shows a C IDE interface with a code editor and a terminal window. The code in the editor is:

```
#include <stdio.h>
int main()
{
    int i=0;
    for(i=0; i<10; i++)
    {
        switch(i)
        {
            case 0:
                i+=5;
            case 1:
                i+=2;
            case 5:
                i+=5;
            default:
                i+=4;
                break;
        }
        printf("%d ", i);
    }
    return 0;
}
```

The terminal window shows the output of the program:

```
Select "C:\Users\ISMI Johura\Desktop\Testing.exe"
16
Process returned 0 (0x0) execution time : 0.029 s
Press any key to continue.
```

The screenshot shows a C IDE interface with a code editor and a terminal window. The code in the editor is:

```
#include <stdio.h>
int fun(int n)
{
    int i, j, sum = 0;
    for(i = 1;i<=n;i++)
        for(j=i;j<=i;j++)
            sum=sum+j;
    return(sum);
}

int main()
{
    printf("%d", fun(5));
    return 0;
}
```

The terminal window shows the output of the program:

```
"C:\Users\ISMI Johura\Desktop\Testing.exe"
15
Process returned 0 (0x0) execution time : 0.026 s
Press any key to continue.
```

The screenshot shows a C IDE interface with a code editor and a terminal window. The code in the editor is:

```
#include<stdio.h>
int main()
{
    typedef int *i;
    int j = 100;
    i a = &j;
    printf("%d", *a);
    return 0;
}
```

The terminal window shows the output of the program:

```
"C:\Users\ISMI Johura\Desktop\Testing.exe"
100
Process returned 0 (0x0) execution time : 0.025 s
Press any key to continue.
```

The screenshot shows a C IDE interface with a code editor and a terminal window. The code in the editor is:

```
1 void fun(int *p)
2 {
3     static int q = 10;
4     p = &q;
5 }
6
7 int main()
8 {
9     int r = 200;
10    int *p = &r;
11    fun(p);
12    printf("%d", *p);
13    return 0;
14 }
```

The terminal window shows the output of the program:

```
Select "C:\Users\ISMI Johura\Desktop\Testing.exe"
200
Process returned 0 (0x0) execution time : 0.046 s
Press any key to continue.
```

The screenshot shows a C IDE interface with a code editor and a terminal window. The code in the editor is:

```
1 void fun(int **p)
2 {
3     static int q = 100;
4     *p = &q;
5 }
6
7 int main()
8 {
9     int r = 20;
10    int *p = &r;
11    fun(&p);
12    printf("%d", *p);
13    return 0;
14 }
```

The terminal window shows the output of the program:

```
"C:\Users\ISMI Johura\Desktop\Testing.exe"
100
Process returned 0 (0x0) execution time : 0.027 s
Press any key to continue.
```

The screenshot shows a C IDE interface with a code editor and a terminal window. The code in the editor is:

```
1 int main()
2 {
3     int x, y = 5, z = 5;
4     x = y==z;
5     printf("%d", x);
6
7     return 0;
8 }
```

The terminal window shows the output of the program:

```
"C:\Users\ISMI Johura\Desktop\Testing.exe"
1
Process returned 0 (0x0) execution time : 0.033 s
Press any key to continue.
```

The screenshot shows a C IDE interface with a code editor and a terminal window. The code in the editor is:

```
1 #include<stdio.h>
2 int main()
3 {
4     int a = 1;
5     int b = 0;
6     b = ++a + ++a;
7     printf("%d %d", a, b);
8     return 0;
9 }
```

The terminal window shows the output of the program:

```
"C:\Users\ISMI Johura\Desktop\Testing.exe"
3 6
Process returned 0 (0x0) execution time : 0.030 s
Press any key to continue.
```

The screenshot shows a C IDE interface. On the left, the code file `Testing.c` is open, containing the following code:

```
1 #include<stdio.h>
2
3 int main()
4 {
5     int a[] = {1, 2, 3, 4, 5, 6};
6     int *ptr = (int*)(&a+1);
7     printf("%d ", *(ptr-1));
8     return 0;
9 }
10
```

On the right, the terminal window shows the output of the program:

```
C:\Users\ISMI Johura\Desktop\Testing.exe
6
Process returned 0 (0x0) execution time : 0.024 s
Press any key to continue.
```

The screenshot shows a C IDE interface. On the left, the code file `Test.c` is open, containing the following code:

```
1 #include<stdio.h>
2
3 int foat(int n)
4 {
5     if(n==0)
6         return 1;
7     else
8         return 3*foat(n-1);
9 }
10
11 int main()
12 {
13     int n;
14     n=foat(5);
15     printf("%d", n);
16     return 0;
17 }
18
19
20
```

On the right, the terminal window shows the output of the program:

```
C:\Users\Mustakim\Desktop\Test.exe
243
Process returned 0 (0x0) execution time : 1.094 s
Press any key to continue.
```

The screenshot shows a C IDE interface. On the left, the code file `Test.c` is open, containing the following code:

```
1 #include<stdio.h>
2
3 int main()
4 {
5     int n=0;
6     while(n<5)
7     {
8         n++;
9         printf("%d ", n*n);
10    }
11    return 0;
12 }
```

On the right, the terminal window shows the output of the program:

```
C:\Users\Mustakim\Desktop\Test.exe
1 4 9 16 25
Process returned 0 (0x0) execution time : 0.891 s
Press any key to continue.
```

The screenshot shows a C IDE interface. On the left, a code editor window titled "Start here" contains the following C code:

```
1 #include<stdio.h>
2 int main()
3 {
4     int j,m=1,n=2;
5
6     for(j=1;j<=2;j=j+1)
7     {
8         m=m+j;
9         n=n*j;
10        printf("%d \t %d\n\t",m,n);
11    }
12
13
14 }
```

On the right, a terminal window titled "C:\Users\Mustakim\Desktop\New Text Document.exe..." displays the output of the program:

```
2      2      3      4
Process returned 6 (0x6)  execution time : 1.232 s
Press any key to continue.
```

The screenshot shows a C IDE interface. On the left, a code editor window titled "Start here" contains the following C code:

```
1 #include<stdio.h>
2 int main()
3 {
4
5     int b[] = {10,20,30,40,50};
6     int i, *k;
7     k = b;
8
9     for ( i = 0 ; i<=3 ; i++)
10    {
11        printf("%d\t",*k);
12        k++;
13    }
14
15    return 0;
16
17 }
```

On the right, a terminal window titled "Select "C:\Users\Mustakim\Desktop\New Text Docu..." displays the output of the program:

```
10      20      30      40
Process returned 0 (0x0)  execution time : 0.032 s
Press any key to continue.
```

The screenshot shows a C IDE interface. On the left, a code editor window titled "Start here" contains the following C code:

```
1 #include<stdio.h>
2 int main()
3 {
4
5     int a , b = 30;
6     a = b;
7     b = a + 40;
8     a = b % 5;
9     printf("%d %d",a , b);
10
11
12    return 0;
13
14 }
```

On the right, a terminal window titled "C:\Users\Mustakim\Desktop\New Text Document.exe" displays the output of the program:

```
0 70
Process returned 0 (0x0)  execution time : 0.028 s
Press any key to continue.
```

The screenshot shows a C IDE interface. On the left is a code editor titled "Start here" with the file "New Text Document.c". The code is:1 #include<stdio.h>
2
3 int main()
4 {
5 int x , y;
6 x = 2003;
7 x++;
8 y = x++;
9 y = x;
10 y++;
11 printf ("%d \t %d",x,y);
12
13
14
15 return 0;
16 }
17On the right is a terminal window titled "C:\Users\Mustakim\Desktop\New Text Document.exe" showing the output:2005 2006
Process returned 0 (0x0) execution time : 9.994 s
Press any key to continue.

The screenshot shows a C IDE interface. On the left is a code editor titled "Start here" with the file "\*New Text Document.c". The code is:1 #include<stdio.h>
2
3 int main()
4 {
5 int x = 10;
6 while ( x > 1){
7
8 printf("%d\t",x);
9 x=x-1;
10 if(x==5)
11 break;
12
13
14
15 return 0;
16 }
17On the right is a terminal window titled "C:\Users\Mustakim\Desktop\New Text Document..." showing the output:10 9 8 7 6
Process returned 0 (0x0) execution time : 0.034 s
Press any key to continue.

The screenshot shows a C IDE interface. On the left is a code editor titled "Start here" with the file "New Text Document.c". The code is:1 #include<stdio.h>
2
3 int main()
4 {
5
6 int a , x;
7 a = 18;
8 x = a >>1;
9 printf("%d %d",a,x);
10
11
12
13 return 0;
14 }On the right is a terminal window titled "C:\Users\Mustakim\Desktop\New Text Document.exe" showing the output:18 9
Process returned 0 (0x0) execution time : 0.033 s
Press any key to continue.

The screenshot shows a code editor window titled "Start here" with a tab for "New Text Document.c". The code is as follows:

```
1 #include<stdio.h>
2
3 int main()
4 {
5     int i = 10, j = 20;
6     int a,b,c;
7
8     a = j/i;
9     b = i / j ;
10    c = i % j;
11
12    printf("%d %d %d",a,b,c);
13
14
15
16
17    return 0;
18 }
19
```

To the right of the code editor is a terminal window titled "C:\Users\Mustakim\Desktop\New Text Document.exe...". The output is:

```
2 0 10
Process returned 0 (0x0) execution time : 9.989 s
Press any key to continue.
```

The screenshot shows a code editor window titled "Start here" with a tab for "New Text Document.c". The code is as follows:

```
1 #include<stdio.h>
2
3 int main()
4 {
5     int i = 4 , j ;
6     j = ++i * i++;
7     i*=j;
8     printf("%d %d",i,j);
9
10
11
12
13
14    return 0;
15 }
16
```

To the right of the code editor is a terminal window titled "C:\Users\Mustakim\Desktop\New Text Document.exe". The output is:

```
150 25
Process returned 0 (0x0) execution time : 0.033 s
Press any key to continue.
```

The screenshot shows a code editor window titled "Start here" with a tab for "New Text Document.c". The code is as follows:

```
1 #include<stdio.h>
2
3 int main()
4 {
5     int i = 0 , sum = 0 , sum_sq = 0;
6
7     for ( i = 2; i < 10 ; i+=2){
8
9         sum+=i;
10        sum_sq+=i*i;
11
12    }
13
14    printf("Sum is : %d", sum);
15    printf("\nSum of Square is : %d ", sum_sq);
16
17    return 0;
18 }
```

To the right of the code editor is a terminal window titled "C:\Users\Mustakim\Desktop\New Text Document....". The output is:

```
Sum is : 20
Sum of Square is : 120
Process returned 0 (0x0) execution time : 0.056 s
Press any key to continue.
```

The screenshot shows a C IDE interface with two windows. The left window is titled "Start here" and contains the following C code:

```
1 #include<stdio.h>
2
3 int main()
4 {
5     int i = 5;
6     i++;
7     printf("Multiplication is %d", i++ * i++);
8
9
10 return 0;
11 }
```

The right window is a terminal or output window titled "C:\Users\Mustakim\Desktop\New Text Document...". It displays the following output:

```
Multiplication is 36
Process returned 0 (0x0) execution time : 9.991 s
Press any key to continue.
```

The screenshot shows a C IDE interface with two windows. The left window is titled "Start here" and contains the following C code:

```
1 #include<stdio.h>
2
3 int main()
4 {
5     char x[] = "ABCDEFG" , *p;
6     int i = 0;
7     p = x;
8
9     while ( i != 10) {
10         i = i + 2;
11         p++;
12         printf("%c", *p);
13     }
14
15
16
17
18     return 0;
19 }
```

The right window is a terminal or output window titled "C:\Users\Mustakim\Desktop\New Text Document...". It displays the following output:

```
BCDEF
Process returned 0 (0x0) execution time : 0.033 s
Press any key to continue.
```

The screenshot shows a C IDE interface with two windows. The left window is titled "Start here" and contains the following C code:

```
1 #include<stdio.h>
2
3 int main()
4 {
5     int main = 3;
6
7     printf("%d", main);
8
9
10 return 0;
11 }
```

The right window is a terminal or output window titled "Select "C:\Users\Mustakim\Desktop\New Text D...". It displays the following output:

```
3
Process returned 0 (0x0) execution time : 1.073 s
Press any key to continue.
```

```
#include<stdio.h>

int main()
{
    int a[5] = {1, 2, 3, 4, 5};
    int i;

    for (i = 0; i < 5; i++)
        if (a[i] == 5)
            printf("PASS\n");
        else
            printf("FAIL\n");

    return 0;
}
```

FAIL  
FAIL  
FAIL  
FAIL  
PASS  
Process returned 0 (0x0) execution time : 0.542 s  
Press any key to continue.

```
#include<stdio.h>

int main()
{
    int x = 10000;
    double y = 56;
    int *p = &x;
    double *q = &y;

    printf("%d %d %d %d", sizeof(p), sizeof(q), sizeof(*p), sizeof(*q));
}

return 0;
}
```

4 4 4 8  
Process returned 0 (0x0) execution time : 0.693 s  
Press any key to continue.

```
#include<stdio.h>

union Sti
{
    int nu;
    char m;
};

int main()
{
    union Sti s;
    printf("%d", sizeof(s));
}

return 0;
}
```

4  
Process returned 0 (0x0) execution time : 0.705 s  
Press any key to continue.

The screenshot shows a C IDE interface with a code editor and a terminal window. The code editor contains the following C code:

```
1 #include<stdio.h>
2
3 enum birds {SPARROW, PEACOCK, PARROT};
4 enum animals {TIGER = 8, LION, RABBIT, ZEBRA};
5
6 int main()
7 {
8     enum birds m = TIGER;
9     int k;
10    k = m;
11    printf("%d\n", k);
12
13    return 0;
14 }
15
16
```

The terminal window shows the output of the program:

```
8
Process returned 0 (0x0) execution time : 1.163 s
Press any key to continue.
```

The screenshot shows a C IDE interface with a code editor and a terminal window. The code editor contains the following C code:

```
1 #include<stdio.h>
2
3 #define MAX 2
4
5 enum bird {SPARROW = MAX + 1, PARROT = SPARROW + MAX};
6
7 int main()
8 {
9
10     enum bird b = PARROT;
11     printf("%d\n", b);
12
13
14     return 0;
15 }
```

The terminal window shows the output of the program:

```
5
Process returned 0 (0x0) execution time : 1.691 s
Press any key to continue.
```

The screenshot shows a C IDE interface with a code editor and a terminal window. The code editor contains the following C code:

```
1 #include<stdio.h>
2
3
4 int main()
5 {
6
7     int i = 3;
8     int j = i / -2;
9     int k = i % -2;
10    printf("%d \t %d \t %d", i, j, k);
11
12
13    return 0;
14 }
```

The terminal window shows the output of the program:

```
3      -1      1
Process returned 0 (0x0) execution time : 0.543 s
Press any key to continue.
```

The screenshot shows a C programming environment. The code editor window contains the following C code:

```
1 #include<stdio.h>
2
3
4 int main()
5 {
6
7     int y = 3;
8     int x = 5 % 2 * 3 / 2;
9     printf("Value of x is %d",x);
10
11    return 0;
12 }
```

The terminal window shows the output of the program execution:

```
Value of x is 1
Process returned 0 (0x0)  execution time : 1.237 s
Press any key to continue.
```

The screenshot shows a C programming environment. The code editor window contains the following C code:

```
1 #include<stdio.h>
2
3
4 int main()
5 {
6
7     int a = 3;
8     int b = ++a + a++ + --a;
9     printf("Value of b is %d",b);
10
11    return 0;
12 }
```

The terminal window shows the output of the program execution:

```
Value of b is 11
Process returned 0 (0x0)  execution time : 0.583 s
Press any key to continue.
```

The screenshot shows a C programming environment. The code editor window contains the following C code:

```
1 #include<stdio.h>
2
3
4 int main()
5 {
6
7     int a = 10, b = 5, c = 5;
8     int d;
9     d = a == (b + c);
10    printf("%d", d);
11
12    return 0;
13 }
```

The terminal window shows the output of the program execution:

```
1
Process returned 0 (0x0)  execution time : 1.340 s
Press any key to continue.
```

The screenshot shows a C IDE interface with two windows. The left window is titled "Start here" and contains the following C code:

```
1 #include<stdio.h>
2
3
4 int main()
5 {
6     int x = 1, y = 0, z = 5;
7     int a = x && y || z++;
8     printf("%d\t%d", a, z);
9
10
11
12 return 0;
13 }
14
```

The right window is titled "C:\Users\Mustakim\Desktop\New Text Document.exe" and displays the output of the program:

```
1       6
Process returned 0 (0x0)  execution time : 0.255 s
Press any key to continue.
```

The screenshot shows a C IDE interface with two windows. The left window is titled "Start here" and contains the following C code:

```
1 #include<stdio.h>
2
3
4 int main()
5 {
6     int i = 20;
7     int *p = &i;
8     printf("%d\n", *p++);
9
10
11
12 return 0;
13 }
14
```

The right window is titled "Select "C:\Users\Mustakim\Desktop\New Text Docume..." and displays the output of the program:

```
20
Process returned 0 (0x0)  execution time : 1.283 s
Press any key to continue.
```

The screenshot shows a C IDE interface with two windows. The left window is titled "Start here" and contains the following C code:

```
1 #include<stdio.h>
2
3
4 int main()
5 {
6     int x = 10;
7     int *p = &x;
8     int *k = p++;
9     int r = p - k;
10
11     printf("%d", r);
12
13
14 return 0;
15 }
16
```

The right window is titled "C:\Users\Mustakim\Desktop\New Text Document.exe" and displays the output of the program:

```
1
Process returned 0 (0x0)  execution time : 0.571 s
Press any key to continue.
```

```
#include<stdio.h>
int main()
{
    int i = 0;
    int j = 0;
    for (i = 0;i < 3; i++) {
        for (j = 0;j < 2; j++) {
            if (i > 1)
                continue;
            printf("FOAT \n");
        }
    }
    return 0;
}
```

FOAT  
FOAT  
FOAT  
FOAT

Process returned 0 (0x0) execution time : 1.335 s  
Press any key to continue.

```
#include<stdio.h>
int main()
{
    int i = 0;
    int j = 0;
    for (i = 0;i < 3; i++) {
        for (j = 0;j < 2; j++) {
            if (i < 2)
                break;
            printf("FOAT \n");
        }
    }
    return 0;
}
```

FOAT  
FOAT

Process returned 0 (0x0) execution time : 0.553 s  
Press any key to continue.

## Computer Network MCQ

1. The communication mode that supports data in both directions at the same time is.....
  - a) simplex
  - b) half-duplex
  - c) full-duplex
  - d) multiplex
2. Why was the OSI model developed?
  - a) manufacturers disliked the TCP/IP protocol suite
  - b) the rate of data transfer was increasing exponentially
  - c) standards were needed to allow any two systems to communicate
  - d) none of the above
3. The number of layers in ISO OSI reference model is \_\_\_\_\_
  - a) 5
  - b) 7
  - c) 6
  - d) 10
4. CRC stands for \_\_\_\_\_
  - a) Cyclic redundancy check
  - b) Code repeat check
  - c) Code redundancy check
  - d) Cyclic repeat check
5. Who invented the modem?
  - a) Wang Laboratories Ltd.
  - b) AT & T Information Systems, USA
  - c) Apple Computers Inc.
  - d) Digital Equipment Corp
6. Pure ALOHA has a maximum throughput of -----
  - a) A.16.4 %
  - b) B. 18.4 %
  - c) C. 7.4 %
  - d) D. 1 %
7. Which Project 802 standard provides for a collision-free protocol?
  - a) 802.2
  - b) 802.3
  - c) 802.5
  - d) 802.6
8. The 802.5 standard implements a way for preventing collisions on the network. How are collisions prevented when using this standard?
  - a) CSMA/CD
  - b) Token passing
  - c) Collision detection
  - d) Time sharing
9. Transport layer of OSI model lies between Network and \_\_\_\_\_ layer
  - a) Application
  - b) Data link
  - c) Session
  - d) Presentation
10. Bridge works in which layer of the OSI model?
  - a) Application layer
  - b) Transport layer
  - c) Network layer
  - d) Data link layer
11. Why IP Protocol is considered as unreliable?
  - a) A packet may be lost
  - b) Packets may arrive out of order
  - c) Duplicate packets may be generated
  - d) All of the above
12. The Internet is an example of.....
  - a) Cell switched network
  - b) circuit switched network
  - c) Packet switched network
  - d) All of above
13. What is the use of Ping command?
  - a) To test a device on the network is reachable
  - b) To test a hard disk fault
  - c) To test a bug in an Application
  - d) To test a Printer Quality
14. The combination of an IP address and a port number is known as \_\_\_\_\_
  - a) network number
  - b) socket address
  - c) subnet mask number
  - d) MAC address
15. Which of the following is reliable communication?
  - a) TCP
  - b) IP
  - c) UDP
  - d) All of them
16. What is the size of Host bits in Class B of IP address?
  - a) 04
  - b) 08
  - c) 16
  - d) 32

- 17. Which of the following TCP/IP protocol is used for transferring electronic mail messages from one machine to another?**
- a) FTP
  - b) SNMP
  - c) **SMTP**
  - d) RPC
- 18. Which of the following device is used to connect two systems, especially if the systems use different protocols?**
- a) hub
  - b) bridge
  - c) **gateway**
  - d) repeater
- 19. \_\_\_\_\_ can detect burst error of length less than or equal to degree of the polynomial and detects burst errors that affect odd number of bits.**
- a) Hamming Code
  - b) **CRC**
  - c) VRC
  - d) None of the above
- 20. The PSTN is an example of a ..... network.**
- a) packet switched
  - b) **circuit switched**
  - c) message switched
  - d) None of these
- 21. A subset of a network that includes all the routers but contains no loops is called**
- a) **spanning tree**
  - b) spider structure
  - c) spider tree
  - d) none of the mentioned
- 22. ICMP is primarily used for.....**
- a) **error and diagnostic functions**
  - b) addressing
  - c) forwarding
  - d) none of the mentioned
- 23. FDDI is a**
- a) **ring network**
  - b) star network
  - c) mesh network
  - d) bus based network
- 24. When displaying a web page, the application layer uses the.....**
- a) **HTTP protocol**
  - b) FTP protocol
  - c) SMTP protocol
  - d) none of the mentioned
- 25. Which of the following is a form of DoS attack?**
- a) Vulnerability attack
  - b) Bandwidth flooding
  - c) Connection flooding
  - d) **All of the mentioned**
- 26. Which transmission media has the highest transmission speed in a network?**
- a) coaxial cable
  - b) twisted pair cable
  - c) **optical fiber**
  - d) electrical cable
- 27. The slowest transmission speeds are.....**
- a) Coaxial cable
  - b) **Twisted pair wire**
  - c) Fiber-optic cable
  - d) Microwave
- 28. What does the acronym ISDN stand for?**
- a) Indian Standard Digital Network
  - b) **Integrated Services Digital Network**
  - c) Intelligent Services Digital Network
  - d) Integrated Services Data Network
- 29. A small network making up the Internet and also having a small numbers of computers within it is called.....**
- a) Host
  - b) Address
  - c) **Subdomain**
  - d) None of the above
- 30. The \_\_\_\_\_ translates internet domain and host names to IP address.**
- a) **domain name system**
  - b) routing information protocol
  - c) network time protocol
  - d) internet relay chat
- 31. Which address is the loopback address?**
- a) 0.0.0.1
  - b) 127.0.0.0
  - c) **127.0.0.1**
  - d) 255.255.255.255
- 32. What is the port number for HTTP?**
- a) 99
  - b) 86
  - c) **80**
  - d) 23
- 33. With an IP address of 201.142.23.12, what is your default subnet mask?**
- a) 0.0.0.0
  - b) 255.0.0.0
  - c) 255.255.0.0
  - d) **255.255.255.0**

- 34. Which Layer is Responsible for Congestion Control?**
- a) Network Layer
  - b) Data link Layer
  - c) **Transport Layer**
  - d) Application layer
- 35. Which of these is a feature of hubs?**
- a) Hubs amplifies the incoming signal.
  - b) Hubs understand frames, packets or headers
  - c) **All lines coming into a Hub must operate at a same speed.**
  - d) all of these
- 36. Which of the following is a MAC address?**
- a) 192.166.200.50
  - b) 00056A:01A01A5CCA7FF60
  - c) 568, Airport Road
  - d) **01:A5: BB: A7: FF: 60**
- 37. The main difference between TCP and UDP is**
- a) UDP is connection oriented whereas TCP is datagram service
  - b) TCP is an Internet protocol whereas UDP is an ATM protocol
  - c) **UDP is a datagram whereas TCP is a connection-oriented service**
  - d) All of the above
- 38. What operates in the Data Link and the Network layer?**
- a) NIC
  - b) Bridge
  - c) **Brouter**
  - d) Router
- 39. In OSI model, which of the following layer provides error-free delivery of data?**
- a) Data link
  - b) Network
  - c) **transport**
  - d) Session
- 40. What is the first octet range for a class A IP address?**
- a) **1 - 126**
  - b) 192 - 255
  - c) 192 - 223
  - d) 1 - 127
- 41. What is the first octet range for a class B IP address?**
- a) 128 - 255
  - b) 1 - 127
  - c) 192 - 223
  - d) **128 - 191**
- 42. Which OSI layer handles logical address to logical name resolution?**
- a) **Transport**
  - b) Physical
  - c) Presentation
  - d) Data Link
- 43. A \_\_\_\_\_ is a device that forwards packets between networks by processing the routing information included in the packet.**
- a) Bridge
  - b) Firewall
  - c) **Router**
  - d) Hub
- 44. Network congestion occurs \_\_\_\_\_**
- a) **In case of traffic overloading**
  - b) When a system terminates
  - c) When connection between two nodes terminates
  - d) In case of transfer failure
- 45. Which of the following networks extends a private network across public networks?**
- a) Local area network
  - b) **Virtual private network**
  - c) Enterprise private network
  - d) Storage area network
- 46. Which of the following layers is an addition to OSI model when compared with TCP IP model?**
- a) Application layer
  - b) Presentation layer
  - c) Session layer
  - d) **Session and Presentation layer**
- 47. The functionalities of the presentation layer include \_\_\_\_\_**
- a) Data compression
  - b) Data encryption
  - c) Data description
  - d) **All of the mentioned**
- 48. Delimiting and synchronization of data exchange is provided by \_\_\_\_\_**
- a) Application layer
  - b) **Session layer**
  - c) Transport layer
  - d) Link layer
- 49. Which layer is used to link the network support layers and user support layers?**
- a) Session layer
  - b) Data link layer
  - c) **Transport layer**
  - d) Network layer

50. Transmission data rate is decided by \_\_\_\_\_
- a) Network layer
  - b) Physical layer
  - c) Data link layer
  - d) Transport layer
51. Which of the following are transport layer protocols used in networking?
- a) TCP and FTP
  - b) UDP and HTTP
  - c) TCP and UDP
  - d) HTTP and FTP
52. The state when dedicated signals are idle are called \_\_\_\_\_
- a) Death period
  - b) Poison period
  - c) Silent period
  - d) Stop period
53. In TDM, slots are further divided into \_\_\_\_\_
- a) Seconds
  - b) Frames
  - c) Packets
  - d) Bits
54. In TDM, the transmission rate of a multiplexed path is always \_\_\_\_\_ the sum of the transmission
- a) Greater than
  - b) Lesser than
  - c) Equal to
  - d) Equal to or greater than
55. Propagation delay depends on \_\_\_\_\_
- a) Packet length
  - b) Transmission rate
  - c) Distance between the routers
  - d) Speed of the CPU
56. Which of the following protocols below work in the application layer?
- a) POP
  - b) SMTP
  - c) FTP
  - d) All of the above
57. A network point that provides entrance into another network is called as \_\_\_\_\_
- a) Node
  - b) Gateway
  - c) Switch
  - d) Router
58. Token Ring is a data link technology for?
- a) WAN
  - b) MAN
  - c) LAN
  - d) both a and b above
59. TELNET used \_\_\_\_\_ protocol for data connection
- a) TCP
  - b) UDP
  - c) IP
  - d) DHCP
60. \_\_\_\_\_ assigns a unique number to each IP network adapter called the MAC address.
- a) Media Access Control
  - b) Metro Access Control
  - c) Metropolitan Access Control
  - d) Both B and C above
61. A packet whose destination is outside the local TCP/IP network segment is sent to the \_\_\_\_\_
- a) File server
  - b) Default gateway
  - c) DNS server
  - d) DHCP server
62. Which protocol below operates at the network layer in the OSI model?
- a) IP
  - b) ICMP
  - c) RARP
  - d) All of the above
63. Which of the IP headers decides when the packet should be discarded?
- a) Fragment control
  - b) TTL
  - c) Checksum
  - d) Header length
64. Which port is reserved for use of the SMTP protocol?
- a) 21
  - b) 23
  - c) 25
  - d) 53
65. What is the max data capacity of STP?
- a) 10 mbps
  - b) 100 mbps
  - c) 1000 mbps
  - d) 10000 mbps
66. In which topology there is a central controller or hub?
- a) Star
  - b) Mesh
  - c) Ring
  - d) Bus

67. Bits can be sent over guided and unguided media as analog signal by

- a) digital modulation
- b) amplitude modulation
- c) frequency modulation
- d) phase modulation

68. How long is an IPv6 address?

- a) 32 bits
- b) 128 bytes
- c) 64 bits
- d) 128 bits

69. Communication between a computer and a keyboard involves..... transmission

- a) Automatic
- b) Half-duplex
- c) Full-duplex
- d) Simplex

70. MAC address is of

- a) 24 bits
- b) 36 bits
- c) 42 bits
- d) 48 bits

71. Ethernet frame consists of

- a) MAC address
- b) IP address
- c) both MAC address and IP address
- d) none of the mentioned

72. What flavor of Network Address Translation can be used to have one IP address allow many users to connect to the global Internet?

- a) NAT
- b) Static
- c) Dynamic
- d) PAT

73. Which multiple access technique is used by IEEE 802.11 standard for wireless LAN?

- a) CDMA
- b) CSMA/CA
- c) ALOHA
- d) None of the mentioned

74. Multiplexing is used in \_\_\_\_\_

- a) Packet switching
- b) Circuit switching
- c) Data switching
- d) Packet & Circuit switching

75. A list of protocols used by a system, one protocol per layer, is called

- a) Protocol architecture
- b) protocol stack
- c) protocol suite
- d) none of the mentioned

76. Which multiplexing technique transmits digital signals?

- a) FDM
- b) TDM
- c) WDM
- d) FDM & WDM

77. A local telephone network is an example of a.....network.

- a) Packet switched
- b) Circuit switched
- c) Both Packet switched and Circuit switched
- d) Line switched

78. Most packet switches use ..... principle

- a) Stop and wait
- b) Store and forward
- c) Both Stop and wait and Store and forward
- d) Stop and forward

79. The default connection type used by HTTP is

- a) Persistent
- b) Non-persistent
- c) Can be either persistent or non-persistent depending on connection request
- d) None of the mentioned

80. FTP is built on \_\_\_\_\_ architecture

- a) Client-server
- b) P2P
- c) Both of the mentioned
- d) None of the mentioned

81. FTP uses \_\_\_\_\_ parallel TCP connections to transfer a file

- a) 1
- b) 2
- c) 3
- d) 4

82. If you have to send multimedia data over SMTP it has to be encoded into

- a) Binary
- b) Signal
- c) ASCII
- d) None of the mentioned

83. Secure shell (SSH) network protocol is used for.....

- a) secure data communication
- b) remote command-line login
- c) remote command execution
- d) all of the mentioned

84. SSH uses \_\_\_\_\_ to authenticate the remote computer.

- a) public-key cryptography
- b) private-key cryptography
- c) any of public-key or private-key
- d) both public-key & private-key

85. You have 10 users plugged into a hub running 10Mbps half-duplex. There is a server connected to the switch running 10Mbps half-duplex as well. How much bandwidth does each host have to the server?

- a) 100 kbps
- b) 1 Mbps
- c) 2 Mbps
- d) 10 Mbps

86. DHCP (dynamic host configuration protocol) provides .....to the client.

- a) IP address
- b) MAC address
- c) URL
- d) None of the mentioned

87. The DHCP server \_\_\_\_\_

- a) maintains a database of available IP addresses
- b) maintains the information about client configuration parameters
- c) grants a IP address when receives a request from a client
- d) all of the mentioned

88. Which protocol does DHCP use at the Transport layer?

- a) IP
- b) TCP
- c) UDP
- d) ARP

89. Where is a hub specified in the OSI model?

- a) Session layer
- b) Physical layer
- c) Data Link layer
- d) Application layer

90. IPsec is designed to provide the security at the

- a) Transport layer
- b) Network layer
- c) Application layer
- d) Session layer

91. Pretty good privacy (PGP) is used in

- a) Browser security
- b) Email security
- c) FTP security
- d) None of the mentioned

92. ATM and frame relay are

- a) virtual circuit networks
- b) datagram networks
- c) virtual private networks
- d) none of the mentioned

93. ATM uses the

- a) asynchronous frequency division multiplexing
- b) asynchronous time division multiplexing
- c) asynchronous space division multiplexing
- d) none of the mentioned

94. An ATM cell has the payload field of

- a) 32 bytes
- b) 48 bytes
- c) 64 bytes
- d) 128 bytes

95. Frame relay has error detection at the

- a) physical layer
- b) data link layer
- c) network layer
- d) transport layer

96. In classless addressing, there are no classes but addresses are still granted in

- a) IPs
- b) Blocks
- c) Codes
- d) Sizes

97. The header length of an IPv6 datagram is.....

- a) 10bytes
- b) 25bytes
- c) 30bytes
- d) 40bytes

98. The main reason for transition from IPv4 to IPv6 is

- a) Huge number of systems on the internet
- b) Very low number of system on the internet
- c) Providing standard address
- d) None of the mentioned

99. Which of the following is the broadcast address for a Class B network ID using the default subnet mask?

- a) 172.16.10.255
- b) 255.255.255.255
- c) 172.16.255.255
- d) 172.255.255.255

100. If you wanted to have 12 subnets with a Class C network ID, which subnet mask would you use?

- a) 255.255.255.252
- b) 255.255.255.255
- c) 255.255.255.240
- d) 255.255.255.248

101. Which protocol is used for Storage management?

- a) SNMP
- b) LDAP
- c) POP3
- d) MIB

102. \_\_\_\_\_ allows you to connect and login to a remote computer

- a) Telnet
- b) FTP
- c) HTTP
- d) None of the mentioned

103. What PPP protocol provides dynamic addressing, authentication, and multilink?

- a) NCP
- b) HDLC
- c) LCP (Link Control Protocol)
- d) X.25

104. What is a stub network?

- a) A network with more than one exit point.
- b) A network with more than one exit and entry point.
- c) A network with only one entry and no exit point.
- d) A network that has only one entry and exit point.

105. In TCP, sending and receiving data is done as

- a) Stream of bytes
- b) Sequence of characters
- c) Lines of data
- d) Packets

106. TCP groups a number of bytes together into a packet called

- a) Packet
- b) Buffer
- c) Segment
- d) Stack

107. Which of the following is false with respect to UDP?

- a) Connection-oriented
- b) Unreliable
- c) Transport layer protocol
- d) All of the mentioned

108. what is the header size of UDP packet?

- a) 8 bytes
- b) 8 bits
- c) 16 bytes
- d) 124 bytes

**109. The technique in which a congested node stops receiving data from the immediate upstream node or nodes is called as**

- a) Admission policy
- b) Backpressure
- c) Forward signaling
- d) Backward signaling

**110. What is the main reason the OSI model was created?**

- a) To create a layered model larger than the DoD model.
- b) So application developers can change only one layer's protocols at a time.
- c) So different networks could communicate.
- d) So Cisco could use the model.

**111. The functions of a DNS server to convert ..... name to ..... address?**

- a) Web address and DNS
- b) Email address and DNS
- c) MAC address and IP
- d) DNS and IP

**112. Active HUB is under ----layer but passive HUB is under ----layer OSI model?**

- a) Data link and network
- b) Physical and data link
- c) physical and zero
- d) network and transport

**113. Which of the following cables is widely used in LAN?**

- a) Twisted pair
- b) Co-axial
- c) Fiber optic
- d) None

**114. Physical transmission medium lies in which layer of OSI reference model?**

- a) Physical
- b) Network
- c) session
- d) None

**115. The datalink layer takes the packet from-----**

**----- and encapsulates them into frame transmission.**

- a) Network layer
- b) Physical layer
- c) Transport layer
- d) Application layer

**116. This is an IP address 168.212.226.204 which class this address belongs to?**

- a) Class A
- b) Class B
- c) Class C
- d) Class D

**117. A DNS client is called.....**

- a) DNS updaters
- b) DNS resolver
- c) DNS handler
- d) none of the mentioned

**118. If a server has no clue about where to find the address for a hostname, then**

- a) server asks to the root server
- b) server asks to its adjacent server
- c) request is not processed
- d) none of the mentioned

**119. A switch is most often used to connect.....**

- a) Individual Computer
- b) Different LANs
- c) Cable segments of a LAN
- d) None of the above

**120. Which one of the following allows client to update their DNS entry as their IP address changes?**

- a) dynamic DNS
- b) mail transfer agent
- c) authoritative name server
- d) none of the mentioned

**121. In wireless ad-hoc network**

- a) access point is not required
- b) access point is must
- c) nodes are not required
- d) none of the mentioned

**122. Which multiple access technique is used by IEEE 802.11 standard for wireless LAN?**

- a) CDMA
- b) CSMA/CA
- c) ALOHA
- d) none of the mentioned

**123. A wireless network interface controller can work in**

- a) infrastructure mode
- b) ad-hoc mode
- c) both (a) and (b)
- d) none of the mentioned

**124. Mostly \_\_\_\_\_ is used in wireless LAN.**

- a) time division multiplexing
- b) orthogonal frequency division multiplexing
- c) space division multiplexing
- d) none of the mentioned

**125. Which one of the following events is not possible in wireless LAN?**

- a) collision detection
- b) Acknowledgement of data frames
- c) multi-mode data transmission
- d) none of the mentioned

**126. WiMAX provides.....**

- a) simplex communication
- b) half duplex communication
- c) full duplex communication
- d) none of the mentioned

**127. In TCP/IP network, the port address is**

- a) 16-bit
- b) 32-bit
- c) 64-bit
- d) 128-bit

**128. WiMAX is mostly used for.....**

- a) local area network
- b) metropolitan area network
- c) personal area network
- d) none of the mentioned

**129. An interconnected collection of piconet is called**

- a) scatternet
- b) micronet
- c) mininet
- d) none of the mentioned

**130. Bluetooth is the wireless technology for.....**

- a) local area network
- b) personal area network
- c) both (a) and (b)
- d) none of the mentioned

**131. Bluetooth uses.....**

- a) frequency hopping spread spectrum
- b) orthogonal frequency division multiplexing
- c) time division multiplexing
- d) none of the mentioned

**132. In the piconet of bluetooth one master device**

- a) can not be slave
- b) can be slave in another piconet
- c) can be slave in the same piconet
- d) none of the mentioned

**133. A scatternet can have maximum**

- a) 10 piconets
- b) 20 piconets
- c) 30 piconets
- d) 40 piconets

**134. Internet access by transmitting digital data over the wires of a local telephone network is provided by**

- a) leased line
- b) digital subscriber line
- c) digital signal line
- d) none of the mentioned

**135. Which protocol assigns IP address to the client connected in the internet?**

- a) **DHCP**
- b) IP
- c) RPC
- d) none of the mentioned

**136. In cryptography, what is cipher?**

- a) **algorithm for performing encryption and decryption**
- b) encrypted message
- c) both (a) and (b)
- d) none of the mentioned

**137. In asymmetric key cryptography, the private key is kept by**

- a) sender
- b) **receiver**
- c) sender and receiver
- d) all the connected devices to the network

**138. What is data encryption standard (DES)?**

- a) **block cipher**
- b) stream cipher
- c) bit cipher
- d) none of the mentioned

**139. Firewalls are often configured to block**

- a) **UDP traffic**
- b) TCP traffic
- c) Both of the mentioned
- d) None of the mentioned

**140. After obtaining the IP address, to prevent the IP conflict the client may use**

- a) internet relay chat
- b) broader gateway protocol
- c) **address resolution protocol**
- d) none of the mentioned

**141. Secure shell (SSH) network protocol is used for**

- a) secure data communication
- b) remote command-line login
- c) remote command execution
- d) **all of the mentioned**

**142. SSH uses \_\_\_\_\_ to authenticate the remote computer.**

- a) **public-key cryptography**
- b) private-key cryptography
- c) both (a) and (b)
- d) none of the mentioned

**143. A session may include**

- a) **Zero or more SMTP transactions**
- b) Exactly one SMTP transactions
- c) Always more than one SMTP transactions
- d) Number of SMTP transactions cant be determined

**144. Fragmentation has following demerits**

- a) complicates routers
- b) open to DOS attack
- c) overlapping of fragments.
- d) **All of the mentioned**

**145. IPv6 does not use \_\_\_\_\_ type of address**

- a) **Broadcast**
- b) Multicast
- c) Anycast
- d) None of the mentioned

**146. Which error detection method uses one's complement arithmetic?**

- a) Simply parity check
- b) **Checksum**
- c) Two-dimensional parity check
- d) CRC

**147. An applet \_\_\_\_\_**

- a) is an interpreted program that runs on the client
- b) tracks the number of visitors to a Website
- c) **is a compiled program that usually runs on the client**
- d) collects data from visitors to a Website

**148. IPV6 increases the size of the IP address from**

- a) 64 to 132 bits
- b) **32 to 128 bits**
- c) 64 to 128 bits
- d) None

149. VLANs can \_\_\_\_\_.

- a) reduce network traffics
- b) provide an extra measure of security
- c) None of the above
- d) both (a) and (b)

150. In which type of circuit switching, delivery of data is delayed because data must be stored and retrieved from RAM

- a) Space-division
- b) Time-division
- c) Virtual
- d) Packet

151. What is the maximum data rate of a channel with a bandwidth of 200 KHz if we use four levels of digital signaling?

- a) 400 Kbps
- b) 800 Kbps
- c) 1000 Kbps
- d) 1200 Kbps

152. Which error detection method involves the use of parity bits?

- a) Simple parity check
- b) Two-dimensional parity check
- c) CRC
- d) (a) and (b)

153. A DNS response is classified as ----- if the information comes from a cache memory

- a) Authoritative
- b) Recursive
- c) Unauthoritative
- d) Iterative

154. -----is a client-server program that provides an IP address, subnet mask, IP address of a router, and IP address of a name server to a computer

- a) NAT
- b) DHCP
- c) CIDR
- d) ISP

155. What is the maximum data rate in IEEE 802.11n?

- a) 300 Mbps
- b) 600 Mbps
- c) 1 Gbps
- d) 832 Mbps

156. Major function of a transport layer in the OSI model is to perform

- a) Peer to peer message encryption
- b) Node to node message delivery
- c) Transparent transfer of data between end users
- d) None of the above

157. An IPv6 basic header is fixed as

- a) 32 bytes long
- b) 40 bytes long
- c) 64 bits long
- d) 128 bit long

158. Which of the following services uses both TCP and UDP ports?

- a) DNS
- b) TFTP
- c) SSH
- d) TELNET

159. A single switch port is considered as

- a) A separate unicast domain
- b) A separate broadcast domain
- c) A separate multicast domain
- d) A separate collision domain

160. An Access point operates in which layer of OSI model?

- a) Data link Layer
- b) Presentation layer
- c) Physical layer
- d) Transport layer

161. Which protocol provides e-mail facility among different hosts?

- a) FTP
- b) SMTP
- c) TELNET
- d) SNMP

162. One of the major drawbacks of symmetric system is \_\_\_\_\_

- a) Key Distribution
- b) Key Diffusion
- c) Key Confusion
- d) Key Construction

163. Repeat cycles are used in \_\_\_\_\_

- a) AES and RSA
- b) AES and DES
- c) DES and RSA
- d) RSA and VAN

164. Public key system is best used for \_\_\_\_\_

- a) Key exchange
- b) Authentication
- c) Key exchange and Authentication
- d) Validation

165. \_\_\_\_\_ is a classic example of symmetric key exchange procedure.

- a) Certificate
- b) Cryptographic hash function
- c) Diffie-Hellman Scheme
- d) Digital Signature

166. SSL utilizes \_\_\_\_\_ Algorithm in order to provide a message integrity.

- a) Hash
- b) NULL
- c) Encryption
- d) Decryption

167. A wireless network uses ..... waves to transmit signals.

- a) Mechanical
- b) Radio
- c) Sound
- d) Magnetic

168. Firewalls are used to protect against .....

- a) Unauthorized Access
- b) Virus Attacks
- c) Data Driven Attacks
- d) Fire Attacks

169. Datagram is related with ..... service and virtual circuit is related to.....service.

- a) both are connectionless
- b) Connectionless and connection oriented.
- c) connection oriented and connectionless
- d) None

170. An Ethernet LAN using the OSPF protocol with five attached routers can be called a ----- network.

- a) Point-to-point
- b) Stub
- c) Transient
- d) Virtual

171. Address Resolution Protocol (ARP) is used to find the ..... of a local device.

- a) hardware address
- b) IP address
- c) Routing information
- d) None

172. BUS, Ring and Star Topologies are mostly used in

- a) LAN
- b) MAN
- c) WAN
- d) None

173. Connection of telephone regional office is a practical example of

- a) MESH topology.
- b) Star topology
- c) BUS topology
- d) None

174. Cable TV and DSL are example of

- a) MAN
- b) LAN
- c) WAN
- d) None

175. Repeaters are used in

- a) Ring topology.
- b) MESH topology.
- c) Star topology
- d) BUS topology

176. Modulator and Demodulator combinedly known as

- a) Modem
- b) Demo
- c) Madam
- d) Mode

177. The function of LLC sub-layer of data link layer is:

- a) Framing and channel allocation
- b) Channel allocation and error control
- c) Error control and security
- d) Framing and error control

178. BUS backbone uses

- a) LAN and Bridges.
- b) Wan and Switches
- c) MAN and Bridges
- d) None

**179. Star backbone uses**

- a) Switch
- b) HUB
- c) Bridge
- d) None

**180. The security services that IPSec provide requires**

shared keys to perform\_\_\_\_\_

- a) Privacy
- b) Reliability
- c) Authentication
- d) Security

**181. IEEE 802.3 is slang name for**

- a) ETHERNET
- b) ARPANET
- c) TELNET
- d) None

**182. Repeater works with.....**

- a) volts or signals.
- b) Binary number
- c) Digits
- d) None

**183. Frames from one LAN can be transmitted to another LAN via the device –**

- a) Router
- b) Repeater
- c) Modem
- d) Bridge

**184. Which layer id user supported?**

- a) Session layer
- b) Presentation layer
- c) Application layer
- d) None

**185. ....is an authentication service for passwords.**

- a) Kerberos
- b) ICMP
- c) TCP
- d) MIME

**186. IEEE 802.11 is a slang name for**

- a) Wi-Fi
- b) Bluetooth
- c) Ethernet
- d) None

**187. FDDI stands for.**

- a) Fiber Distributed Data Interface
- b) Fiber Data Distributed Interface
- c) Fiber Dual Distributed Interface
- d) Fiber Distributed Data Interface

**188. Which of the following is a possible IP address in a**

**network with IP address 172.16.10.5 and subnet mask 255.255.248.0?**

- a) 172.16.8.0
- b) 192.168.8.0
- c) 224.168.1.0
- d) None

**189. Which device support circuit switching?**

- a) HUB
- b) Switch
- c) Router
- d) None

**190. Which layer is used for wireless connection in IoT devices?**

- a) Data link layer
- b) Network layer
- c) Physical layer
- d) None

**191. Select from the following which one in the routing algorithm can be used for network layer design.**

- a) shortest path algorithm
- b) link-state routing
- c) distance vector routing
- d) all of the mentioned

**192. Choose the function of a router**

- a) changing the data from one format to another
- b) error detection in data
- c) send the packet to the uplinks
- d) None of the above

**193. Select the uses of the switch in a datagram network.**

- a) destination address
- b) routing table
- c) sender address
- d) header

**194. The Routing processor searches in the routing table is known as**

- a) switch fabric
- b) table lookup
- c) buffer
- d) rolling table

**195. Protocol used for storage management is?**

- a) POP3
- b) SNMP
- c) LDAP
- d) None of these

**196. Which private network uses storage protocol rather than networking protocol?**

- a) Wide area network
- b) Storage area network
- c) Local area network
- d) None of these

197. Which of the following topology is the multipoint topology?

- a) Bus
- b) Star
- c) Mesh
- d) Ring

198. \_\_\_\_\_ are the types of firewalls.

- a) Packet Filtering
- b) Dual Homed Gateway
- c) Both A and B
- d) None of these

199. one of the following is a path vector routing?

- a) exterior gateway protocol
- b) inter-domain routing
- c) network routing protocol
- d) All of these

200. IDEA algorithm generates \_\_\_\_\_ keys.

- a) 56
- b) 28
- c) 52
- d) 72

201. In fiber optics, the signal source is \_\_\_\_\_ waves.

- a) light
- b) radio
- c) infrared
- d) very low frequency

202. The \_\_\_\_\_ layer is responsible for node to node packet delivery.

- a) session
- b) network
- c) physical
- d) data link

203. The speed mismatch between the sender and the receiver is called \_\_\_\_\_

- a) error control
- b) b speed error
- c) c flow control
- d) d transmission control

204. FTP runs exclusively over \_\_\_\_\_

- a) HTTP
- b) TCP
- c) SMTP
- d) HTML

205. Which of the following primarily uses guided media?

- a) cellular telephone system
- b) local telephone system
- c) satellite communications
- d) radio broadcasting

206. PSTN represents \_\_\_\_\_.

- a) private switched transmission network
- b) public switched telephone network
- c) private switched telephone network
- d) public switched transmission network

207. \_\_\_\_\_ overcame the registered number issue by assigning each organization one network number from the IPv4 address space.

- a) Tracking
- b) Subnetting
- c) Packeting
- d) Switching

208. ISDN is an acronym for \_\_\_\_\_.

- a) Information Services for Digital Networks
- b) Internetwork System for Data Networks
- c) Integrated Services Digital Networks
- d) Integrated Signals Digital Network

209. Data rate depends on three factors

- a) Bandwidth available
- b) Level of the signals we use
- c) Quality of the channel
- d) All of the above

210. The radio communication spectrum is divided into bands based on \_\_\_\_\_.

- a) amplitude
- b) frequency
- c) cost and hardware
- d) transmission medium

211. The term “e-mail” applies both to the Internet e-mail system based on the \_\_\_\_\_ and to \_\_\_\_\_ allowing users within one organization to e-mail each other.

- a) FTP, Intranet Systems
- b) SMTP, Intranet Systems
- c) FTP, Internet Systems
- d) SMTP, Internet Systems

212. \_\_\_\_\_ CSMA is less greedy whereas \_\_\_\_\_ CSMA is selfish.

- a) Non-persistent, 1-persistent
- b) 1-persistent, p-persistent
- c) p-persistent, 1-persistent
- d) 1-persistent, non-persistent

213. IP Packet is a \_\_\_\_\_ and \_\_\_\_\_ based model.

- a) connectionless, network
- b) connection, network
- c) connectionless, datagram
- d) connection, datagram

214. \_\_\_ are special-interest groups that quickly test, evaluate, and standardize new technologies.

- a) Forums
- b) Regulatory agencies
- c) Standards organizations
- d) All of the above

215. FDDI stands for

- a) Fixed distributed data interface
- b) First division data interface
- c) Fiber distributed data interface
- d) None

216. The \_\_\_ layer is responsible for resolving access to the shared media or resources.

- a) physical
- b) MAC sub layer
- c) Network
- d) Transport

217. Fiber-optic communication system uses.

- a) Simplex transmission
- b) half-duplex
- c) full-duplex
- d) None of the above

218. The concept of connected computers sharing resources is called \_\_\_.

- a) Internetworking
- b) Intranetworking
- c) Networking
- d) None of the above

219. IMP stands for

- a) Internal message passing
- b) Interface message passing
- c) Internal message parsing
- d) Interface message parsing

220. Process to process delivery of the entire message is done by

- a) Physical layer
- b) Transport layer
- c) Session layer
- d) Presentation layer

221. Dialog controller role is played by

- a) Session layer
- b) Application layer
- c) Transport layer
- d) Network layer

222. Syntax and semantics of the information exchanged between two systems is done by

- a) Session layer
- b) Application layer
- c) Transport layer
- d) Presentation layer

223. PDU stands for

- a) Power data unit
- b) Protocol digital unit
- c) Presentation data unit
- d) Protocol data unit

224. Transmission lines suffer from the major problem

- a) Attenuation distortion
- b) Delay distortion
- c) Noise
- d) All of the above

225. In \_\_\_ type of service, no connection is established beforehand or afterward.

- a) acknowledged connectionless service
- b) Unacknowledged connectionless service
- c) acknowledged connection-oriented service
- d) Unacknowledged connection-oriented service

226. Name the protocol used for remote terminal connection service?

- a) RARP
- b) UDP
- c) FTP
- d) TELNET

227. Name the connection when three or more devices share a link together?

- a) Multipoint
- b) Unipoint
- c) Point to point
- d) TELNET

228. One protocol per layer in a list of protocol used by the system is called?

- a) protocol suite
- b) (B) Protocol system
- c) (C) protocol architecture
- d) (D) protocol stack

229. Which methods facilitates a dedicated communication channel between two stations?

- a) Circuit switching
- b) Switch network
- c) Packet switching
- d) None of these

230. When devices are wired together most flexibility is provided by which network?

- a) T-switched networks
- b) Star networks
- c) Ring networks
- d) Bus networks

**231. A diskless machine uses which protocol to obtain its IP address from a server?**

- a) RARP
- b) RIP
- c) RDP
- d) X.25

**232. What is the specialty of OSPF protocol**

- a) discover a network's specific topology
- b) link-state route discovery protocol
- c) better performance than RIP in large internet-works
- d) all of these

**233. Name the functionalities implemented by a transport protocol over and above the network protocol?**

- a) End to end connectivity
- b) Packet delivery in the correct order
- c) Detection of duplicate packets
- d) Recovery from packet losses

**234. Find which of the below can be considered as an example of Bluetooth?**

- a) Wide area network
- b) Virtual private network
- c) Local area network
- d) Personal area network

**235. What is FDDI?**

- a) Bus based network
- b) Mesh network
- c) Star network
- d) Ring network

**236. What is the benefit of the computers connected to a LAN?**

- a) Share information and/or share peripheral equipment
- b) E-mail
- c) Go on line
- d) Run faster

**237. Which of the following are the network services?**

- a) File service
- b) Print service
- c) Database service
- d) All of the above

**238. Which of the following is an application layer service?**

- a) Network virtual terminal
- b) File transfer, access and management
- c) Mail service
- d) All of the above

**239. Which is the main function of transport layer?**

- a) Node to node delivery
- b) End to end delivery
- c) Synchronization
- d) Updating and maintaining routing tables

**240. A network that needs human beings to manually route signals is called....**

- a) Fiber Optic Network
- b) Bus Network
- c) T-switched network
- d) Ring network

**241. Which of the following applications allows a user to access and change remote files without actual transfer?**

- a) DNS
- b) FTP
- c) NFS
- d) Telnet

**242. The data unit in the TCP/IP layer called a .....**

- a) Message
- b) Segment
- c) Datagram
- d) Frame

**243. Which of the following of the TCP/IP protocols is used for transferring files from one machine to another?**

- a) FTP
- b) SMTP
- c) SNMP
- d) RPC

**244. In which OSI layers does the FDDI protocol operate?**

- a) Physical
- b) Data link
- c) Network
- d) A and B

**245. In FDDI, data normally travel on .....**

- a) The primary ring
- b) The Secondary ring
- c) Both rings
- d) Neither ring

**246. The ..... layer of OSI model can use the trailer of the frame for error detection.**

- a) Physical
- b) Data link
- c) Transport
- d) Presentation

**247. In a ..... topology, if there are n devices in a network, each device has n-1 ports for cables.**

- a) Mesh
- b) Star
- c) Bus
- d) Ring

**248. Which of the following is the logical topology?**

- a) Bus
- b) Tree
- c) **Star**
- d) Both A and B

**249. Which of the following is/ are the drawbacks of Ring Topology?**

- a) Failure of one computer, can affect the whole network
- b) Adding or removing the computers disturbs the network activity.
- c) If the central hub fails, the whole network fails to operate.
- d) **Both of A and B**

**250. The performance of data communications network depends on .....**

- a) Number of users
- b) The hardware and software
- c) The transmission
- d) **All of the above**

**251. Find out the OSI layer, which performs token management.**

- a) Network Layer
- b) Transport Layer
- c) **Session Layer**
- d) Presentation Layer

**252. What is the name of the network topology in which there are bi-directional links between each possible node?**

- a) Ring
- b) Star
- c) Tree
- d) **Mesh**

**253. What is the commonly used unit for measuring the speed of data transmission?**

- a) Bytes per second
- b) **Baud**
- c) Bits per second
- d) Both B and C

**254. The loss in signal power as light travels down the fiber is called .....**

- a) **Attenuation**
- b) Propagation
- c) Scattering
- d) Interruption

**255. Which of the following is/are the applications of twisted pair cables**

- a) In the local loop
- b) In the DSL line
- c) In the ISDN Network
- d) **All of the above**

**256. The major problem(s) suffered for transmission**

- lines on physical layer is/are .....**
- a) Attenuation distortion
  - b) Delay distortion
  - c) Noise
  - d) **All of the above**

**257. .... is the lost of energy as the signal propagates outward.**

- a) **Attenuation distortion**
- b) Delay distortion
- c) Noise
- d) None of the above

**258. Which of the following is not the sources of noise?**

- a) Thermal
- b) **Magnetic**
- c) Inter-modulation
- d) Cross talk

**259. Data rate in data communication depends on which of the following factors.**

- a) The bandwidth available
- b) The level of the signals we use
- c) The quality of the channel
- d) **All of the above**

**260. .... is also known as store and forward switching since the messages are stored at intermediate nodes in route to their destinations.**

- a) Message switching
- b) Physical switching
- c) circuit switching
- d) packet switching

**261. .... is used to optimize the use of the channel capacity available in a network, to minimize the transmission latency and to increase robustness of communication.**

- a) Message switching
- b) Linear switching
- c) **circuit switching**
- d) **packet switching**

**262. .... is used in telephone network for bi-directional, real time transfer between computers.**

- a) Message switching
- b) **Circuit switching**
- c) Packet switching
- d) Circular switching

263. The ..... layer provides a well-defined service interface to the network layer, determining how the bits of the physical layer are grouped into frames.

- a) Data Link
- b) Physical
- c) Network
- d) Session

264. The different types of services provided by data link layer is/are ...

- a) Unacknowledged connectionless service
- b) Acknowledged connectionless service
- c) Acknowledged connection-oriented service
- d) All of the above.

265. In ..... there is no need for defining the boundaries of the frames; the size itself can be used a delimiter.

- a) Standard Size Framing
- b) Fixed Size Framing
- c) Variable Size Framing
- d) Constant Size Framing

266. ..... is prevalent in LANs, we need a way to define the end of the frame and the beginning of the next.

- a) Standard Size Framing
- b) Fixed Size Framing
- c) Variable Size Framing
- d) Constant Size Framing

267. Which of the following is/are the methods used for carrying out framing?

- a) Character count
- b) Starting and ending characters, with character stuffing.
- c) Starting and ending flags with bit stuffing.
- d) All of the above

268. The ..... layer links the network support layers and the user support layers.

- a) transport
- b) network
- c) data link
- d) session

269. Which of the following is an application layer service?

- a) remote log-in.
- b) file transfer and access.
- c) mail service
- d) all of the above

270. The ..... layer is responsible for the source-to-destination delivery of a packet across multiple network links.

- a) transport
- b) network
- c) data link
- d) session

271. The ..... layer is responsible for the process-to-process delivery of the entire message.

- a) transport
- b) network
- c) data link
- d) physical

272. The ..... layer establishes, maintains, and synchronizes the interactions between communicating devices.

- a) transport
- b) network
- c) session
- d) physical

273. The ..... layer ensures interoperability between communicating devices through transformation of data into a mutually agreed upon format.

- a) transport
- b) network
- c) data link
- d) presentation

274. The ..... layer enables the users to access the network.

- a) session
- b) application
- c) data link
- d) physical

275. Circuit switching takes place at the ..... layer.

- a) data link
- b) physical
- c) network
- d) transport

276. The ..... layer is responsible for moving frames from one node to the next.

- a) physical
- b) data link
- c) transport
- d) session

277. The routing processor of a router performs the ..... layer functions of the router.

- a) physical and data link
- b) **network**
- c) transport
- d) session

278. The data link layer takes the packet it gets from the network layer and encapsulates them into .....

- a) cells
- b) **frames**
- c) packet
- d) trailer

279. In computer networking the term ..... refers to selecting paths in a computer network along which to send data.

- a) **routing**
- b) inter-networking
- c) internal organization
- d) congestion control

280. ..... is also a static algorithm in which every incoming packet is sent out on every outgoing line except the one it arrives on.

- a) Shortest Path Algorithm
- b) **Flooding**
- c) Distance Vector Routing
- d) Hierarchical Routing

281. ..... is basically a vector that keeps track of best-known distance to each destination and which line to use to get there.

- a) Shortest Path Algorithm
- b) Flooding
- c) **Distance Vector Routing**
- d) Hierarchical Routing

282. In ..... the routers are divided into regions. Each router knows all details about how to route packets to destinations within its own region.

- a) Shortest Path Algorithm
- b) Link state Routing
- c) Distance Vector Routing
- d) **Hierarchical Routing**

283. In ..... each node uses as its fundamental data a map of the network in the form of a graph

- a) Shortest Path Algorithm
- b) **Link state Routing**
- c) Distance Vector Routing
- d) Hierarchical Routing

284. In ..... routing algorithm, each router knows all details about how to route packets to destinations within its own region. But does not have any idea about internal structure of other regions.

- a) Shortest Path Algorithm
- b) Link state Routing
- c) Distance Vector Routing
- d) **Hierarchical Routing**

285. ..... is a simple mathematical computation used to check for bit-level errors in the IPV4 header.

- a) Identification
- b) Protocol
- c) **Checksum**
- d) Time-to-Live(TTL)

286. The task of ..... is to provide reliable, cost effective transport of data from source machine to destination machine.

- a) Network Layer
- b) **Transport Layer**
- c) Presentation Layer
- d) Application Layer

287. A ..... is a special type of file handle, which is used by a process to request network services from the operating system?

- a) **socket**
- b) handler
- c) requester
- d) protocol

288. ..... is an optional 16-bit one's complement of the one's complement sum of a pseudo-IP header, the UDP header, and the UDP data.

- a) Congestion
- b) **Checksum**
- c) Pseudosum
- d) Headersum

289. The process of obtaining zone information across the network is referred to as a .....

- a) zone obtaining
- b) **zone transfer**
- c) zone information
- d) zone extracting

290. In ..... when a name server receives a DNS query that it cannot resolve through its own zone files, it sends a recursive query to its forwarder.

- a) exclusive mode
- b) **non-exclusive mode**
- c) caching mode
- d) zonal mode

291. .... are DNS servers that only perform queries, cache the answers, and return the results.

- a) Querying only server
- b) Results only server
- c) Caching only server
- d) Information only server

292. .... is an electronic mail protocol with both client and server functions?

- a) SMTP
- b) MIME
- c) POP
- d) TCP

293. .... store resource records and information about the domain tree structure and attempt to resolve received client queries.

- a) Domain namespace
- b) DNS Names
- c) Name servers
- d) Resolvers

294. .... are programs that run on DNS clients and DNS servers and that create queries to extract information from name servers.

- a) Domain namespace
- b) Resource records
- c) Name servers
- d) Resolvers

295. In MIME header field, ..... is a plain text description of the object within the body, which is useful when the object is not human-readable.

- a) content-type
- b) content-transfer-encoding
- c) content-description
- d) content-id

296. Which sublayer of the data link layer performs data link functions that depend upon the type of medium?

- a) logical link control sublayer
- b) media access control sublayer
- c) network interface control sublayer
- d) none of the mentioned

297. Header of a frame generally contains

- a) synchronization bytes
- b) addresses
- c) frame identifier
- d) all of the mentioned

298. Which one of the following tasks is not done by data link layer?

- a) framing
- b) error control
- c) flow control
- d) channel coding

299. The field of the Media Access Control frame that is used to alternate the 1s and 0s is called

- a) SFD
- b) preamble
- c) source address
- d) destination address

300. In a/an ..... of DNS resolver, the queried name server is requested to respond with the requested data or with an error stating that data of the requested type or the specified domain name does not exist.

- a) Recursive queries
- b) Iterative queries
- c) Reverse queries
- d) Inverse queries

301. Which transmission media has the highest transmission speed in a network?

- a) coaxial cable
- b) twisted pair cable
- c) optical fiber
- d) electrical cable

302. What is the max data capacity of STP?

- a) 10 mbps
- b) 100 mbps
- c) 1000 mbps
- d) 10000 mbps

303. Bits can be sent over guided and unguided media as analog signal by

- a) digital modulation
- b) amplitude modulation
- c) frequency modulation
- d) phase modulation

304. A single channel is shared by multiple signals by

- a) analog modulation
- b) digital modulation
- c) multiplexing
- d) none of the mentioned

305. How long is an IPv6 address?

- a) 32 bits
- b) 128 bytes
- c) 64 bits
- d) 128 bits

**306. Ethernet frame consists of**

- a) MAC address
- b) IP address
- c) both MAC address and IP address
- d) none of the mentioned

**307. What flavor of Network Address Translation can be used to have one IP address allow many users to connect to the global Internet?**

- a) NAT
- b) Static
- c) Dynamic
- d) PAT

**308. Which multiple access technique is used by IEEE 802.11 standard for wireless LAN?**

- a) CDMA
- b) CSMA/CA
- c) ALOHA
- d) None of the mentioned

**309. Multiplexing is used in**

- a) Packet switching
- b) Circuit switching
- c) Data switching
- d) Packet & Circuit switching

**310. Which multiplexing technique transmits digital signals?**

- a) FDM
- b) TDM
- c) WDM
- d) FDM & WDM

**311. The state when dedicated signals are idle are called**

- a) Death period
- b) Poison period
- c) Silent period
- d) None of the mentioned

**312. Propagation delay depends on**

- a) Packet length
- b) Transmission rate
- c) Distance between the routers
- d) None of the mentioned

**313. Most packet switches use this principle**

- a) Stop and wait
- b) Store and forward
- c) Both Stop and wait and Store and forward
- d) Stop and forward

**314. Bluetooth uses .....**

- a) frequency hopping spread spectrum
- b) orthogonal frequency division multiplexing
- c) time division multiplexing
- d) none of the mentioned

**315. The default connection type used by HTTP is**

- a) Persistent
- b) Non-persistent
- c) Can be either persistent or non-persistent depending on connection request
- d) None of the mentioned

**316. If you have to send multimedia data over SMTP it has to be encoded into**

- a) Binary
- b) Signal
- c) ASCII
- d) None of the mentioned

**317. SSH uses ..... to authenticate the remote computer.**

- a) public-key cryptography
- b) private-key cryptography
- c) any of public-key or private-key
- d) both public-key & private-key

**318. You have 10 users plugged into a hub running 10Mbps half-duplex. There is a server connected to the switch running 10Mbps half-duplex as well. How much bandwidth does each host have to the server?**

- a) 100 kbps
- b) 1 Mbps
- c) 2 Mbps
- d) 10 Mbps

**319. Which of the following is the valid host range for the subnet on which the IP address 192.168.168.188 255.255.255.192 resides?**

- a) 192.168.168.129-190
- b) 192.168.168.129-191
- c) 192.168.168.128-190
- d) 192.168.168.128-192

**320. What protocol does PPP use to identify the Network layer protocol?**

- a) NCP
- b) ISDN
- c) HDLC
- d) LCP

**321. DHCP (dynamic host configuration protocol) provides ..... to the client.**

- a) IP address
- b) MAC address
- c) Url
- d) None of the mentioned

**322. The DHCP server**

- a) maintains a database of available IP addresses
- b) maintains the information about client configuration parameters
- c) grants a IP address when receives a request from a client
- d) all of the mentioned

**323. What is DHCP snooping?**

- a) techniques applied to ensure the security of an existing DHCP infrastructure
- b) encryption of the DHCP server requests
- c) algorithm for DHCP
- d) none of the mentioned

**324. Which protocol does DHCP use at the Transport layer?**

- a) IP
- b) TCP
- c) UDP
- d) ARP

**325. IPsec is designed to provide the security at the**

- a) Transport layer
- b) Network layer
- c) Application layer
- d) Session layer

**326. Which protocol is used to send a destination network unknown message back to originating hosts?**

- a) TCP
- b) ARP
- c) ICMP
- d) BootP

**327. ATM and frame relay are**

- a) virtual circuit networks
- b) datagram networks
- c) virtual private networks
- d) none of the mentioned

**328. ATM uses the**

- a) asynchronous frequency division multiplexing
- b) asynchronous time division multiplexing
- c) asynchronous space division multiplexing
- d) none of the mentioned

**329. Frame relay has error detection at the**

- a) physical layer
- b) data link layer
- c) network layer
- d) transport layer

**330. You have an IP address of 172.16.13.5 with a**

**255.255.255.128 subnet mask. What is your class of address, subnet address, and broadcast address?**

- a) Class A, Subnet 172.16.13.0, Broadcast address 172.16.13.127
- b) Class B, Subnet 172.16.13.0, Broadcast address 172.16.13.127
- c) Class B, Subnet 172.16.13.0, Broadcast address 172.16.13.255
- d) Class B, Subnet 172.16.0.0, Broadcast address 172.16.255.255

**331. If you wanted to have 12 subnets with a Class C network ID, which subnet mask would you use?**

- a) 255.255.255.252
- b) 255.255.255.255
- c) 255.255.255.240
- d) 255.255.255.248

**332. What PPP protocol provides dynamic addressing, authentication, and multilink?**

- a) NCP
- b) HDLC
- c) LCP
- d) X.25

**333. What is a stub network?**

- a) A network with more than one exit point.
- b) A network with more than one exit and entry point.
- c) A network with only one entry and no exit point.
- d) A network that has only one entry and exit point.

**334. The technique in which a congested node stops receiving data from the immediate upstream node or nodes is called as**

- a) Admission policy
- b) Backpressure
- c) Forward signaling
- d) Backward signaling

**335. Which protocol does Ping use?**

- a) TCP
- b) ARP
- c) ICMP
- d) BootP

**336. In the layer hierarchy as the data packet moves from the upper to the lower layers, headers are**

- 
- a) Added
  - b) Removed
  - c) Rearranged
  - d) Modified

337. \_\_\_\_\_ are set of rules that governs data communication.

- a) Protocols
- b) Standards
- c) RFCs
- d) Servers

338. When collection of various computers seems a single coherent system to its client, then it is called \_\_\_\_\_

- a) computer network
- b) distributed system
- c) networking system
- d) mail system

339. Network congestion occurs \_\_\_\_\_

- a) in case of traffic overloading
- b) when a system terminates
- c) when connection between two nodes terminates
- d) in case of transfer failure

340. Which of the following networks extends a private network across public networks?

- a) local area network
- b) virtual private network
- c) enterprise private network
- d) storage area network

341. Which of the following layers is an addition to OSI model when compared with TCP IP model?

- a) Application layer
- b) Presentation layer
- c) Session layer
- d) Session and Presentation layer

342. The functionalities of the presentation layer include \_\_\_\_\_

- a) Data compression
- b) Data encryption
- c) Data description
- d) All of the mentioned

343. The physical layer provides \_\_\_\_\_

- a) mechanical specifications of electrical connectors and cables
- b) electrical specification of transmission line signal level
- c) specification for IR over optical fiber
- d) all of the mentioned

344. The physical layer is responsible for \_\_\_\_\_

- a) line coding
- b) channel coding
- c) modulation
- d) all of the mentioned

345. Wireless transmission of signals can be done via \_\_\_\_\_

- a) radio waves
- b) microwaves
- c) infrared
- d) all of the mentioned

346. Which of the following tasks is not done by data link layer?

- a) framing
- b) error control
- c) flow control
- d) channel coding

347. Header of a frame generally contains \_\_\_\_\_

- a) synchronization bytes
- b) addresses
- c) frame identifier
- d) all of the mentioned

348. Which sublayer of the data link layer performs data link functions that depend upon the type of medium?

- a) logical link control sublayer
- b) media access control sublayer
- c) network interface control sublayer
- d) error control sublayer

349. When 2 or more bits in a data unit has been changed during the transmission, the error is called \_\_\_\_\_

- a) random error
- b) burst error
- c) inverted error
- d) double error

350. Which one of the following algorithm is not used for congestion control?

- a) traffic aware routing
- b) admission control
- c) load shedding
- d) routing information protocol

## Data Structures

1. The logical or mathematical model of a particular organization of data is called a .....
  - a) Data structure
  - b) Data arrangement
  - c) Data configuration
  - d) Data formation
2. Which one of the below mentioned is linear data structure?
  - a) Queue
  - b) Stack
  - c) Arrays
  - d) All of these
3. On which principle does stack work?
  - a) LIFO
  - b) FIFO
  - c) LILO
  - d) None
4. A ..... does not keep track of address of every element in the list.
  - a) Stack
  - b) String
  - c) Linear array
  - d) Queue
5. ..... search starts at the beginning of the list and check every element in the list.
  - a) Binary
  - b) Hash
  - c) Linear
  - d) Binary Tree
6. Which of the following best describes an array?
  - a) A data structure that shows a hierarchical behavior
  - b) Container of objects of similar types
  - c) Arrays are immutable once initialized
  - d) Array is not a data structure
7. When does the `ArrayIndexOutOfBoundsException` occur?
  - a) Compile-time
  - b) Run-time
  - c) Not an error
  - d) Not an exception at all
8. In a stack, if a user tries to remove an element from empty stack it is called \_\_\_\_\_.
  - a) Underflow
  - b) Empty collection
  - c) Overflow
  - d) Garbage Collection
9. What is the best case for linear search?
  - a)  $O(n \log n)$
  - b)  $O(\log n)$
  - c)  $O(n)$
  - d)  $O(1)$
10. Pushing an element into stack already having five elements and stack size of 5, then it is .....
  - a) Overflow
  - b) Crash
  - c) Underflow
  - d) User flow
11. To perform level-order traversal on a binary tree, which of the following data structure will be required?
  - a) Hash table
  - b) Queue
  - c) Binary search tree
  - d) Stack
12. The data structure required to check whether an expression contains balanced parenthesis is?
  - a) Stack
  - b) Queue
  - c) Array
  - d) Tree
13. A binary tree in which all its levels except the last, have maximum numbers of nodes, and all the nodes in the last level have only one child it will be its left child. Name the tree.
  - a) Threaded tree
  - b) Complete binary tree
  - c) M-way search tree
  - d) Full binary tree

- 14. What is the worst case for linear search?**
- a)  $O(n\log n)$
  - b)  $O(\log n)$
  - c)  $O(n)$
  - d)  $O(1)$
- 15. If two trees have same structure and node content, then they are called \_\_\_\_**
- a) Synonyms trees
  - b) Joint trees
  - c) Equivalent trees
  - d) Similar trees
- 16. The time complexity of quicksort is .....**
- a)  $O(n)$
  - b)  $O(n\log n)$
  - c)  $O(n^2)$
  - d)  $O(n \log n)$
- 17. Which of the following application makes use of a circular linked list?**
- a) Undo operation in a text editor
  - b) Recursive function calls
  - c) Allocating CPU to resources
  - d) Implement Hash Tables
- 18. Quick sort is also known as .....**
- a) merge sort
  - b) tree sort
  - c) shell sort
  - d) partition and exchange sort
- 19. The process of accessing data stored in a serial access memory is similar to manipulating data on a.....**
- a) Heap
  - b) Binary Tree
  - c) Array
  - d) Stack
- 20. What is the advantage of recursive approach than an iterative approach?**
- a) Consumes less memory
  - b) Less code and easy to implement
  - c) Consumes more memory
  - d) More code has to be written
- 21. The situation when in a linked list START=NULL is ....**
- a) Underflow
  - b) Overflow
  - c) Houseful
  - d) Saturated
- 22. Which of the following is non-liner data structure?**
- a) Stacks
  - b) List
  - c) Strings
  - d) Trees
- 23. Which data structure is used for implementing recursion?**
- a) Queue
  - b) Stack
  - c) Array
  - d) List
- 24. What is the worst-case complexity of binary search using recursion?**
- a)  $O(n\log n)$
  - b)  $O(\log n)$
  - c)  $O(n)$
  - d)  $O(n^2)$
- 25. Which of the following statements hold true for binary trees?**
- a) The left subtree of a node contains only nodes with keys less than the node's key
  - b) The right subtree of a node contains only nodes with keys greater than the node's key.
  - c) Both
  - d) None
- 26. Binary Search can be categorized into which of the following?**
- a) Brute Force technique
  - b) Divide and conquer
  - c) Greedy algorithm
  - d) Dynamic programming
- 27. The data structure required for Breadth First Traversal on a graph is?**
- a) Stack
  - b) Array
  - c) Queue
  - d) Tree

28. A queue follows \_\_\_\_\_
- a) FIFO (First In First Out) principle
  - b) LIFO (Last In First Out) principle
  - c) Ordered array
  - d) Linear tree
29. Circular Queue is also known as \_\_\_\_\_
- a) Ring Buffer
  - b) Square Buffer
  - c) Rectangle Buffer
  - d) Curve Buffer
30. A data structure in which elements can be inserted or deleted at/from both the ends but not in the middle is?
- a) Queue
  - b) Circular queue
  - c) Dequeue
  - d) Priority queue
31. Which of the following ways below is a pre order traversal?
- a) Root->left sub tree-> right sub tree
  - b) Root->right sub tree-> left sub tree
  - c) right sub tree-> left sub tree->Root
  - d) left sub tree-> right sub tree->Root
32. Queues serve major role in \_\_\_\_\_
- a) Simulation of recursion
  - b) Simulation of arbitrary linked list
  - c) Simulation of limited resource allocation
  - d) Simulation of heap sort
33. Which of the following ways below is a in order traversal?
- a) Root >left sub tree > right sub tree
  - b) Root >right sub tree > left sub tree
  - c) right sub tree > left sub tree >Root
  - d) left sub tree> root >right sub tree
34. With what data structure can a priority queue be implemented?
- a) Array
  - b) List
  - c) Heap
  - d) Tree
35. What is the applications of dequeue?
- a) A-Steal job scheduling algorithm
  - b) Can be used as both stack and queue
  - c) To find the maximum of all sub arrays of size k
  - d) To avoid collision in hash tables
36. Which of the following linked list below have last node of the list pointing to the first node?
- a) circular doubly linked list
  - b) circular linked list
  - c) circular singly linked list
  - d) doubly linked list
37. What is the need for a circular queue?
- a) effective usage of memory
  - b) easier computations
  - c) to delete elements based on priority
  - d) implement LIFO principle in queues
38. Items in a priority queue are entered in a \_\_\_\_\_ order
- a) random
  - b) order of priority
  - c) as and when they come
  - d) none of the above
39. Which data structure allows deleting data elements from front and inserting at rear?
- a) Stacks
  - b) Queues
  - c) Deques
  - d) Binary search tree
40. To represent hierarchical relationship between elements, which data structure is suitable?
- a) Deque
  - b) Priority
  - c) Tree
  - d) All of above
41. A binary tree whose every node has either zero or two children is called
- a) Complete binary tree
  - b) Binary search tree
  - c) Extended binary tree
  - d) None of above

- 42. The depth of a complete binary tree is given by**
- a)  $D_n = n \log 2n$
  - b)  $D_n = n \log 2n+1$
  - c)  $D_n = \log 2n$
  - d)  $D_n = \log 2n+1$
- 43. When converting binary tree into extended binary tree, all the original nodes in binary tree are**
- a) internal nodes on extended tree
  - b) external nodes on extended tree
  - c) vanished on extended tree
  - d) None of above
- 44. Which of the following sorting algorithm is of divide-and-conquer type?**
- a) Bubble sort
  - b) Insertion sort
  - c) Quick sort
  - d) All of above
- 45. An algorithm that calls itself directly or indirectly is known as**
- a) Sub algorithm
  - b) Recursion
  - c) Polish notation
  - d) Traversal algorithm
- 46. In linked lists there are no NULL links in .....**
- a) Single linked list
  - b) Linear doubly linked list
  - c) Circular linked list
  - d) None of the above
- 47. In a Stack the command to access nth element from the top of the stacks will be**
- a)  $S[Top-n]$
  - b)  $S[Top+n]$
  - c)  $S[top-n-1]$
  - d) None of the above
- 48. The total number of comparisons in a bubble sort is**
- a)  $O(n \log n)$
  - b)  $O(2n)$
  - c)  $O(n^2)$
  - d) None of the above
- 49. The dummy header in linked list contains.....**
- a) First record of the actual data
  - b) Last record of the actual data
  - c) Pointer to the last record of the actual data
  - d) None of the above
- 50. Two main measures for the efficiency of an algorithm are**
- a) Processor and memory
  - b) Complexity and capacity
  - c) Time and space
  - d) Data and space
- 51. The time factor when determining the efficiency of algorithm is measured by**
- a) Counting microseconds
  - b) Counting the number of key operations
  - c) Counting the number of statements
  - d) Counting the kilobytes of algorithm
- 52. The space factor when determining the efficiency of algorithm is measured by**
- a) Counting the maximum memory needed by the algorithm
  - b) Counting the minimum memory needed by the algorithm
  - c) Counting the average memory needed by the algorithm
  - d) Counting the maximum disk space needed by the algorithm
- 53. Which of the following case does not exist in complexity theory**
- a) Best case
  - b) Worst case
  - c) Average case
  - d) Null case
- 54. The Worst case occur in linear search algorithm when**
- a) Item is somewhere in the middle of the array
  - b) Item is not in the array at all
  - c) Item is the last element in the array
  - d) Item is the last element in the array or is not there at all
- 55. The Average case occur in linear search algorithm**
- a) When Item is somewhere in the middle of the array
  - b) When Item is not in the array at all
  - c) When Item is the last element in the array
  - d) When Item is the last element in the array or is not there at all

56. The complexity of linear search algorithm is

- a) O(n)
- b) O(log n)
- c) O(n2)
- d) O(n log n)

57. The complexity of Bubble sort algorithm is

- a) O(n)
- b) O(log n)
- c) O(n2)
- d) O(n log n)

58. The operation of processing each element in the list

is known as

- a) Sorting
- b) Merging
- c) Inserting
- d) Traversal

59. Arrays are best data structures

- a) for relatively permanent collections of data
- b) for the size of the structure and the data in the structure are constantly changing
- c) for both of above situation
- d) for none of above situation

60. Linked lists are best suited

- a) for relatively permanent collections of data
- b) for the size of the structure and the data in the structure are constantly changing
- c) for both of above situation
- d) for none of above situation

61. The elements of an array are stored successively in memory cells because

- a) by this way computer can keep track only the address of the first element and the addresses of other elements can be calculated
- b) the architecture of computer memory does not allow arrays to store other than serially
- c) both of above
- d) none of above

62. Value of the first linked list index is \_\_\_\_\_

- a) One
- b) Zero
- c) -1
- d) None of these

63. New nodes are added to the \_\_\_\_\_ of the queue.

- a) front
- b) back
- c) middle
- d) Both 1 and 2

64. A \_\_\_\_\_ is a data structure that organizes data similar to a line in the supermarket, where the first one in line is the first one out.

- a) queue linked list
- b) stacks linked list
- c) both of them
- d) neither of them

65. What happens when you push a new node onto a stack?

- a) the new node is placed at the front of the linked list.
- b) the new node is placed at the back of the linked list.
- c) the new node is placed at the middle of the linked list.
- d) No Changes happens

66. The memory address of the first element of an array is called

- a) floor address
- b) foundation address
- c) first address
- d) base address

67. Which of the following data structures are indexed structures?

- a) linear arrays
- b) linked lists
- c) both of above
- d) none of above

68. Which of the following data structure can't store the non-homogeneous data elements?

- a) Arrays
- b) Records
- c) Pointers
- d) None

69. Which of the following data structure store the homogeneous data elements?

- a) Arrays
- b) Records
- c) Pointers
- d) None

70. In the ..... traversal we process all of a vertex's descendants before we move to an adjacent vertex.
- a) Depth Limited
  - b) With First
  - c) Breadth First
  - d) Depth First
71. Which of the following data structure is nonlinear type?
- a) Strings
  - b) Lists
  - c) Stacks
  - d) Graph
72. Which of the following data structure is linear type?
- a) Graph
  - b) Trees
  - c) Binary tree
  - d) Stack
73. What will be the value of top, if there is a size of stack [STACK\_SIZE is 5]
- a) 5
  - b) 6
  - c) 4
  - d) None
74. There is an extra element at the head of the list called a .....
- a) Antennal
  - b) Sentinel
  - c) List header
  - d) List head
75. In general, the binary search method needs no more than ..... comparisons.
- a)  $\lceil \log_2 n \rceil - 1$
  - b)  $\lceil \log n \rceil + 1$
  - c)  $\lceil \log_2 n \rceil$
  - d)  $\lceil \log_2 n \rceil + 1$
76. Any node is the path from the root to the node is called
- a) Successor node
  - b) Ancestor node
  - c) Internal node
  - d) None of the above
77. In a priority queue, insertion and deletion takes place at .....
- a) front, rear end
  - b) only at rear end
  - c) only at front end
  - d) any position
78. In order to get the contents of a Binary search tree in ascending order, one has to traverse it in .....
- a) pre-order
  - b) in-order
  - c) post order
  - d) not possible
79. Time required to merge two sorted lists of size m and n, is .....
- a)  $O(m + n)$
  - b)  $O(m + n)$
  - c)  $O(m \log n)$
  - d)  $O(n \log m)$
80. The goal of hashing is to produce a search that takes .....
- a)  $O(1)$  time
  - b)  $O(n^2)$  time
  - c)  $O(\log n)$  time
  - d)  $O(n \log n)$  time
81. Quick sort running time depends on the selection of .....
- a) size of array
  - b) pivot element
  - c) sequence of values
  - d) none of the above
82. Which of the following sorting methods would be most suitable for sorting a list which is almost sorted?
- a) Bubble Sort
  - b) Insertion Sort
  - c) Selection Sort
  - d) Quick Sort

83. Minimum number of moves required to solve a

Tower of Hanoi puzzle is .....

- a)  $2^n2$
- b)  $n-1$
- c)  $2n - 1$
- d)  $2n - 2$

84. One can convert a binary tree into its mirror image by traversing it in

- a) in-order
- b) pre-order
- c) post-order
- d) any order

85. Which of the following is an example of dynamic programming approach?

- a) Fibonacci Series
- b) Tower of Hanoi
- c) Dijkstra's Shortest Path
- d) All of the above

86. The  $\Theta$  notation in asymptotic evaluation represents

.....

- a) Base case
- b) Average case
- c) Worst case
- d) NULL case

87. A full binary tree with  $n$  leaves contains .....

- a)  $n$  nodes
- b)  $\log n^2$  nodes
- c)  $2n - 1$  nodes
- d)  $2n$  nodes

88. Linked lists are not suitable data structures for which one of the following problems?

- a) Insertion sort
- b) Binary search
- c) Radix sort
- d) Polynomial manipulation

89. Which of the following types of expressions do not require precedence rules for evaluation?

- a) fully parenthesized infix expression
- b) postfix expression
- c) partially parenthesized infix expression
- d) more than one of the above

90. What data structure is used for breadth first traversal of a graph?

- a) Queue
- b) Stack
- c) List
- d) None of these

91. Program with highest run-time complexity is

.....

- a) Tower of Hanoi
- b) Fibonacci Series
- c) Prime Number Series
- d) None of these

92. Which of the following is an application of stack?

- a) finding factorial
- b) tower of Hanoi
- c) infix to postfix conversion
- d) all of the above

93. The disadvantage in using a circular linked list is.....

- a) It is possible to get into infinite loop.
- b) Last node points to first node.
- c) Time consuming
- d) Requires more memory space

94. When does top value of the stack changes?

- a) Before deletion
- b) While checking underflow
- c) At the time of deletion
- d) After deletion

95. In a queue, the initial values of front pointer f rare pointer r should be ..... and ..... respectively.

- a) 0 and 1
- b) 0 and -1
- c) -1 and 0
- d) 1 and 0

- 96. Where is linear searching used?**
- a) When the list has only a few elements
  - b) When performing a single search in an unordered list
  - c) Used all the time
  - d) When the list has only a few elements and When performing a single search in an unordered list**
- 97. Which of the following is a disadvantage of linear search?**
- a) Requires more space
  - b) Greater time complexities compared to other searching algorithms**
  - c) Not easy to understand
  - d) Not easy to implement
- 98. Given an input arr = {2,5,7,99,899}; key = 899; What is the level of recursion?**
- a) 5
  - b) 2
  - c) 3**
  - d) 4
- 99. What is the worst case complexity of binary search using recursion?**
- a)  $O(n\log n)$
  - b)  $O(\log n)$**
  - c)  $O(n)$
  - d)  $O(n^2)$
- 100. Choose the recursive formula for the Fibonacci series.( $n \geq 1$ )**
- a)  $F(n) = F(n+1) + F(n+2)$
  - b)  $F(n) = F(n) + F(n+1)$
  - c)  $F(n) = F(n-1) + F(n-2)$**
  - d)  $F(n) = F(n-1) - F(n-2)$

Algorithm	Best Time Complexity	Average Time Complexity	Worst Time Complexity	Worst Space Complexity
Linear Search	$O(1)$	$O(n)$	$O(n)$	$O(1)$
Binary Search	$O(1)$	$O(\log n)$	$O(\log n)$	$O(1)$
Bubble Sort	$O(n)$	$O(n^2)$	$O(n^2)$	$O(1)$
Selection Sort	$O(n^2)$	$O(n^2)$	$O(n^2)$	$O(1)$
Insertion Sort	$O(n)$	$O(n^2)$	$O(n^2)$	$O(1)$
Merge Sort	$O(n\log n)$	$O(n\log n)$	$O(n\log n)$	$O(n)$
Quick Sort	$O(n\log n)$	$O(n\log n)$	$O(n^2)$	$O(\log n)$
Heap Sort	$O(n\log n)$	$O(n\log n)$	$O(n\log n)$	$O(n)$
Bucket Sort	$O(n+k)$	$O(n+k)$	$O(n^2)$	$O(n)$
Radix Sort	$O(nk)$	$O(nk)$	$O(nk)$	$O(n+k)$
Tim Sort	$O(n)$	$O(n\log n)$	$O(n\log n)$	$O(n)$
Shell Sort	$O(n)$	$O((n\log(n))^2)$	$O((n\log(n))^2)$	$O(1)$

## Algorithm Analysis

1. Which of the following algorithm implementations is similar to that of an insertion sort?
  - a) Binary heap
  - b) Quick sort
  - c) Merge sort
  - d) Radix sort
2. What is the average case running time of an insertion sort algorithm?
  - a)  $O(N)$
  - b)  $O(N \log N)$
  - c)  $O(\log N)$
  - d)  $O(N^2)$
3. What will be the number of passes to sort the elements using insertion sort?  
**14, 12, 16, 6, 3, 10**
  - a) 6
  - b) 5
  - c) 7
  - d) 1
4. Which of the following real time examples is based on insertion sort?
  - a) arranging a pack of playing cards
  - b) database scenarios and distributes scenarios
  - c) arranging books on a library shelf
  - d) real-time systems
5. Which of the following sorting algorithms is the fastest for sorting small arrays?
  - a) Quick sort
  - b) Insertion sort
  - c) Shell sort
  - d) Heap sort
6. In the following scenarios, when will you use selection sort?
  - a) The input is already sorted
  - b) A large file has to be sorted
  - c) Large values need to be sorted with small keys
  - d) Small values need to be sorted with large keys
7. What is the worst-case complexity of selection sort?
  - a)  $O(n \log n)$
  - b)  $O(\log n)$
  - c)  $O(n)$
  - d)  $O(n^2)$
8. Which of the following is not a stable sorting algorithm?
  - a) Quick sort
  - b) Cocktail sort
  - c) Bubble sort
  - d) Merge sort
9. Which of the following stable sorting algorithm takes the least time when applied to an almost sorted array?
  - a) Quick sort
  - b) Insertion sort
  - c) Selection sort
  - d) Merge sort
10. Which of the following sorting algorithms is the fastest?
  - a) Merge sort
  - b) Quick sort
  - c) Insertion sort
  - d) Shell sort
11. What is the average running time of a quick sort algorithm?
  - a)  $O(N^2)$
  - b)  $O(N)$
  - c)  $O(N \log N)$
  - d)  $O(\log N)$
12. Which of the following sorting algorithms is used along with quick sort to sort the sub arrays?
  - a) Merge sort
  - b) Shell sort
  - c) Insertion sort
  - d) Bubble sort

13. **Shell sort algorithm is an example of?**
- a) External sorting
  - b) Internal sorting
  - c) In-place sorting
  - d) Bottom-up sorting
14. **Which of the following sorting algorithms is closely related to shell sort?**
- a) Selection sort
  - b) Merge sort
  - c) Insertion sort
  - d) Bucket sort
15. **Why is Shell sort called as a generalization of Insertion sort?**
- a) Shell sort allows an exchange of far items whereas insertion sort moves elements by one position
  - b) Improved lower bound analysis
  - c) Insertion is more efficient than any other algorithms
  - d) Shell sort performs internal sorting
16. **On which algorithm is heap sort based on?**
- a) Fibonacci heap
  - b) Binary tree
  - c) Priority queue
  - d) FIFO
17. **How many comparisons will be made to sort the array arr={1, 5, 3, 8, 2} using bucket sort?**
- a) 5
  - b) 7
  - c) 9
  - d) 0
18. **Bucket sort is most efficient in the case when**
- a) the input is non-uniformly distributed
  - b) the input is uniformly distributed
  - c) the input is randomly distributed
  - d) the input range is large
19. **What is the worst case time complexity of bucket sort ( $k = \text{number of buckets}$ )?**
- a)  $O(n + k)$
  - b)  $O(n.k)$
  - c)  $O(n^2)$
  - d)  $O(n \log n)$
20. **Depth First Search is equivalent to which of the traversals in the Binary Trees?**
- a) Pre-order Traversal
  - b) Post-order Traversal
  - c) Level-order Traversal
  - d) In-order Traversal
21. **Which of the following is not an application of Depth First Search?**
- a) For generating topological sort of a graph
  - b) For generating Strongly Connected Components of a directed graph
  - c) Detecting cycles in the graph
  - d) Peer to Peer Networks
22. **When the Depth First Search of a graph is unique?**
- a) When the graph is a Binary Tree
  - b) When the graph is a Linked List
  - c) When the graph is a n-ary Tree
  - d) When the graph is a ternary Tree
23. **In Depth First Search, how many times a node is visited?**
- a) Once
  - b) Twice
  - c) Equivalent to number of indegree of the node
  - d) Thrice
24. **Breadth First Search is equivalent to which of the traversals in the Binary Trees?**
- a) Pre-order Traversal
  - b) Post-order Traversal
  - c) Level-order Traversal
  - d) In-order Traversal
25. **Time Complexity of Breadth First Search is? (V number of vertices, E number of edges)**
- a)  $O(V + E)$
  - b)  $O(V)$
  - c)  $O(E)$
  - d)  $O(V * E)$
26. **Which of the following is false in the case of a spanning tree of a graph G?**
- a) It is tree that spans G
  - b) It is a subgraph of the G
  - c) It includes every vertex of the G
  - d) It can be either cyclic or acyclic

27. Kruskal's algorithm is used to \_\_\_\_\_
- a) find minimum spanning tree
  - b) find single source shortest path
  - c) find all pair shortest path algorithm
  - d) traverse the graph
28. Which of the following is true?
- a) Prim's algorithm initializes with a vertex
  - b) Prim's algorithm initializes with a edge
  - c) Prim's algorithm initializes with a vertex which has smallest edge
  - d) Prim's algorithm initializes with a forest
29. Dijkstra's Algorithm is used to solve \_\_\_\_\_ problems.
- a) All pair shortest path
  - b) Single source shortest path
  - c) Network flow
  - d) Sorting
30. Dijkstra's Algorithm cannot be applied on \_\_\_\_\_
- a) Directed and weighted graphs
  - b) Graphs having negative weight function
  - c) Unweighted graphs
  - d) Undirected and unweighted graphs
31. Floyd Warshall's Algorithm is used for solving \_\_\_\_\_
- a) All pair shortest path problems
  - b) Single Source shortest path problems
  - c) Network flow problems
  - d) Sorting problems
32. What approach is being followed in Floyd Warshall Algorithm?
- a) Greedy technique
  - b) Dynamic Programming
  - c) Linear Programming
  - d) Backtracking
33. What procedure is being followed in Floyd Warshall Algorithm?
- a) Top down
  - b) Bottom up
  - c) Big bang
  - d) Sandwich
34. The Bellman Ford algorithm returns \_\_\_\_\_ value.
- a) Boolean
  - b) Integer
  - c) String
  - d) Double
35. Bellman ford algorithm provides solution for \_\_\_\_\_ problems.
- a) All pair shortest path
  - b) Sorting
  - c) Network flow
  - d) Single source shortest path
36. How many solution/solutions are available for a graph having negative weight cycle?
- a) One solution
  - b) Two solutions
  - c) No solution
  - d) Infinite solutions
37. Bellmann Ford Algorithm can be applied for \_\_\_\_\_
- a) Undirected and weighted graphs
  - b) Undirected and unweighted graphs
  - c) Directed and weighted graphs
  - d) All directed graphs
38. Recursion is a method in which the solution of a problem depends on \_\_\_\_\_
- a) Larger instances of different problems
  - b) Larger instances of the same problem
  - c) Smaller instances of the same problem
  - d) Smaller instances of different problems
39. Which of the following problems can't be solved using recursion?
- a) Factorial of a number
  - b) Nth fibonacci number
  - c) Length of a string
  - d) Problems without base case
40. Which of the following recursive formula can be used to find the factorial of a number?
- a)  $\text{fact}(n) = n * \text{fact}(n)$
  - b)  $\text{fact}(n) = n * \text{fact}(n+1)$
  - c)  $\text{fact}(n) = n * \text{fact}(n-1)$
  - d)  $\text{fact}(n) = n * \text{fact}(1)$

41. Which of the following recurrence relations can be used to find the nth Fibonacci number?
- a)  $F(n) = F(n) + F(n - 1)$
  - b)  $F(n) = F(n) + F(n + 1)$
  - c)  $F(n) = F(n - 1)$
  - d)  $F(n) = F(n - 1) + F(n - 2)$
42. Fractional knapsack problem is also known as \_\_\_\_\_
- a) 0/1 knapsack problem
  - b) Continuous knapsack problem
  - c) Divisible knapsack problem
  - d) Non-continuous knapsack problem
43. What is the objective of the knapsack problem?
- a) To get maximum total value in the knapsack
  - b) To get minimum total value in the knapsack
  - c) To get maximum weight in the knapsack
  - d) To get minimum weight in the knapsack
44. Which of the following algorithms is the best approach for solving Huffman codes?
- a) exhaustive search
  - b) greedy algorithm
  - c) brute force algorithm
  - d) divide and conquer algorithm
45. Which of the problems cannot be solved by backtracking method?
- a) n-queen problem
  - b) subset sum problem
  - c) Hamiltonian circuit problem
  - d) travelling salesman problem
46. Backtracking algorithm is implemented by constructing a tree of choices called as?
- a) State-space tree
  - b) State-chart tree
  - c) Node tree
  - d) Backtracking tree
47. Which one of the following is an application of the backtracking algorithm?
- a) Finding the shortest path
  - b) Finding the efficient quantity to shop
  - c) Ludo
  - d) Crossword
48. The problem of placing n queens in a chessboard such that no two queens attack each other is called as?
- a) n-queen problem
  - b) eight queens puzzle
  - c) four queens puzzle
  - d) 1-queen problem
49. In how many directions do queens attack each other in n queens problem?
- a) 1
  - b) 2
  - c) 3
  - d) 4
50. Where is the n-queens problem implemented?
- a) carom
  - b) chess
  - c) ludo
  - d) cards
51. Which of the following methods can be used to solve n-queen's problem?
- a) greedy algorithm
  - b) divide and conquer
  - c) iterative improvement
  - d) backtracking
52. If a problem can be solved by combining optimal solutions to non-overlapping problems, the strategy is called \_\_\_\_\_
- a) Dynamic programming
  - b) Greedy
  - c) Divide and conquer
  - d) Recursion
53. A graph in which all vertices have equal degree is known as \_\_\_\_\_
- a) Complete graph
  - b) Regular graph
  - c) Multi graph
  - d) Simple graph
54. A vertex of in-degree zero in a directed graph is called a/an
- a) Root vertex
  - b) Isolated vertex
  - c) Sink
  - d) Articulation point

- 55. A graph is a tree if and only if graph is**
- a) Directed graph
  - b) Contains no cycles
  - c) Planar
  - d) Completely connected
- 56. .... sorting is good to use when alphabetizing a large list of names.**
- a) Merge
  - b) Heap
  - c) Radix
  - d) Bubble
- 57. What is the advantage of recursive approach than an iterative approach?**
- a) Consumes less memory
  - b) Less code and easy to implement
  - c) Consumes more memory
  - d) More code has to be written
- 58. AVL trees have a faster \_\_\_\_\_**
- a) Insertion
  - b) Deletion
  - c) Updating
  - d) Retrieval
- 59. What is the worst-case complexity of binary search using recursion?**
- a)  $O(n \log n)$
  - b)  $O(\log n)$
  - c)  $O(n)$
  - d)  $O(n^2)$
- 60. Binary Search can be categorized into which of the following?**
- a) Brute Force technique
  - b) Divide and conquer
  - c) Greedy algorithm
  - d) Dynamic programming
- 61. The data structure required for Breadth First Traversal on a graph is?**
- a) Stack
  - b) Array
  - c) Queue
  - d) Tree
- 62. What is an external sorting algorithm?**
- a) Algorithm that uses tape or disk during the sort
  - b) Algorithm that uses main memory during the sort
  - c) Algorithm that involves swapping
  - d) Algorithm that are considered ‘in place’
- 63. What is an internal sorting algorithm?**
- a) Algorithm that uses tape or disk during the sort
  - b) Algorithm that uses main memory during the sort
  - c) Algorithm that involves swapping
  - d) Algorithm that are considered ‘in place’
- 64. What is the peculiarity of red black trees?**
- a) In red-black trees, the root do not contain data.
  - b) In red-black trees, the leaf nodes are not relevant and do not contain data.
  - c) In red-black trees, the leaf nodes are relevant but do not contain data.
  - d) Both a and c above
- 65. What is the advantage of selection sort over other sorting techniques?**
- a) It requires no additional storage space
  - b) It is scalable
  - c) It works best for inputs which are already sorted
  - d) It is faster than any other sorting technique
- 66. Shell sort is also known as \_\_\_\_\_**
- a) diminishing decrement sort
  - b) diminishing increment sort
  - c) partition exchange sort
  - d) diminishing insertion sort
- 67. Shell sort is an improvement on \_\_\_\_\_**
- a) insertion sort
  - b) selection sort
  - c) binary tree sort
  - d) quick sort
- 68. Which of the following is the distribution sort?**
- a) Heap sort
  - b) Smooth sort
  - c) Quick sort
  - d) LSD radix sort
- 69. Key value pair is usually seen in**
- a) Hash tables
  - b) Heaps
  - c) Both a and b
  - d) Skip list
- 70. In a heap, element with the greatest key is always in the \_\_\_\_\_ node.**
- a) leaf
  - b) root
  - c) first node of left sub tree
  - d) first node of right sub tree
- 71. In \_\_\_\_\_ tree, the heights of the two child subtrees of any node differ by at most one**
- a) Binary
  - b) Red black
  - c) Splay
  - d) AVL

- 72. Which data structure allows deleting data elements from front and inserting at rear?**
- a) Stacks
  - b) Queues
  - c) Deques
  - d) Binary search tree
- 73. To represent hierarchical relationship between elements, which data structure is suitable?**
- a) Deque
  - b) Priority
  - c) Tree
  - d) All of above
- 74. Which of the following sorting algorithm is of divide-and-conquer type?**
- a) Bubble sort
  - b) Insertion sort
  - c) Quick sort
  - d) All of above
- 75. An algorithm that calls itself directly or indirectly is known as**
- a) Sub algorithm
  - b) Recursion
  - c) Polish notation
  - d) Traversal algorithm
- 76. In a Heap tree**
- a) Values in a node is greater than every value in left sub tree and smaller than right sub tree
  - b) Values in a node is greater than every value in children of it
  - c) Both of above conditions applies
  - d) None of above conditions applies
- 77. If every node u in G is adjacent to every other node v in G, A graph is said to be**
- a) isolated
  - b) complete
  - c) finite
  - d) strongly connected
- 78. Two main measures for the efficiency of an algorithm are**
- a) Processor and memory
  - b) Complexity and capacity
  - c) Time and space
  - d) Data and space
- 79. The time factor when determining the efficiency of algorithm is measured by**
- a) Counting microseconds
  - b) Counting the number of key operations
  - c) Counting the number of statements
  - d) Counting the kilobytes of algorithm
- 80. The space factor when determining the efficiency of algorithm is measured by**
- a) Counting the maximum memory needed by the algorithm
  - b) Counting the minimum memory needed by the algorithm
  - c) Counting the average memory needed by the algorithm
  - d) Counting the maximum disk space needed by the algorithm
- 81. The complexity of merge sort algorithm is**
- a)  $O(n)$
  - b)  $O(\log n)$
  - c)  $O(n^2)$
  - d)  $O(n \log n)$
- 82. In the ..... traversal we process all of a vertex's descendants before we move to an adjacent vertex.**
- a) Depth Limited
  - b) With First
  - c) Breadth First
  - d) Depth First
- 83. A directed graph is ..... if there is a path from each vertex to every other vertex in the digraph.**
- a) Weakly connected
  - b) Strongly Connected
  - c) Tightly Connected
  - d) Linearly Connected
- 84. Which of the following is not the internal sort?**
- a) Insertion Sort
  - b) Bubble Sort
  - c) Merge Sort
  - d) Heap Sort
- 85. A graph is said to be ..... if the vertices can be split into two sets  $V_1$  and  $V_2$  such there are no edges between two vertices of  $V_1$  or two vertices of  $V_2$ .**
- a) Partite
  - b) Bipartite
  - c) Rooted
  - d) Bisects
- 86. One can convert a binary tree into its mirror image by traversing it in**
- a) in-order
  - b) pre-order
  - c) post-order
  - d) any order
- 87. Which of the following is an example of dynamic programming approach?**
- a) Fibonacci Series
  - b) Tower of Hanoi
  - c) Dijkstra's Shortest Path
  - d) All of the above

88. In a min heap.....
- a) minimum values are stored.
  - b) child nodes have less value than parent nodes.
  - c) parent nodes have less value than child nodes.
  - d) maximum value is contained by the root node.
89. A technique for direct search is .....
- a) Binary Search
  - b) Linear Search
  - c) Tree Search
  - d) Hashing
90. A graph 'G' with 'n' nodes is bipartite if it contains .....
- a) n edges
  - b) a cycle of odd length
  - c) no cycle of odd length
  - d) n2 edges
91. Which of the following is a difference between vectors and arrays?
- a) Access to any element using the [] operator.
  - b) Stored in contiguous blocks of memory.
  - c) The ability to change size dynamically.
  - d) Efficient direct access to any element.
92. Which of the following uses memorization?
- a) Greedy approach
  - b) Divide and conquer approach
  - c) Dynamic programming approach
  - d) None of the above
93. Travelling salesman problem is an example of .....
- a) Dynamic Algorithm
  - b) Greedy Algorithm
  - c) Recursive Approach
  - d) Divide & Conquer
94. The spanning tree of connected graph with 10 vertices contains.....
- a) 9 edges
  - b) 11 edges
  - c) 10 edges
  - d) 9 vertices
95. Given an input arr = {2,5,7,99,899}; key = 899;  
What is the level of recursion?
- a) 5
  - b) 2
  - c) 3
  - d) 4
96. Choose the recursive formula for the Fibonacci series.( $n \geq 1$ )
- a)  $F(n) = F(n+1) + F(n+2)$
  - b)  $F(n) = F(n) + F(n+1)$
  - c)  $F(n) = F(n-1) + F(n-2)$
  - d)  $F(n) = F(n-1) - F(n-2)$
97. Given an array arr = {45,77,89,90,94,99,100} and key = 99; what are the mid values(corresponding array elements) in the first and second levels of recursion?
- a) 90 and 99
  - b) 90 and 94
  - c) 89 and 99
  - d) 89 and 94
98. Which of the following sorting algorithm is stable?
- a) Heap sort
  - b) Selection sort
  - c) In-place MSD radix sort
  - d) LSD radix sort
99. ..... is combining the records in two different sorted files in to a single sorted file.
- a) Sorting.
  - b) Searching.
  - c) Listing.
  - d) Merging.
100. What is an AVL tree?
- a) a tree which is balanced and is a height balanced tree
  - b) a tree which is unbalanced and is a height balanced tree
  - c) a tree with three children
  - d) a tree with atmost 3 children

## Operating System MCQ

- 1. What is an operating system?**
  - a) collection of programs that manages hardware resources
  - b) system service provider to the application programs
  - c) interface between the hardware and application programs
  - d) all of the mentioned
  
- 2. Whenever a process needs I/O to or from a disk it issues a \_\_\_\_\_**
  - a) system call to the CPU
  - b) system call to the operating system
  - c) a special procedure
  - d) all of the mentioned
  
- 3. By operating system, the resource management can be done via \_\_\_\_\_**
  - a) time division multiplexing
  - b) space division multiplexing
  - c) time and space division multiplexing
  - d) none of the mentioned
  
- 4. A “glue” between client and server parts of application is.....**
  - a) Middleware
  - b) Firmware
  - c) Package
  - d) System Software
  
- 5. What is interprocess communication?**
  - a) communication within the process
  - b) communication between two process
  - c) communication between two threads of same process
  - d) none of the mentioned
  
- 6. What is the degree of multiprogramming?**
  - a) the number of processes executed per unit time
  - b) the number of processes in the ready queue
  - c) the number of processes in the I/O queue
  - d) the number of processes in memory
  
- 7. Which one of the following is a synchronization tool?**
  - a) thread
  - b) pipe
  - c) semaphore
  - d) socket
  
- 8. Remote Procedure Calls are used \_\_\_\_\_**
  - a) for communication between two processes remotely different from each other on the same system
  - b) for communication between two processes on the same system
  - c) for communication between two processes on separate systems
  - d) none of the mentioned
  
- 9. The initial program that is run when the computer is powered up is called \_\_\_\_\_**
  - a) boot program
  - b) bootloader
  - c) initializer
  - d) bootstrap program
  
- 10. Which one of the following can not be scheduled by the kernel?**
  - a) kernel level thread
  - b) user level thread
  - c) process
  - d) none of the mentioned
  
- 11. What is Dispatch latency?**
  - a) the speed of dispatching a process from running to the ready state
  - b) the time of dispatching a process from running to ready state and keeping the CPU idle
  - c) the time to stop one process and start running another one
  - d) none of the mentioned
  
- 12. A software that lies between the OS and the applications running on it.**
  - a) Firmware
  - b) Middleware
  - c) Utility Software
  - d) Application Software
  
- 13. The \_\_\_\_\_ calls certain procedures on remote systems and is used to perform synchronous or asynchronous interactions between systems.**
  - a) Procedure
  - b) RPC
  - c) Message Oriented
  - d) DB
  
- 14. Which module gives control of the CPU to the process selected by the short-term scheduler?**
  - a) dispatcher
  - b) interrupt
  - c) scheduler
  - d) none of the mentioned
  
- 15. The processes that are residing in main memory and are ready and waiting to execute are kept on a list called \_\_\_\_\_**
  - a) job queue
  - b) ready queue
  - c) execution queue
  - d) process queue

- 16. The interval from the time of submission of a process to the time of completion is termed as \_\_\_\_\_**
- a) waiting time
  - b) **turnaround time**
  - c) response time
  - d) throughput
- 17. Which scheduling algorithm allocates the CPU first to the process that requests the CPU first?**
- a) **first-come, first-served scheduling**
  - b) shortest job scheduling
  - c) priority scheduling
  - d) none of the mentioned
- 18. In priority scheduling algorithm\_\_\_\_\_**
- a) **CPU is allocated to the process with highest priority**
  - b) CPU is allocated to the process with lowest priority
  - c) Equal priority processes cannot be scheduled
  - d) None of the mentioned
- 19. In priority scheduling algorithm, when a process arrives at the ready queue, its priority is compared with the priority of \_\_\_\_\_**
- a) all process
  - b) **currently running process**
  - c) parent process
  - d) in it process
- 20. Which algorithm is defined in Time quantum?**
- a) shortest job scheduling algorithm
  - b) **round robin scheduling algorithm**
  - c) priority scheduling algorithm
  - d) multilevel queue scheduling algorithm
- 21. Which one of the following cannot be scheduled by the kernel?**
- a) kernel level thread
  - b) **user level thread**
  - c) process
  - d) none of the mentioned
- 22. CPU scheduling is the basis of \_\_\_\_\_**
- a) multiprocessor systems
  - b) **multiprogramming operating systems**
  - c) larger memory sized systems
  - d) none of the mentioned
- 23. With multiprogramming \_\_\_\_\_ is used productively.**
- a) **time**
  - b) space
  - c) money
  - d) all of the mentioned
- 24. What are the two steps of a process execution?**
- a) I/O & OS Burst
  - b) **CPU & I/O Burst**
  - c) Memory & I/O Burst
  - d) OS & Memory Burst
- 25. A process is selected from the \_\_\_\_\_ queue by the \_\_\_\_\_ scheduler, to be executed.**
- a) blocked, short term
  - b) wait, long term
  - c) **ready, short term**
  - d) ready, long term
- 26. Scheduling is done to \_\_\_\_\_**
- a) **increase CPU utilization**
  - b) decrease CPU utilization
  - c) keep the CPU more idle
  - d) none of the mentioned
- 27. What is Turnaround time?**
- a) the total waiting time for a process to finish execution
  - b) the total time spent in the ready queue
  - c) the total time spent in the running queue
  - d) **the total time from the completion till the submission of a process**
- 28. What is Waiting time?**
- a) the total time in the blocked and waiting queues
  - b) **the total time spent in the ready queue**
  - c) the total time spent in the running queue
  - d) the total time from the completion till the submission of a process
- 29. What is Response time?**
- a) the total time taken from the submission time till the completion time
  - b) **the total time taken from the submission time till the first response is produced**
  - c) the total time taken from submission time till the response is output
  - d) none of the mentioned
- 30. Round robin scheduling falls under the category of \_\_\_\_\_**
- a) Non-preemptive scheduling
  - b) **Preemptive scheduling**
  - c) All of the mentioned
  - d) None of the mentioned
- 31. The strategy of making processes that are logically runnable to be temporarily suspended is called \_\_\_\_\_**
- a) Non preemptive scheduling
  - b) **Preemptive scheduling**
  - c) Shortest job first
  - d) First come First served

- 32. Which of the following algorithms tends to minimize the process flow time?**
- a) First come First served
  - b) Shortest Job First
  - c) Earliest Deadline First
  - d) Longest Job First
- 33. Which is the most optimal scheduling algorithm?**
- a) FCFS – First come First served
  - b) SJF – Shortest Job First
  - c) RR – Round Robin
  - d) None of the mentioned
- 34. The real difficulty with SJF in short term scheduling is \_\_\_\_\_**
- a) it is too good an algorithm
  - b) knowing the length of the next CPU request
  - c) it is too complex to understand
  - d) none of the mentioned
- 35. What is ‘Aging’?**
- a) keeping track of cache contents
  - b) keeping track of what pages are currently residing in memory
  - c) keeping track of how many times a given page is referenced
  - d) increasing the priority of jobs to ensure termination in a finite time
- 36. A solution to the problem of indefinite blockage of low priority processes is \_\_\_\_\_**
- a) Starvation
  - b) Wait queue
  - c) Ready queue
  - d) Aging
- 37. Which of the following scheduling algorithms gives minimum average waiting time?**
- a) FCFS
  - b) SJF
  - c) Round – robin
  - d) Priority
- 38. To access the services of operating system, the interface is provided by the \_\_\_\_\_**
- a) System calls
  - b) API
  - c) Library
  - d) Assembly instructions
- 39. If a process fails, most operating system write the error information to a \_\_\_\_\_**
- a) log file
  - b) another running process
  - c) new file
  - d) none of the mentioned
- 40. What is the ready state of a process?**
- a) when process is scheduled to run after some execution
  - b) when process is unable to run until some task has been completed
  - c) when process is using the CPU
  - d) none of the mentioned
- 41. The address of the next instruction to be executed by the current process is provided by the \_\_\_\_\_**
- a) CPU registers
  - b) Program counter
  - c) Process stack
  - d) Pipe
- 42. The number of processes completed per unit time is known as \_\_\_\_\_**
- a) Output
  - b) Throughput
  - c) Efficiency
  - d) Capacity
- 43. The state of a process is defined by \_\_\_\_\_**
- a) the final activity of the process
  - b) the activity just executed by the process
  - c) the activity to next be executed by the process
  - d) the current activity of the process
- 44. Which of the following is not the state of a process?**
- a) New
  - b) Old
  - c) Waiting
  - d) Running
- 45. A single thread of control allows the process to perform \_\_\_\_\_**
- a) only one task at a time
  - b) multiple tasks at a time
  - c) only two tasks at a time
  - d) all of the mentioned
- 46. Which of the following do not belong to queues for processes?**
- a) Job Queue
  - b) PCB queue
  - c) Device Queue
  - d) Ready Queue
- 47. What will happen when a process terminates?**
- a) It is removed from all queues
  - b) It is removed from all, but the job queue
  - c) Its process control block is de-allocated
  - d) Its process control block is never deallocated

**48. What is a long-term scheduler?**

- a) It selects processes which have to be brought into the ready queue
- b) It selects processes which have to be executed next and allocates CPU
- c) It selects processes which have to remove from memory by swapping
- d) None of the mentioned

**49. What is a medium-term scheduler?**

- a) It selects which process has to be brought into the ready queue
- b) It selects which process has to be executed next and allocates CPU
- c) It selects which process to remove from memory by swapping
- d) None of the mentioned

**50. What is a short-term scheduler?**

- a) It selects which process has to be brought into the ready queue
- b) It selects which process has to be executed next and allocates CPU
- c) It selects which process to remove from memory by swapping
- d) None of the mentioned

**51. The primary distinction between the short term scheduler and the long term scheduler is \_\_\_\_\_**

- a) The length of their queues
- b) The type of processes they schedule
- c) The frequency of their execution
- d) None of the mentioned

**52. The only state transition that is initiated by the user process itself is \_\_\_\_\_**

- a) block
- b) wakeup
- c) dispatch
- d) none of the mentioned

**53. In a time-sharing operating system, when the time slot given to a process is completed, the process goes from the running state to the \_\_\_\_\_**

- a) Blocked state
- b) Ready state
- c) Suspended state
- d) Terminated state

**54. In a multiprogramming environment \_\_\_\_\_**

- a) the processor executes more than one process at a time
- b) the programs are developed by more than one person
- c) more than one process resides in the memory
- d) a single user can execute many programs at the same time

**55. Suppose that a process is in “Blocked” state waiting for some I/O service. When the service is completed, it goes to the \_\_\_\_\_**

- a) Running state
- b) Ready state
- c) Suspended state
- d) Terminated state

**56. When several processes access the same data concurrently and the outcome of the execution depends on the particular order in which the access takes place, is called?**

- a) dynamic condition
- b) race condition
- c) essential condition
- d) critical condition

**57. If a process is executing in its critical section, then no other processes can be executing in their critical section. This condition is called?**

- a) mutual exclusion
- b) critical exclusion
- c) synchronous exclusion
- d) asynchronous exclusion

**58. Which one of the following is a synchronization tool?**

- a) thread
- b) pipe
- c) semaphore
- d) socket

**59. A semaphore is a shared integer variable \_\_\_\_\_**

- a) that can not drop below zero
- b) that can not be more than zero
- c) that can not drop below one
- d) that can not be more than one

**60. When high priority task is indirectly preempted by medium priority task effectively inverting the relative priority of the two tasks, the scenario is called \_\_\_\_\_**

- a) priority inversion
- b) priority removal
- c) priority exchange
- d) priority modification

**61. Process synchronization can be done on \_\_\_\_\_**

- a) hardware level
- b) software level
- c) both hardware and software level
- d) none of the mentioned

62. Restricting the child process to a subset of the parent's resources prevents any process from \_\_\_\_\_

- a) overloading the system by using a lot of secondary storage
- b) under-loading the system by very less CPU utilization
- c) overloading the system by creating a lot of sub-processes
- d) crashing the system by utilizing multiple resources

63. In UNIX, each process is identified by its \_\_\_\_\_

- a) Process Control Block
- b) Device Queue
- c) Process Identifier
- d) None of the mentioned

64. The child process can \_\_\_\_\_

- a) be a duplicate of the parent process
- b) never be a duplicate of the parent process
- c) cannot have another program loaded into it
- d) never have another program loaded into it

65. The child process completes execution, but the parent keeps executing, then the child process is known as \_\_\_\_\_

- a) Orphan
- b) Zombie
- c) Body
- d) Dead

66. Which of the following two operations are provided by the IPC facility?

- a) write & delete message
- b) delete & receive message
- c) send & delete message
- d) receive & send message

67. Messages sent by a process \_\_\_\_\_

- a) have to be of a fixed size
- b) have to be a variable size
- c) can be fixed or variable sized
- d) None of the mentioned

68. The Zero Capacity queue \_\_\_\_\_

- a) is referred to as a message system with buffering
- b) is referred to as a message system with no buffering
- c) is referred to as a link
- d) none of the mentioned

69. Bounded capacity and Unbounded capacity queues are referred to as \_\_\_\_\_

- a) Programmed buffering
- b) Automatic buffering
- c) User defined buffering
- d) No buffering

70. Concurrent access to shared data may result in \_\_\_\_\_

- a) data consistency
- b) data insecurity
- c) data inconsistency
- d) none of the mentioned

71. A situation where several processes access and manipulate the same data concurrently and the outcome of the execution depends on the particular order in which access takes place is called \_\_\_\_\_

- a) data consistency
- b) race condition
- c) aging
- d) starvation

72. The segment of code in which the process may change common variables, update tables, write into files is known as \_\_\_\_\_

- a) program
- b) critical section
- c) non - critical section
- d) synchronizing

73. Which of the following conditions must be satisfied to solve the critical section problem?

- a) Mutual Exclusion
- b) Progress
- c) Bounded Waiting
- d) All of the mentioned

74. Mutual exclusion implies that \_\_\_\_\_

- a) if a process is executing in its critical section, then no other process must be executing in their critical sections
- b) if a process is executing in its critical section, then other processes must be executing in their critical sections
- c) if a process is executing in its critical section, then all the resources of the system must be blocked until it finishes execution
- d) none of the mentioned

75. Semaphore is a/an \_\_\_\_\_ to solve the critical section problem.

- a) hardware for a system
- b) special program for a system
- c) integer variable
- d) none of the mentioned

76. What are Spinlocks?

- a) CPU cycles wasting locks over critical sections of programs
- b) Locks that avoid time wastage in context switches
- c) Locks that work better on multiprocessor systems
- d) All of the mentioned

77. What is the main disadvantage of spinlocks?
- a) they are not sufficient for many process
  - b) **they require busy waiting**
  - c) they are unreliable sometimes
  - d) they are too complex for programmers
78. The wait operation of the semaphore basically works on the basic \_\_\_\_\_ system call.
- a) stop()
  - b) **block()**
  - c) hold()
  - d) wait()
79. The signal operation of the semaphore basically works on the basic \_\_\_\_\_ system call.
- a) continue()
  - b) **wakeup()**
  - c) getup()
  - d) start()
80. A binary semaphore is a semaphore with integer values \_\_\_\_\_
- a) **1**
  - b) -1
  - c) 0.8
  - d) 0.5
81. Semaphores are mostly used to implement \_\_\_\_\_
- a) System calls
  - b) **IPC mechanisms**
  - c) System protection
  - d) None of the mentioned
82. Spinlocks are intended to provide \_\_\_\_\_ only.
- a) Mutual Exclusion
  - b) **Bounded Waiting**
  - c) Aging
  - d) Progress
83. The bounded buffer problem is also known as \_\_\_\_\_
- a) Readers – Writers problem
  - b) Dining – Philosophers problem
  - c) **Producer – Consumer problem**
  - d) None of the mentioned
84. In the bounded buffer problem \_\_\_\_\_
- a) there is only one buffer
  - b) **there are n buffers ( n being greater than one but finite)**
  - c) there are infinite buffers
  - d) the buffer size is bounded
85. A deadlock free solution to the dining philosopher's problem \_\_\_\_\_
- a) necessarily eliminates the possibility of starvation
  - b) **does not necessarily eliminate the possibility of starvation**
  - c) eliminates any possibility of any kind of problem further
  - d) none of the mentioned
86. Which of the following condition is required for a deadlock to be possible?
- a) mutual exclusion
  - b) a process may hold allocated resources while awaiting assignment of other resources
  - c) no resource can be forcibly removed from a process holding it
  - d) **all of the mentioned**
87. A system is in the safe state if \_\_\_\_\_
- a) **the system can allocate resources to each process in some order and still avoid a deadlock**
  - b) there exist a safe sequence
  - c) all of the mentioned
  - d) none of the mentioned
88. The circular wait condition can be prevented by \_\_\_\_\_
- a) defining a linear ordering of resource types
  - b) using thread
  - c) using pipes
  - d) all of the mentioned
89. Which one of the following is the deadlock avoidance algorithm?
- a) **banker's algorithm**
  - b) round-robin algorithm
  - c) elevator algorithm
  - d) karn's algorithm
90. What is the drawback of banker's algorithm?
- a) in advance processes rarely know how much resource they will need
  - b) the number of processes changes as time progresses
  - c) resource once available can disappear
  - d) **all of the mentioned**
91. A problem encountered in multitasking when a process is perpetually denied necessary resources is called \_\_\_\_\_
- a) deadlock
  - b) **starvation**
  - c) inversion
  - d) aging

92. The number of resources requested by a process \_\_\_\_\_

- a) must always be less than the total number of resources available in the system
- b) must always be equal to the total number of resources available in the system
- c) must not exceed the total number of resources available in the system
- d) must exceed the total number of resources available in the system

93. For a deadlock to arise, which of the following conditions must hold simultaneously?

- a) Mutual exclusion
- b) No preemption
- c) Hold and wait
- d) All of the mentioned

94. A system is in a safe state only if there exists a \_\_\_\_\_

- a) safe allocation
- b) safe resource
- c) safe sequence
- d) all of the mentioned

95. If no cycle exists in the resource allocation graph \_\_\_\_\_

- a) then the system will not be in a safe state
- b) then the system will be in a safe state
- c) all of the mentioned
- d) none of the mentioned

96. The Banker's algorithm is \_\_\_\_\_ than the resource allocation graph algorithm.

- a) less efficient
- b) more efficient
- c) equal
- d) none of the mentioned

97. The wait-for graph is a deadlock detection algorithm that is applicable when \_\_\_\_\_

- a) all resources have a single instance
- b) all resources have multiple instances
- c) all resources have a single or multiple instances
- d) all of the mentioned

98. If we preempt a resource from a process, the process cannot continue with its normal execution and it must be \_\_\_\_\_

- a) aborted
- b) rolled back
- c) terminated
- d) queued

99. What is the solution to starvation?

- a) the number of rollbacks must be included in the cost factor
- b) the number of resources must be included in resource preemption
- c) resource preemption be done instead
- d) all of the mentioned

100. The major part of swap time is \_\_\_\_\_ time.

- a) waiting
- b) transfer
- c) execution
- d) none of the mentioned

101. Swap space is allocated \_\_\_\_\_

- a) as a chunk of disk
- b) separate from a file system
- c) into a file system
- d) all of the mentioned

102. Run time mapping from virtual to physical address

is done by \_\_\_\_\_

- a) Memory management unit
- b) CPU
- c) PCI
- d) None of the mentioned

103. Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called?

- a) fragmentation
- b) paging
- c) mapping
- d) none of the mentioned

104. What is compaction?

- a) a technique for overcoming internal fragmentation
- b) a paging technique
- c) a technique for overcoming external fragmentation
- d) a technique for overcoming fatal error

105. Transient operating system code is code that \_\_\_\_\_

- a) is not easily accessible
- b) comes and goes as needed
- c) stays in the memory always
- d) never enters the memory space

106. With paging there is no \_\_\_\_\_ fragmentation.

- a) internal
- b) external
- c) either type of
- d) none of the mentioned

107. A process is thrashing if \_\_\_\_\_

- a) it is spending more time paging than executing
- b) it is spending less time paging than executing
- c) page fault occurs
- d) swapping can not take place

108. Virtual memory allows \_\_\_\_\_

- a) execution of a process that may not be completely in memory
- b) a program to be smaller than the physical memory
- c) a program to be larger than the secondary storage
- d) execution of a process without being in physical memory

109. Virtual memory is normally implemented by \_\_\_\_\_

- a) demand paging
- b) buses
- c) virtualization
- d) all of the mentioned

110. Segment replacement algorithms are more complex than page replacement algorithms because \_\_\_\_\_

- a) Segments are better than pages
- b) Pages are better than segments
- c) Segments have variable sizes
- d) Segments have fixed sizes

111. A page fault occurs when?

- a) a page gives inconsistent data
- b) a page cannot be accessed due to its absence from memory
- c) a page is invisible
- d) all of the mentioned

112. When a page fault occurs, the state of the interrupted process is \_\_\_\_\_

- a) disrupted
- b) invalid
- c) saved
- d) none of the mentioned

113. Increasing the RAM of a computer typically improves performance because \_\_\_\_\_

- a) Virtual memory increases
- b) Larger RAMs are faster
- c) Fewer page faults occur
- d) None of the mentioned

114. An unrecoverable error is known as \_\_\_\_\_

- a) hard error
- b) tough error
- c) soft error
- d) none of the mentioned

115. When device A has a cable that plugs into device B, and device B has a cable that plugs into device C and device C plugs into a port on the computer, this arrangement is called a \_\_\_\_\_

- a) port
- b) daisy chain
- c) bus
- d) cable

116. The \_\_\_\_\_ keeps state information about the use of I/O components.

- a) CPU
- b) OS
- c) kernel
- d) shell

117. Which one of the following linux file system does not support journaling feature?

- a) ext2
- b) ext3
- c) ext4
- d) none of the mentioned

118. The first process launched by the linux kernel is \_\_\_\_\_

- a) init process
- b) zombie process
- c) batch process
- d) boot process

119. A process having multiple threads of control implies \_\_\_\_\_

- a) it can do more than one task at a time
- b) it can do only one task at a time, but much faster
- c) it has to use only one thread per process
- d) none of the mentioned

120. When one thread immediately terminates the target thread, it is called \_\_\_\_\_

- a) Asynchronous cancellation
- b) Systematic cancellation
- c) Sudden Termination
- d) Deferred cancellation

## **Database management System (DBMS)**

- 1. In the relational model, cardinality is termed as:**
  - a) Number of tuples.
  - b) Number of attributes.
  - c) Number of tables.
  - d) Number of constraints.
- 2. All kinds of facts, figures and details related people places, things or an event is known as.....**
  - a) Data
  - b) Information
  - c) (a) and (b) both
  - d) None of them
- 3. ..... is nothing but “The Processed Data”.**
  - a) Data
  - b) Information
  - c) both
  - d) none of them
- 4. Users expect ..... in accessing data irrespective of the places they are at and irrespective of where the data is stored.**
  - a) touchability
  - b) flexibility
  - c) eligibility
  - d) none of them
- 5. In current scenario with the advent and reach of digital technologies, almost all data is stored and managed.....**
  - a) electronically
  - b) magnetically
  - c) diagonally
  - d) none of them
- 6. Relational calculus is a**
  - a) Procedural language.
  - b) Non- Procedural language.
  - c) Data definition language.
  - d) High level language.
- 7. The view of total database content is**
  - a) Conceptual view.
  - b) Internal view.
  - c) External view.
  - d) Physical View.
- 8. Cartesian product in relational algebra is**
  - a) Unary operator.
  - b) Binary operator.
  - c) Ternary operator.
  - d) not defined.
- 9. DML is provided for**
  - a) Description of logical structure of database.
  - b) Addition of new structures in the database system.
  - c) Manipulation & processing of database.
  - d) Definition of physical structure of database system.
- 10. In a relational model, relations are termed as**
  - a) Tuples
  - b) Attributes
  - c) Tables.
  - d) Rows.
- 11. The database schema is written in**
  - a) HLL
  - b) DML
  - c) DDL
  - d) DCL
- 12. In the architecture of a database system external level is the**
  - a) physical level.
  - b) logical level.
  - c) conceptual level
  - d) view level.
- 13. An entity set that does not have sufficient attributes to form a primary key is a**
  - a) strong entity set.
  - b) weak entity set.
  - c) simple entity set.
  - d) primary entity set.
- 14. In a Hierarchical model, records are organized as**
  - a) Graph.
  - b) List.
  - c) Links.
  - d) Tree.
- 15. In an E-R diagram attributes are represented by**
  - a) rectangle.
  - b) square.
  - c) ellipse.
  - d) triangle.

- 16. The language used in application programs to request data from the DBMS is referred to as the**
- a) DML
  - b) DDL
  - c) VDL
  - d) SDL
- 17. A logical schema**
- a) is the entire database.
  - b) is a standard way of organizing information into accessible parts.
  - c) describes how data is actually stored on disk.
  - d) both (A) and (C)
- 18. In an E-R diagram an entity set is represented by a**
- a) rectangle.
  - b) ellipse.
  - c) diamond box.
  - d) circle.
- 19. The DBMS language component which can be embedded in a program is**
- a) The data definition language (DDL).
  - b) The data manipulation language (DML).
  - c) The database administrator (DBA).
  - d) A query language.
- 20. A relational database developer refers to a record as**
- a) a criterion
  - b) a relation.
  - c) a tuple.
  - d) an attribute.
- 21. The method in which records are physically stored in a specified order according to a key field in each record is**
- a) hash.
  - b) direct.
  - c) sequential
  - d) all of the above.
- 22. A subschema expresses**
- a) the logical view.
  - b) the physical view.
  - c) the external view.
  - d) all of the above.
- 23. An advantage of the database management approach is**
- a) data is dependent on programs.
  - b) data redundancy increases.
  - c) data is integrated and can be accessed by multiple programs.
  - d) none of the above.
- 24. Transaction processing is associated with everything below except**
- a) producing detail, summary, or exception reports.
  - b) recording a business activity.
  - c) confirming an action or triggering a response.
  - d) maintaining data.
- 25. The method of access which uses key transformation is known as**
- a) direct.
  - b) hash.
  - c) random.
  - d) sequential.
- 26. The statement in SQL which allows to change the definition of a table is**
- a) Alter.
  - b) Update.
  - c) Create.
  - d) select.
- 27. E-R model uses this symbol to represent weak entity set?**
- a) Dotted rectangle.
  - b) Diamond
  - c) Doubly outlined rectangle
  - d) None of these
- 28. Relational Algebra is**
- a) Data Definition Language
  - b) Meta Language
  - c) Procedural query Language
  - d) None of the above
- 29. Key to represent relationship between tables is called**
- a) Primary key
  - b) Secondary Key
  - c) Foreign Key
  - d) None of these

30. The file organization that provides very fast access to any arbitrary record of a file is
- a) Ordered file
  - b) Unordered file
  - c) Hashed file
  - d) B-tree
31. Which of the following are the properties of entities?
- a) Groups
  - b) Table
  - c) Attributes
  - d) Switchboards
32. It is better to use files than a DBMS when there are
- a) Stringent real-time requirements.
  - b) Multiple users wish to access the data.
  - c) Complex relationships among data.
  - d) All of the above.
33. Which of the following operation is used if we are interested in only certain columns of a table?
- a) PROJECTION
  - b) SELECTION
  - c) UNION
  - d) JOIN
34. .....data type can store unstructured data
- a) RAW
  - b) CHAR
  - c) NUMERIC
  - d) VARCHAR
35. The method of access which uses key transformation is known as
- a) Direct
  - b) Hash
  - c) Random
  - d) Sequential
36. ..... is a virtual table that draws its data from the result of an SQL SELECT statement.
- a) View
  - b) Synonym
  - c) Sequence
  - d) Transaction
37. In E-R diagram generalization is represented by
- a) Ellipse
  - b) Dashed ellipse
  - c) Rectangle
  - d) Triangle
38. A data manipulation command that combines the records from one or more tables is called.....
- a) SELECT
  - b) PROJECT
  - c) JOIN
  - d) PRODUCT
39. In E-R Diagram relationship type is represented by
- a) Ellipse
  - b) Dashed ellipse
  - c) Rectangle
  - d) Diamond
40. A primary key if combined with a foreign key creates.....
- a) Parent-Child relationship between the tables that connect them.
  - b) Many to many relationships between the tables that connect them.
  - c) Network model between the tables that connect them.
  - d) None of the above.
41. The natural join is equal to.....
- a) Cartesian Product
  - b) Combination of Union and Cartesian product
  - c) Combination of selection and Cartesian product
  - d) Combination of projection and Cartesian product
42. Consider the join of a relation R with relation S. If R has m tuples and S has n tuples, then the maximum size of join is:
- a) mn
  - b) m+n
  - c) (m+n)/2
  - d) 2(m+n)
43. Cross Product is a:
- a) Unary Operator
  - b) Ternary Operator
  - c) Binary Operator
  - d) Not an operator

**44. In E-R Diagram derived attribute are represented by**

- a) Ellipse
- b) Dashed ellipse
- c) Rectangle
- d) Triangle

**45. A data dictionary is a special file that contains:**

- a) The name of all fields in all files.
- b) The width of all fields in all files.
- c) The data type of all fields in all files.
- d) All of the above.

**46. Which of the following is a comparison operator in SQL?**

- a) =
- b) LIKE
- c) BETWEEN
- d) All of the above

**47. The underlying structure of database is known as.....**

- a) Data model
- b) Data arrangement
- c) Data manipulation
- d) Encapsulation

**48. Which of the following describes way of storing and retrieving the data?**

- a) Data model
- b) Data arrangement
- c) Data manipulation
- d) Encapsulation

**49. Database Management System can perform**

- a) Retrieval of data as per user requirement
- b) Securing data and Maintaining backup of database
- c) Allowing multiple users to access database simultaneously
- d) All of them

**50. .... are real world objects about which information is to be stored in database.**

- a) Entities
- b) Objects
- c) Data
- d) Attributes

**51. Each entity generally has collection of ..... associated to it.**

- a) attributes
- b) database
- c) table
- d) none of them

**52. Which data type stores up to the specified length and no padding is done?**

- a) Var Char
- b) Char
- c) Var Char Ignore case
- d) None of them

**53. \_\_\_\_\_ code that needs only one byte to store a character.**

- a) ASCII
- b) ANSI
- c) DBMS
- d) RDBMS

**54. A \_\_\_\_\_ value means unknown or missing value.**

- a) junk
- b) null
- c) litter
- d) refuse

**55. Primary key values cannot contain \_\_\_\_\_**

- a) Duplicate values
- b) Null values
- c) (a) and (b)
- d) None of them

**56. A primary key designed by combining more than one field is known as \_\_\_\_\_ primary key.**

- a) Composite
- b) Secondary
- c) Tertiary
- d) Main

**57. Base will automatically assign ..... extension to the database file.**

- a) .obd
- b) .odb
- c) .bas
- d) .bdo

**58. ER model is used in \_\_\_\_\_**

- a) conceptual database
- b) schema refinement
- c) physical refinement
- d) applications and security

**59. Which of the following statements is not correct?**

- a) an entity is an object to the real world
- b) entity is described using attributes
- c) attributes are described using entity
- d) each attribute must identify a domain

**60. An instance is \_\_\_\_\_**

- a) a set of relationships
- b) set of attributes
- c) set of entities
- d) schema

- 61. The language used application programs to request data from the DBMS is referred to as the**
- a) DML
  - b) DDL
  - c) query language
  - d) none
- 62. The relational database environment has all of the following components except**
- a) users
  - b) separate files
  - c) database
  - d) query languages
- 63. \_\_\_\_\_ is a ‘thing’ in the real world with an independent existence.**
- a) Entity
  - b) Attribute
  - c) Key
  - d) Relationship
- 64. Which view is normally more stable?**
- a) internal level
  - b) external level
  - c) conceptual level
  - d) view level
- 65. The ability to modify the conceptual schema without causing any change to the application program**
- a) Physical data independence
  - b) Logical Data independence
  - c) External Data independence
  - d) none
- 66. The information about data in a database is called**
- a) Meta data
  - b) Tera data
  - c) hyper data
  - d) none
- 67. The links between rows of a master table and those of a nested table are maintained using:**
- a) pointers.
  - b) foreign keys.
  - c) determinants
  - d) clusters.
- 68. A tuple is also known as a(n)**
- a) table
  - b) relation
  - c) row
  - d) field
- 69. An attribute is also known as a(n)**
- a) table
  - b) relation
  - c) row
  - d) field
- 70. This Relational Algebra operation requires two tables as input and the two tables must have one common**
- a) RESTRICTION
  - b) JOIN
  - c) DIVISION
  - d) PROJECTION
- 71. Which SQL keyword must be used to remove duplicate rows from the result relation?**
- a) DELETE
  - b) DISTINCT
  - c) NOT EXISTS
  - d) UNIQUE
- 72. Which SQL keyword is used to return only different values?**
- a) COUNT
  - b) NOSAME
  - c) GROUP
  - d) DISTINCT
- 73. Which SQL keyword is used to sort the result?**
- a) ORDER
  - b) SORT-ORDER
  - c) SORT
  - d) ORDER BY
- 74. A table that is in 2NF and contains no transitive dependencies is said to be in**
- a) 1NF.
  - b) 2NF.
  - c) 3NF.
  - d) 4NF.
- 75. An entity is in second normal form if:**
- a) all the values of nonprimary keys are dependent on the full primary key.
  - b) any non-key attributes that are dependent on only part of the primary key should be moved to any entity where that partial key is the actual full key.
  - c) it must already be in first normal form.
  - d) all of the above.
- 76. A functional dependency is a relationship between or among:**
- a) Tables
  - b) Relations
  - c) Rows
  - d) Attributes
- 77. A table with a \_\_\_\_\_ cannot exhibit partial dependencies.**
- a) two rows
  - b) single-attribute
  - c) three columns
  - d) none of the above

78. Denormalization produces a \_\_\_\_\_ normal form.
- a) higher
  - b) upper
  - c) slower
  - d) lower
79. Higher normal forms are better than lower normal forms because higher normal forms yield fewer \_\_\_\_\_ in the database.
- a) update, delete
  - b) data storage
  - c) data redundancies
  - d) none of the above
80. The 2NF describes the tabular format in which:
- a) there are no repeating groups in the table
  - b) all attributes are dependent on the primary key
  - c) A & B with no partial dependency
  - d) there is no partial dependency
81. The process of converting complex object data structures into well-structured relations is called:
- a) object-relational modeling.
  - b) normalization.
  - c) referential integrity.
  - d) determinant analysis.
82. A relation is considered to be in second normal form if it is in first normal form and it has no \_\_\_\_\_ dependencies.
- a) referential
  - b) functional
  - c) partial key
  - d) transitive
83. An attribute in one table that references a unique record in another table is called a:
- a) determinant.
  - b) foreign key.
  - c) referential attribute.
  - d) functional dependency.
84. The essential characteristic of \_\_\_\_\_ normal form is that every determinant in the table must be a candidate key.
- a) Boyce Codd
  - b) Domain Key
  - c) Fourth
  - d) Fifth
85. Software that defines a database, stores the data, supports a query language, produces reports and creates data entry screens is
- a) data dictionary
  - b) database management system (DBMS)
  - c) decision support system
  - d) relational database
86. The modern database report writer:
- a) is a career path that focuses on creating, managing and supporting the reports generated from databases
  - b) provide limited control over how information is displayed and reported.
  - c) provides the tools for database designer to display information in the desired format
  - d) provides the tools for the database administrator to monitor and report on database use and activity
87. The separation of the data definition from the program is known as.....
- a) data dictionary
  - b) data independence
  - c) data integrity
  - d) referential integrity
88. In the client / server model, the database:
- a) is downloaded to the client upon request
  - b) is shared by both the client and server
  - c) resides on the client side
  - d) resides on the server side
89. The traditional storage of data that is organized by customer, stored in separate folders in filing cabinets is an example of what type of 'database' system?
- a) Hierarchical
  - b) Network
  - c) Object oriented
  - d) Relational
90. The database design that consists of multiple tables that are linked together through matching data stored in each table is called
- a) Hierarchical database
  - b) Network database
  - c) Object oriented database
  - d) Relational database
91. What is the main limitation of Hierarchical Databases?
- a) Limited capacity (unable to hold much data)
  - b) Limited flexibility in accessing data
  - c) Overhead associated with maintaining indexes
  - d) The performance of the database is poor
92. An abstract data type is used to:
- a) link data from remote databases.
  - b) prevent users from getting to database security information.
  - c) provide a conceptual view of the data so it is easier to understand.
  - d) store complex data structure to represent the properties of objects

93. One of the first phases of a new database project that involves critical areas, expensive hardware or software within the organization is called \_\_\_\_\_

- a) analysis phase
- b) **feasibility study**
- c) investigation stage
- d) system design

94. Which component of the database management system (DBMS) most affects the ability to handle large problems (scalability)?

- a) Data Storage Subsystem
- b) **Database Engine**
- c) Query Processor
- d) Security Subsystem

95. The primary difference between the Relational database (RDB) and Object oriented database (OODB) models is:

- a) OODB incorporates methods in with the definition of the data structure, while RDB does not
- b) OODB supports multiple objects in the same database while RDB only supports a single table per database
- c) RDB allows the definition of the relationships between the different tables, while OODB does not allow the relationships to be defined between objects
- d) RDB supports indexes, while OODB does not support indexes

96. Which of the following items is not the advantage of a DBMS?

- a) Improved ability to enforce standards
- b) Improved data consistency
- c) **Local control over the data**
- d) Minimal data redundancy

97. The predominant way of storing data today is using which type of database models?

- a) Hierarchical
- b) Network
- c) Object oriented
- d) **Relational**

98. Two different terms are used to describe the characteristics of interest for an entity. They are attributes and:

- a) classes
- b) entities
- c) **properties**
- d) traits

99. When building a database, the data dealing with an entity is modeled as a:

- a) attribute
- b) **class**
- c) object
- d) table

100. The property (or set of properties) that uniquely defines each row in a table is called the:

- a) identifier
- b) index
- c) **primary key**
- d) symmetric key

101. Business rules can be represented in the database through:

- a) **associations (or relationships)**
- b) attributes
- c) properties
- d) secondary keys

102. The association role defines.....

- a) **how tables are related in the database**
- b) the relationship between the class diagram and the tables in the database
- c) the tables that each attribute is contained
- d) which attribute is the table's primary key

103. The purpose of an N-Ary association is:

- a) to capture a parent-child relationship
- b) to deal with one to many relationships
- c) **to deal with relationships that involve more than two tables**
- d) to represent an inheritance relationship

104. A composition association is drawn using which symbol:

- a) A line which loops back onto the same table
- b) **Small closed diamond at the end of a line connecting two tables**
- c) Small open diamond at the end of a line connecting two tables
- d) Small triangle at the end of a line connecting the aggregated item and multiple component items

105. Assume you are creating a database to handle the data associated with instruction at a university. What is the most appropriate special association to model that a class may have multiple pre-requisites?

- a) aggregation association
- b) generalization association
- c) n-ary association
- d) **reflexive association**

106. Assume you are creating a database to handle the data associated with instruction at a university. What is the most appropriate special association to model degree requirements (i.e., required number of courses in humanity, science, math, etc.)?

- a) **composition association**
- b) generalization association
- c) n-ary association
- d) reflexive association

**107. Assume you are creating a database to handle the data associated with instruction at a university. What is the most appropriate special association to model that a course has an assigned instructor, Teaching Assistants, a classroom, meeting time slot, and class roster?**

- a) aggregation association
- b) generalization association
- c) **n-ary association**
- d) reflexive association

**108. What is the most appropriate special association that indicates that multiple textbooks make up a course required reading list?**

- a) aggregation association
- b) generalization association
- c) **n-ary association**
- d) reflexive association

**109. What is the special association that indicates that one object can be broken down into multiple special cases?**

- a) composition association
- b) **generalization association**
- c) n-ary association
- d) reflexive association

**110. The number of indexes allowed per table in MySQL**

are \_\_\_\_\_.

- a) 64
- b) 50
- c) 10
- d) 100

**111. A reflexive association is one where one class is:**

- a) broken down into special cases
- b) combined with multiple other classes
- c) combined with one other class
- d) **linked back to itself**

**112. Which of the following statements is not correct?**

- a) A primary goal of a database system is to share data with multiple users
- b) It is possible to change a method or property inherited from a higher-level class
- c) **While companies collect data all the time, the structure of the data changes very often.**
- d) In a client / server environment, data independence causes client-side applications to be essentially independent of the database stored on the server side.

**113. Which of the following statements is not correct?**

- a) **Data Normalization is the process of defining the table structure**
- b) The purpose of class diagrams is to model the interrelationships between the different classes in the database
- c) Individual objects are stored as rows in a table
- d) Properties of an object are stored as columns in a table.

**114. The Bankers algorithm is used to ..... ?**

- a) **prevent deadlock**
- b) avoid deadlock
- c) ignore deadlock
- d) detecting deadlock

**115. A page fault occurs when ..... ?**

- a) **the page is not found in the memory**
- b) page size if full
- c) page is altered
- d) none

## Microprocessor and Microcontroller

1. 8085 microprocessors have .....  
a) 30 pin  
b) 39 pin  
c) **40 pin**  
d) 41 pin
2. Which one of the following is not a vectored interrupt?  
a) TRAP  
b) INTR  
c) RST 7.5  
d) **RST 3**
3. In 8085 microprocessors, the RST6 instruction transfer program execution to following location  
a) **0030H**  
b) 0024H  
c) 0048H  
d) 0060H
4. HLT opcode means  
a) Load data to accumulator  
b) Store result in memory  
c) Load accumulator with contents of register  
d) **End of Program**
5. Which of the following is not an addressing mode of 8051?  
a) register instructions  
b) register specific instructions  
c) indexed addressing  
d) **None**
6. The coprocessor and the processor is connected via?  
a) **TEST**  
b) QS0  
c) QS1  
d) All of the above
7. In 8085 names of the 16 bit registers are  
a) Stack pointer  
b) Program counter  
c) **Both A and B**  
d) None of these
8. In which of these addressing modes, a constant is specified in the instruction, after the opcode byte?  
a) register instructions  
b) Register specific instructions  
c) Direct addressing  
d) **immediate mode**
9. It is a power supply signal, which requires +5V supply for the operation of the circuit.  
a) VCA  
b) VDD  
c) **VCC**  
d) INTA.
10. The \_\_\_\_\_ handles all the communication between the processor and the memory  
a) numeric extension unit  
b) Packed Unit  
c) **control unit**  
d) Binary Unit
11. The instruction, ADD A, R7 is an example of  
a) register instructions  
b) **Register specific instructions**  
c) Indexed addressing  
d) none
12. What is SIM?  
a) Select interrupt  
b) Sorting interrupt mask  
c) **Set interrupt mask**  
d) None of these
13. The only memory which can be accessed using indexed addressing mode is  
a) RAM  
b) ROM  
c) Main memory  
d) **Program memory**

14. The number of output pins in 8085 microprocessors are
- 27
  - 40
  - 21
  - 19
15. An interrupt breaks the execution of instructions and diverts its execution to
- Interrupt service routine
  - Counter word register
  - Execution unit
  - control unit
16. The data address of look-up table is found by adding the contents of
- accumulator with that of program counter
  - accumulator with that of program counter or data pointer
  - data register with that of program counter or accumulator
  - data register with that of program counter or data pointer
17. The program counter in a 8085 microprocessor is a 16-bit register, because
- It counts 16 bit at a time
  - There are 16 address lines
  - It facilitates the user storing 16 bit data temporarily
  - It has to fetch two 8 bit data at a time
18. While executing the main program, if two or more interrupts occur, then the sequence of appearance of interrupts is called
- multi-interrupt
  - nested interrupt
  - interrupt within interrupt
  - nested interrupt and interrupt within interrupt
19. A microcontroller at-least should consist of:
- RAM, ROM, I/O ports and timers
  - CPU, RAM, I/O ports and timers
  - CPU, RAM, ROM, I/O ports and timers
  - CPU, ROM, I/O ports and timers
20. How many bytes of bit addressable memory is present in 8051 based microcontrollers?
- 8 bytes
  - 32 bytes
  - 16 bytes
  - 128 bytes
21. Output of the assembler in machine codes is referred to as
- Object program
  - Source program
  - Macro instruction
  - Symbolic addressing
22. Unlike microprocessors, microcontrollers make use of batteries because they have:
- high power dissipation
  - low power consumption
  - low voltage consumption
  - low current consumption
23. Why microcontrollers are not called general purpose computers?
- because they have built in RAM and ROM
  - because they design to perform dedicated task
  - because they are cheap
  - because they consume low power
24. Which of the following statements for intel 8085 is correct?
- Program counter(PC) specifies the address of the instruction last executed
  - PC specifies the address of the instruction being executed
  - PC specifies the address of the instruction to be executed
  - PC specifies the number of instructions executed so far
25. If any interrupt request given to an input pin cannot be disabled by any means then the input pin is called
- maskable interrupt
  - nonmaskable interrupt
  - maskable interrupt and nonmaskable interrupt
  - none of the mentioned

26. Register that is used to holds the memory address of the next instruction to be executed is
- Program Memory
  - Program Counter**
  - Control Unit
  - Instruction decoder
27. Which one of the following is not correct?
- Bus is a group of wires
  - Bootstrap is a technique or device for loading first instruction
  - An instruction is a set of bits that defines a computer operation
  - An interrupt signal is required at the start of every program**
28. The cycle required to fetch and execute an instruction in a 8085 microprocessor is which one of the following?
- Clock cycle
  - Memory cycle
  - Machine cycle
  - Instruction cycle**
29. What do you mean by micro in microcontroller?
- Distance between 2 IC's
  - Distance between 2 transistors**
  - Size of a controller
  - Distance between 2 pins
30. The INTR interrupt may be
- maskable**
  - nonmaskable
  - maskable and nonmaskable
  - none of the mentioned
31. What is the bit size of the 8051 microcontrollers?
- 8-bit**
  - 4-bit
  - 16-bit
  - 32-bit
32. Number of I/O ports in the 8051 microcontrollers?
- 3 ports
  - 4 ports**
  - 5 ports
  - 4 ports with last port having 5 pins
33. Whenever a number of devices interrupt a CPU at a time, and if the processor is able to handle them properly, it is said to have
- interrupt handling ability
  - interrupt processing ability
  - multiple interrupt processing ability**
  - multiple interrupt executing ability
34. Program counter stores what?
- Address of before instruction
  - Address of the next instruction**
  - Data of the before execution to be executed
  - Data of the execution instruction
35. Which is the microprocessor comprising?
- Register section
  - One or more ALU
  - Control unit
  - All of these**
36. The Programmable interrupt controller is required to
- handle one interrupt request**
  - handle one or more interrupt requests at a time
  - handle one or more interrupt requests with a delay
  - handle no interrupt request
37. Which pin provides a reset option in 8051?
- Pin 1
  - Pin 8
  - Pin 11
  - Pin 9**
38. Accumulator based microprocessor example are:
- Intel 8085
  - Motorola 6809
  - Both**
  - None of these
39. The INTR interrupt may be masked using the flag
- direction flag
  - overflow flag
  - interrupt flag**
  - sign flag

40. Which is used to store critical pieces of data during subroutines and interrupts:
- Stack
  - Queue
  - Accumulator
  - Data register
41. External Access is used to permit \_\_\_\_\_
- Peripherals
  - Power supply
  - ALE
  - Memory interfacing
42. Which is not the control bus signal:
- READ
  - WRITE
  - RESET
  - None of these
43. In 8085 microprocessors how many interrupts are maskable?
- Two
  - Three
  - Four
  - Five
44. Which one of the following addressing technique is not used in 8085 microprocessor?
- Register
  - Immediate
  - Register indirect
  - Relative
45. The RAM which is created using bipolar transistors is called:
- Dynamic RAM
  - Static RAM
  - Permanent RAM
  - DDR RAM
46. The device that receives or transmits data upon the execution of input or output instructions by the microprocessor is
- control word register
  - read/write control logic
  - 3-state bidirectional buffer
  - none of the mentioned
47. Which one of the following register of 8085 microprocessor is not a part of the programming model?
- Instruction register
  - Memory address register
  - Status register
  - Temporary data register
48. The CPU sends out a \_\_\_\_\_ signal to indicate that valid data is available on the data bus:
- Read
  - Write
  - Both A and B
  - None of these
49. BIU STAND FOR:
- Bus interface unit
  - Bess interface unit
  - A and B
  - None of these
50. The pin that clears the control word register of 8255 when enabled is
- CLEAR
  - SET
  - RESET
  - CLK
51. The program counter in 8085 microprocessor is a 16 bit register because
- It counts 16 bits at a time
  - There are 16 address times
  - It facilitates the users storing 16 bit data temporarily
  - It has to fetch two 8 bit data at a time
52. The four-index register can be used for:
- Arithmetic operation
  - Multipulation operation
  - Subtraction operation
  - None
53. Which signal is used to select the slave in the serial peripheral interfacing?
- slave select
  - master select
  - Interrupt
  - clock signal

54. A direct memory access (DMA) transfer replies
- a) Direct transfer of data between memory and accumulator
  - b) **Direct transfer of data between memory and I/O devices without the use of microprocessor**
  - c) Transfer of data exclusively within microprocessor registers
  - d) A fast transfer of data between microprocessor and I/O devices
55. In 8085 microprocessor system with memory mapped I/O, which of the following is true?
- a) Devices have 8-bit address line
  - b) Devices are accessed using IN and OUT instructions
  - c) There can be maximum of 256 input devices and 256 output devices
  - d) **Arithmetic and logic operations can be directly performed with the I/O data**
56. In intel 8085A microprocessor ALE signal is made high .....
- a) Enable the data bus to be used as low order address bus
  - b) **To latch data D0-D7 from data bus**
  - c) To disable data bus
  - d) To achieve all the functions listed above
57. If the pins of the keyboard are used as an interrupt, then these pins will cause an interrupt of what type?
- a) External hardware interrupt
  - b) **Timer interrupt**
  - c) TI/RI interrupt
  - d) None of the mentioned
58. Handshaking mode of data transfer is
- a) **Synchronous data transfer**
  - b) asynchronous data transfer
  - c) interrupt driven data transfer
  - d) None
59. In a microprocessor the address of the next instruction to be executed is stored in
- a) Stack pointer
  - b) Address latch
  - c) **Program counter**
  - d) General purpose register
60. Which commands are used for addressing the off-chip data and associated codes respectively by data pointer?
- a) **MOVX & MOVC**
  - b) MOVY & MOVB
  - c) MOVZ & MOVA
  - d) MOVC & MOVY
61. The instruction RET executes with the following series of machine cycle
- a) Fetch, read, write
  - b) **Fetch, write, write**
  - c) Fetch, read, read
  - d) Fetch, read
62. Direction flag is used with
- a) **String instructions**
  - b) Stack instructions
  - c) Arithmetic instructions
  - d) Branch instructions
63. Following is a 16 bit register for 8085 microprocessor
- a) Stack pointer
  - b) **Accumulator**
  - c) Register B
  - d) Register C
64. The register inform which holds the information about the nature of results of arithmetic or logic operations is called as
- a) Accumulator
  - b) Condition code register
  - c) **Flag register**
  - d) Process status registers
65. A machine language instructions format consists of
- a) Operation code field.
  - b) **Operation code field & operand field**
  - c) Operand field
  - d) none of the mentioned
66. The instruction MOVAX, 123H is an example of
- a) register addressing mode
  - b) **immediate addressing mode**
  - c) based indexed addressing mode
  - d) direct addressing mode

67. Which operations are performed by the bit manipulating instructions of boolean processor?
- a) Complement bit
  - b) Set bit
  - c) Clear bit
  - d) All of the above
68. Which data memory control and handle the operation of several peripherals by assigning them in the category of special function registers?
- a) Internal on-chip RAM
  - b) External off-chip RAM
  - c) Both a & b
  - d) None of the above
69. Why is the speed accessibility of external data memory slower than internal on-chip RAM?
- a) Due to multiplexing of lower order byte of address-data bus
  - b) Due to multiplexing of higher order byte of address-data bus
  - c) Due to demultiplexing of lower order byte of address-data bus
  - d) Due to demultiplexing of higher order byte of address-data bus
70. Which register usually store the output generated by ALU in several arithmetic and logical operations?
- a) Accumulator
  - b) Special Function Register
  - c) Timer Register
  - d) Stack Pointer
71. Why is CMOS technology preferred over HMOS technology for designing the devices of MCS-51 family?
- a) Due to higher noise immunity
  - b) Due to lower power consumption
  - c) Due to higher speed
  - d) All of the above
72. Which condition approve to prefer the EPROM/ROM versions for mass production in order to prevent the external memory connections?
- a) size of code < size of on-chip program memory
  - b) size of code > size of on-chip program memory
  - c) size of code = size of on-chip program memory
  - d) None of the above
73. Which characteristic/s of accumulator is /are of greater significance in terms of its functionality?
- a) Ability to store one of the operands before the execution of an instruction
  - b) Ability to store the result after the execution of an instruction
  - c) Both a & b
  - d) None of the above
74. What kind of instructions usually affect the program counter?
- a) Call & Jump
  - b) Call & Return
  - c) Push & Pop
  - d) Return & Jump
75. Which flags represent the least significant bit (LSB) and most significant bit (MSB) of Program Status Word (PSW) respectively?
- a) Parity Flag & Carry Flag
  - b) Parity Flag & Auxiliary Carry Flag
  - c) Carry Flag & Overflow Flag
  - d) Carry Flag & Auxiliary Carry Flag
76. Which locations of 128 bytes on-chip additional RAM are generally reserved for special functions?
- a) 80H to 0FFH
  - b) 70H to 0FFH
  - c) 90H to 0FFH
  - d) 60H to 0FFH

77. Which instruction find its utility in loading the data pointer with 16 bits immediate data?
- a) MOV
  - b) INC
  - c) DEC
  - d) ADDC
78. What is the maximum capability of addressing the off-chip data memory & off-chip program memory in a data pointer?
- a) 8K
  - b) 16K
  - c) 32K
  - d) 64K
79. Which among the below mentioned functions does not belong to the category of alternate functions usually performed by Port 3 (Pins 10-17)?
- a) External Interrupts
  - b) Internal Interrupts
  - c) Serial Ports
  - d) Read / Write Control signals
80. Which output control signal is activated after every six oscillator periods while fetching the external program memory and almost remains high during internal program execution?
- a) ALE
  - b) PSEN
  - c) EA
  - d) All of the above
81. Which version of MCS-51 requires the necessary connection of external clock source to XTAL2 in addition to the XTAL1 connectivity to ground level?
- a) HMOS
  - b) CHMOS
  - c) CMOS
  - d) All of the above
82. How does the processor respond to an occurrence of the interrupt?
- a) By Interrupt Service Subroutine
  - b) By Interrupt Status Subroutine
  - c) By Interrupt Structure Subroutine
  - d) By Interrupt System Subroutine
83. Which location specify the storage/loading of vector address during the interrupt generation?
- a) Stack Pointer
  - b) Program Counter
  - c) Data Pointer
  - d) All of the above

## Computer Architecture

1. Control Unit acts as the central nervous system of the computer.

a) True

b) False

2. The address generated by the CPU is referred to as \_\_\_\_\_

a) Physical address

b) Logical address

c) Neither physical nor logical

d) None of the mentioned

3. The address loaded into the memory address register of the memory is referred to as \_\_\_\_\_

a) Physical address

b) Logical address

c) Neither physical nor logical

d) None of the mentioned

4. Which of the following holds the last instruction fetched?

a) PC

b) MAR

c) MBR

d) IR

5. Whenever the data is found in the cache memory it is called as \_\_\_\_\_

a) HIT

b) MISS

c) FOUND

d) ERROR

6. Which of the following is correct about 8086 microprocessor?

a) Intel's first x86 processor

b) Motorola's first x86 processor

c) STMICROELECTRONICS's first x86 processor

d) NanoXplore x86 processor

7. Which of the following is a type of microprocessor?

a) CISC

b) RISC

c) EPIC

d) All of the mentioned

8. The microprocessor of a computer can operate on any information if it is present in \_\_\_\_\_ only.

a) Program Counter

b) Flag

c) Main Memory

d) Secondary Memory

9. Which of the following addressing method does the instruction, MOV AX,[BX] represent?

a) register indirect addressing mode

b) direct addressing mode

c) register addressing mode

d) register relative addressing mode

10. Which of the following is not true about the address bus?

a) It consists of control PIN 21 to 28

b) It is a bidirectional

c) It is 16 bits in length

d) It is Unidirectional

**11. Which of the following is true about microprocessors?**

- a) It has an internal memory
- b) It has interfacing circuits
- c) It contains ALU, CU, and registers**
- d) It uses Harvard architecture

**12. Which of the following is a special-purpose register of microprocessor?**

- a) Program counter**
- b) Instruction register
- c) Accumulator
- d) Temporary register

**13. How many address lines are present in 8086 microprocessor?**

- a) 16
- b) 20**
- c) 32
- d) 40

**14. Which of the following is not a condition flag?**

- a) Trap flag
- b) Auxiliary carry flag
- c) Parity flag
- d) Zero flag

**15. A memory connected to a microprocessor has 20 address lines and 16 data lines. What will be the memory capacity?**

- a) 8 KB
- b) 2 MB**
- c) 16 MB
- d) 64 KB

**16. Which of the following is not true about 8085 microprocessor?**

- a) It is an 8-bit microprocessor
- b) It is a 40 pin DIP chip
- c) It is manufactured using PMOS technology**
- d) It has 16 address lines

**17. What does a loader do in a microprocessor?**

- a) Converts hexadecimal code to binary**
- b) Converts decimal to binary
- c) Increments the content of the program counter by 1
- d) Decodes an opcode

**18. When the data at a location in cache is different from the data located in the main memory, the cache is called \_\_\_\_\_**

- a) Unique
- b) Inconsistent**
- c) Variable
- d) Fault

**19. In \_\_\_\_\_ mapping, the data can be mapped anywhere in the Cache Memory.**

- a) Associative**
- b) Direct
- c) Set Associative
- d) Indirect

**20. The transfer between CPU and Cache is \_\_\_\_\_**

- a) Block transfer
- b) Word transfer**
- c) Set transfer
- d) Associative transfer

**21. The number of clock cycles per second is referred as \_\_\_\_\_**

- a) Clock speed**
- b) Clock frequency
- c) Clock rate
- d) Clock timing

22. Which of the following processor has a fixed length of instructions?

- a) CISC
- b) RISC
- c) EPIC
- d) Multi-core

23. Processor which is complex and expensive to produce is \_\_\_\_\_

- a) RISC
- b) EPIC
- c) CISC
- d) Multi-core

24. Which of the following is the fastest means of memory access for CPU?

- a) Registers
- b) Cache
- c) Main memory
- d) Virtual Memory

25. Size of the \_\_\_\_\_ memory mainly depends on the size of the address bus.

- a) Main
- b) Virtual
- c) Secondary
- d) Cache

26. Which of the following is independent of the address bus?

- a) Secondary memory
- b) Main memory
- c) Onboard memory
- d) Cache memory

27. If M denotes the number of memory locations and N denotes the word size, then an expression that denotes the storage capacity is \_\_\_\_\_

- a)  $M^N$
- b)  $M+N$
- c)  $2M+N$
- d)  $2M-N$

28. The operation that does not involves clock cycles is \_\_\_\_\_

- a) Installation of a device
- b) Execute
- c) Fetch
- d) Decode

29. Word length of a personal computer \_\_\_\_\_

- a) 64bits
- b) 16 bits
- c) 8 bits
- d) 32 bits

30. The process in which a file is partitioned into smaller parts and different parts are stored in different disks is \_\_\_\_\_

- a) RAID
- b) Mirroring
- c) Stripping
- d) RAID classification

31. The base register is also known as the \_\_\_\_\_

- a) basic register
- b) regular register
- c) relocation register
- d) deallocation register

32. CPU fetches the instruction from memory according to the value of \_\_\_\_\_

- a) program counter
- b) status register
- c) instruction register
- d) program status word

33. Program always deals with \_\_\_\_\_

- a) logical address
- b) absolute address
- c) physical address
- d) relative address

34. The ALU makes use of \_\_\_\_\_ to store the intermediate results.

- a) Accumulators
- b) Registers
- c) Heap
- d) Stack

35. \_\_\_\_\_ structure is usually used to connect I/O devices.

- a) Single bus
- b) Multiple bus
- c) Star bus
- d) Rambus

36. \_\_\_\_\_ is generally used to increase the apparent size of physical memory.

- a) Secondary memory
- b) Virtual memory
- c) Hard-disk
- d) Disks

37. ISP stands for \_\_\_\_\_

- a) Instruction Set Processor
- b) Information Standard Processing
- c) Interchange Standard Protocol
- d) Interrupt Service Procedure

38. \_\_\_\_\_ is used to choose between incrementing the PC or performing ALU operations.

- a) Conditional codes
- b) Multiplexer
- c) Control unit
- d) None of the mentioned

39. The registers, ALU and the interconnection between them are collectively called as \_\_\_\_\_

- a) process route
- b) information trail
- c) information path
- d) data path

40. \_\_\_\_\_ are used to overcome the difference in data transfer speeds of various devices.

- a) Speed enhancing circuitry
- b) Bridge circuits
- c) Multiple Buses
- d) Buffer registers

41. To extend the connectivity of the processor bus we use \_\_\_\_\_

- a) PCI bus
- b) SCSI bus
- c) Controllers
- d) Multiple bus

42. The ISA standard Buses are used to connect \_\_\_\_\_

- a) RAM and processor
- b) GPU and processor
- c) Harddisk and Processor
- d) CD/DVD drives and Processor

43. A processor performing fetch or decoding of different instruction during the execution of another instruction is called \_\_\_\_\_

- a) Super-scaling
- b) Pipe-lining
- c) Parallel Computation
- d) None of the mentioned

44. For a given FINITE number of instructions to be executed, which architecture of the processor provides for a faster execution?

- a) ISA
- b) ANSA
- c) Super-scalar
- d) All of the mentioned

45. The clock rate of the processor can be improved by \_\_\_\_\_

- a) Improving the IC technology of the logic circuits
- b) Reducing the amount of processing done in one step
- c) By using the overclocking method
- d) All of the mentioned

46. The ultimate goal of a compiler is to \_\_\_\_\_

- a) Reduce the clock cycles for a programming task
- b) Reduce the size of the object code
- c) Be versatile
- d) Be able to detect even the smallest of errors

47. When Performing a looping operation, the instruction gets stored in the \_\_\_\_\_

- a) Registers
- b) Cache
- c) System Heap
- d) System stack

48. The addressing mode/s, which uses the PC instead of a general purpose register is \_\_\_\_\_

- a) Indexed with offset
- b) Relative
- c) Direct
- d) Both Indexed with offset and direct

49. The addressing mode, where you directly specify the operand value is \_\_\_\_\_

- a) Immediate
- b) Direct
- c) Definite
- d) Relative

50. Which method of representation has two representations for '0'?

- a) Sign-magnitude
- b) 1's complement
- c) 2's complement
- d) None of the mentioned

51. The processor keeps track of the results of its operations using flags called \_\_\_\_\_

- a) Conditional code flags
- b) Test output flags
- c) Type flags
- d) None of the mentioned

52. The register used to store the flags is called as \_\_\_\_\_

- a) Flag register
- b) Status register**
- c) Test register
- d) Log register

53. The Flag 'V' is set to 1 indicates that \_\_\_\_\_

- a) The operation is valid
- b) The operation is validated
- c) The operation has resulted in an overflow**
- d) None of the mentioned

54. In the implementation of a Multiplier circuit in the system we make use of \_\_\_\_\_

- a) Counter
- b) Flip flop
- c) Shift register**
- d) Push down stack

55. A 24 bit address generates an address space of \_\_\_\_\_ locations.

- a) 1024
- b) 4096
- c) 248
- d) 16,777,216**

56. If a system is 64 bit machine, then the length of each word will be \_\_\_\_\_

- a) 4 bytes
- b) 8 bytes**
- c) 16 bytes
- d) 12 bytes

57. The type of memory assignment used in Intel processors is \_\_\_\_\_

- a) Little Endian**
- b) Big Endian
- c) Medium Endian
- d) None of the mentioned

58. To get the physical address from the logical address generated by CPU we use \_\_\_\_\_

- a) MAR
- b) MMU**
- c) Overlays
- d) TLB

59. When generating physical addresses from a logical address the offset is stored in \_\_\_\_\_

- a) Translation look-aside buffer
- b) Relocation register**
- c) Page table
- d) Shift register

60. The technique used to store programs larger than the memory is \_\_\_\_\_

- a) Overlays**
- b) Extension registers
- c) Buffers
- d) Both Extension registers and Buffers

61. The transfer of large chunks of data with the involvement of the processor is done by \_\_\_\_\_

- a) DMA controller**
- b) Arbitrator
- c) User system programs
- d) None of the mentioned

62. In a system, which has 32 registers the register id is \_\_\_\_\_ long.

- a) 16 bit
- b) 8 bits
- c) 5 bits
- d) 6 bits

63. The two phases of executing an instruction are \_\_\_\_\_

- a) Instruction decoding and storage
- b) Instruction fetch and instruction execution
- c) Instruction execution and storage
- d) Instruction fetch and Instruction processing

64. The instructions like MOV or ADD are called as \_\_\_\_\_

- a) OP-Code
- b) Operators
- c) Commands
- d) None of the mentioned

65. The utility program used to bring the object code into memory for execution is \_\_\_\_\_

- a) Loader
- b) Fetcher
- c) Extractor
- d) Linker

66. When parameters are being passed on to the subroutines they are stored in.....

- a) Registers
- b) Memory locations
- c) Processor stacks
- d) All of the mentioned

67. The most efficient way of handling parameter passing is by using \_\_\_\_\_

- a) General purpose registers
- b) Stacks
- c) Memory locations
- d) None of the mentioned

68. The data structure suitable for scheduling processes is \_\_\_\_\_

- a) List
- b) Heap
- c) Queue
- d) Stack

69. The process wherein the processor constantly checks the status flags is called as \_\_\_\_\_

- a) Polling
- b) Inspection
- c) Reviewing
- d) Echoing

70. The interrupt-request line is a part of the \_\_\_\_\_

- a) Data line
- b) Control line
- c) Address line
- d) None of the mentioned

71. An interrupt that can be temporarily ignored is \_\_\_\_\_

- a) Vectored interrupt
- b) Non-maskable interrupt
- c) Maskable interrupt
- d) High priority interrupt

72. Which interrupt is unmaskable?

- a) RST 5.5
- b) RST 7.5
- c) TRAP
- d) Both RST 5.5 and 7.5

73. When dealing with multiple devices interrupts, which mechanism is easy to implement?

- a) Polling method
- b) Vectored interrupts
- c) Interrupt nesting
- d) None of the mentioned

74. The processor indicates to the devices that it is ready to receive interrupts \_\_\_\_\_

- a) By enabling the interrupt request line
- b) By enabling the IRQ bits
- c) By activating the interrupt acknowledge line
- d) None of the mentioned

75. \_\_\_\_\_ method is used to establish priority by serially connecting all devices that request an interrupt.

- a) Vectored-interrupting
- b) Daisy chain
- c) Priority
- d) Polling

76. Interrupts initiated by an instruction is called as \_\_\_\_\_

- a) Internal
- b) External
- c) Hardware
- d) Software

77. If during the execution of an instruction an exception is raised then \_\_\_\_\_

- a) The instruction is executed and the exception is handled
- b) The instruction is halted and the exception is handled
- c) The processor completes the execution and saves the data and then handle the exception
- d) None of the mentioned

78. \_\_\_\_\_ is/are types of exceptions.

- a) Trap
- b) Interrupt
- c) System calls
- d) All of the mentioned

79. The program used to find out errors is called \_\_\_\_\_

- a) Debugger
- b) Compiler
- c) Assembler
- d) Scanner

80. facilities provided by the debugger is \_\_\_\_\_

- a) Trace points
- b) Break points
- c) Compile
- d) Both Trace and Break points

81. The instructions which can be run only supervisor mode are?

- a) Non-privileged instructions
- b) System instructions
- c) Privileged instructions
- d) Exception instructions

82. In DMA transfers, the required signals and addresses are given by the \_\_\_\_\_

- a) Processor
- b) Device drivers
- c) DMA controllers
- d) The program itself

83. Can a single DMA controller perform operations on two different disks simultaneously?

- a) True
- b) False

84. The primary function of the BUS is \_\_\_\_\_

- a) To connect the various devices to the cpu
- b) To provide a path for communication between the processor and other devices
- c) To facilitate data transfer between various devices
- d) All of the mentioned

85. The transformation between the Parallel and serial ports is done with the help of \_\_\_\_\_

- a) Flip flops
- b) Logic circuits
- c) Shift registers
- d) None of the mentioned

86. A narrow SCSI BUS has \_\_\_\_\_ data lines.

- a) 6
- b) 8
- c) 16
- d) 4

87. The maximum number of devices that can be connected to SCSI BUS is \_\_\_\_\_

- a) 12
- b) 10
- c) 16
- d) 8

88. The multiplier is stored in \_\_\_\_\_

- a) PC Register
- b) Shift register
- c) Cache
- d) None of the mentioned

89. The pipelining process is also called as \_\_\_\_\_

- a) Superscalar operation
- b) Assembly line operation
- c) Von Neumann cycle
- d) None of the mentioned

90. Each stage in pipelining should be completed within \_\_\_\_\_ cycle.

- a) 1
- b) 2
- c) 3
- d) 4

91. The situation wherein the data of operands are not available is called \_\_\_\_\_

- a) Data hazard
- b) Stock
- c) Deadlock
- d) Structural hazard

92. The computer architecture aimed at reducing the time of execution of instructions is \_\_\_\_\_

- a) CISC
- b) RISC
- c) ISA
- d) ANNA

93. In CISC architecture most of the complex instructions are stored in \_\_\_\_\_

- a) Register
- b) Diodes
- c) CMOS
- d) Transistors

94. If the page table is large then it is stored in \_\_\_\_\_

- a) Processor
- b) Main memory
- c) Disk
- d) Secondary storage

95. Whenever a request to the page that is not present in the main memory is accessed \_\_\_\_\_ is triggered.

- a) Interrupt
- b) Request
- c) Page fault
- d) None of the mentioned

96. When an operand is stored in a register it is \_\_\_\_\_

- a) Stored in the lower order bits of the register
- b) Stored in the higher order bits of the register
- c) Stored in any of the bits at random
- d) None of the mentioned

97. The main importance of ARM microprocessors is providing operation with \_\_\_\_\_

- a) Low cost and low power consumption
- b) Higher degree of multi-tasking
- c) Lower error or glitches
- d) Efficient memory management

98. In the ARM, PC is implemented using \_\_\_\_\_

- a) Caches
- b) Heaps
- c) General purpose register
- d) Stack

99. The LEA mnemonic is used to \_\_\_\_\_

- a) Load the effective address of an instruction
- b) Load the values of operands onto an accumulator
- c) Declare the values as global constants
- d) Store the outcome of the operation at a memory location

100. SIMD stands for \_\_\_\_\_

- a) Single Instruction Multiple Data
- b) Simple Instruction Multiple Decoding
- c) Sequential Instruction Multiple Decoding
- d) System Information Mutable Data

101. Any condition that causes a processor to stall is called as \_\_\_\_\_

- a) Hazard
- b) Page fault
- c) System error
- d) None of the mentioned

102. The time lost due to the branch instruction is often referred to as \_\_\_\_\_

- a) Latency
- b) Delay
- c) Branch penalty
- d) None of the mentioned

103. The logical addresses generated by the cpu are mapped onto physical memory by \_\_\_\_\_

- a) Relocation register
- b) TLB
- c) MMU
- d) None of the mentioned

104. A 16 X 8 Organization of memory cells, can store up to \_\_\_\_\_

- a) 256 bits
- b) 1024 bits
- c) 512 bits
- d) 128 bits**

105. To reduce the number of external connections required, we make use of\_\_\_\_\_

- a) De-multiplexer
- b) Multiplexer**
- c) Encoder
- d) Decoder

106. The time taken to transfer a word of data to or from the memory is called as\_\_\_\_\_

- a) Access time
- b) Cycle time
- c) Memory latency**
- d) None of the mentioned

107. The fastest data access is provided using \_\_\_\_\_

- a) Caches
- b) DRAM's
- c) SRAM's
- d) Registers**

108. The correspondence between the main memory blocks and those in the cache is given by \_\_\_\_\_

- a) Hash function
- b) Mapping function**
- c) Locale function
- d) Assign function

109. To extend the connectivity of the processor bus we use \_\_\_\_\_

- a) PCI bus**
- b) SCSI bus
- c) Controllers
- d) Multiple bus

110. The main purpose of having memory hierarchy is to \_\_\_\_\_

- a) Reduce access time
- b) Provide large capacity
- c) Reduce propagation time
- d) Reduce access time & Provide large capacity**

111. \_\_\_\_\_ is used to implement virtual memory organization.

- a) Page table
- b) Frame table
- c) MMU**
- d) None of the mentioned

112. \_\_\_\_\_ translates the logical address into a physical address.

- a) MMU**
- b) Translator
- c) Compiler
- d) Linker

113. The minimum number of transistors required to implement a two input AND gate is

- A. 2
- B. 4
- C. 6**
- D. 8

**114. A structure that stores a number of bits taken “together as a unit” is a**

- A. gate
- B. mux
- C. decoder
- D. register**

**115. Which register usually store the output generated by ALU in several arithmetic and logical operations?**

- a. Accumulator**
- b. Special Function Register
- c. Timer Register
- d. Stack Pointer

**116. Which operations are performed by stack pointer during its incremental phase?**

- a. Push**
- b. Pop
- c. Return
- d. All of the above

**117. What kind of instructions usually affect the program counter?**

- a. Call & Jump**
- b. Call & Return
- c. Push & Pop
- d. Return & Jump

**118. Which commands are used for addressing the off-chip data and associated codes respectively by data pointer?**

- a. MOVX & MOVC**
- b. MOVY & MOVB
- c. MOVZ & MOVA
- d. MOVC & MOVY

**119. Which instruction find its utility in loading the data pointer with 16 bits immediate data?**

- a. MOV**
- b. INC
- c. DEC
- d. ADDC

**120. What is the maximum capability of addressing the off-chip data memory & off-chip program memory in a data pointer?**

- a. 8K**
- b. 16K
- c. 32K
- d. 64K**

**121. How does the processor respond to an occurrence of the interrupt?**

- a. By Interrupt Service Subroutine**
- b. By Interrupt Status Subroutine
- c. By Interrupt Structure Subroutine
- d. By Interrupt System Subroutine

**122. The NAND gate output will be low if the two inputs are**

- (A) 00
- (B) 01
- (C) 10
- (D) 11**

**123. The number of control lines for a 8 – to – 1 multiplexer is**

- (A) 2
- (B) 3**
- (C) 4
- (D) 5

**124. How many Flip-Flops are required for mod-16 counter?**

- (A) 5
- (B) 6
- (C) 3
- (D) 4**

**129. How many select lines will a 16 to 1 multiplexer will have**

- (A) 4**
- (B) 3
- (C) 5
- (D) 1

**125. EPROM contents can be erased by exposing it to**

- (A) Ultraviolet rays.**
- (B) Infrared rays.
- (C) Burst of microwaves.
- (D) Intense heat radiations.

**126. Data can be changed from special code to temporal code by using**

- (A) Shift registers**
- (B) counters
- (C) Combinational circuits
- (D) A/D converters.

**127. The device which changes from serial data to parallel data is**

- (A) COUNTER
- (B) DEMULTIPLEXER**
- (C) MULTIPLEXER
- (D) FLIP-FLOP

**128. The access time of ROM using bipolar transistors is about**

- (A) 1 sec
- (B) 1 msec
- (C) 1  $\mu$ sec**
- (D) 1 nsec.

**130. The chief reason why digital computers use complemented subtraction is that it**

- (A) Simplifies the circuitry.
- (B) Is a very simple process.
- (C) Can handle negative numbers easily.**
- (D) Avoids direct subtraction

**131. Which one of the following offers CPUs as integrated memory or peripheral interfaces?**

**Microcontroller**

- (A) 5 bits.
- (B) 12 bits.**
- (C) 8 bits.
- (D) 10 bits.

## Digital Circuits/Logics and Discrete Mathematics

1. The systematic reduction of logic circuits is accomplished by.....
  - a) Symbolic reduction
  - b) TTL logic
  - c) Using Boolean algebra
  - d) Using a truth table
2. What is a Circuit?
  - a) Open-loop through which electrons can pass
  - b) Closed-loop through which electrons can pass
  - c) Closed-loop through which Neutrons can pass
  - d) None of the mentioned
3. Perform binary addition:  $101101 + 011011 = ?$ 
  - a) 011010
  - b) 1010100
  - c) 101110
  - d) 1001000
4. Whose operations are faster among the following?
  - a) Combinational circuits
  - b) Sequential circuits
  - c) Latches
  - d) Flip-flops
5. Which characteristic of IC in Digital Circuits represents a function of the switching time of a particular transistor?
  - a) Fan – out
  - b) Fan – in
  - c) Power dissipation
  - d) Propagation delay
6. When can one logic gate drive many other logic gates in Digital Electronics?
  - a) When its output impedance is low and the input impedance is low
  - b) When its output impedance is high and the input impedance is high
  - c) When its output impedance is high and the input impedance is low
  - d) When its output impedance is low and the input impedance is high
7. Transfer of one bit of information at a time is called \_\_\_\_\_
  - a) Rotating
  - b) Serial transfer
  - c) Parallel transfer
  - d) Shifting
8. When does a negative level triggered flip-flop in Digital Electronics changes its state?
  - a) When the clock is negative
  - b) When the clock is positive
  - c) When the inputs are all zero
  - d) When the inputs are all one
9. Which of the following is not a combinational circuit?
  - a) Adder
  - b) Code convertor
  - c) Multiplexer
  - d) Counter
10. What must be used along with synchronous control inputs to trigger a change in the flip flop?
  - a) 0
  - b) 1
  - c) Clock
  - d) Previous output
11. Total number of inputs in a half adder is \_\_\_\_\_.
  - a) 2
  - b) 3
  - c) 4
  - d) 1
12. In which operation carry is obtained?
  - a) Subtraction
  - b) Addition
  - c) Multiplication
  - d) Both addition and subtraction
13. What are the basic gates in MOS logic family?
  - a) NAND and NOR
  - b) AND and OR
  - c) NAND and OR
  - d) AND and NOR
14. If A and B are the inputs of a half adder, the sum is given by \_\_\_\_\_.
  - a) A AND B
  - b) A OR B
  - c) A XOR B
  - d) A EX-NOR B
15. If A and B are the inputs of a half adder, the carry is given by \_\_\_\_\_.
  - a) A AND B
  - b) A OR B
  - c) A XOR B
  - d) A EX-NOR B

- 16. What characteristic will a TTL digital circuit possess due to its multi-emitter transistor?**
- Low capacitance
  - High capacitance
  - Low inductance
  - High inductance
- 17. Half-adders have a major limitation in that they cannot \_\_\_\_\_**
- Accept a carry bit from a present stage
  - Accept a carry bit from a next stage
  - Accept a carry bit from a previous stage
  - Accept a carry bit from the following stages
- 18. The difference between half adder and full adder is \_\_\_\_\_**
- Half adder has two inputs while full adder has four inputs
  - Half adder has one output while full adder has two outputs
  - Half adder has two inputs while full adder has three inputs
  - All of the Mentioned
- 19. What value is to be considered for a “don’t care condition”?**
- 0
  - 1
  - Either 0 or 1
  - Any number except 0 and 1
- 20. If A, B and C are the inputs of a full adder then the sum is given by \_\_\_\_\_**
- A AND B AND C
  - A OR B AND C
  - A XOR B XOR C
  - A OR B OR C
- 21. How many AND, OR and EXOR gates are required for the configuration of full adder?**
- 1, 2, 2
  - 2, 1, 2
  - 3, 1, 2
  - 4, 0, 1
- 22. The register is a type of \_\_\_\_\_**
- Sequential circuit
  - Combinational circuit
  - CPU
  - Latches
- 23. What will a TTL digital circuit possess due to the presence of a multi – emitter transistor?**
- Smaller resistance
  - Larger area
  - Smaller area
  - Larger resistance
- 24. What will be the frequency of the output from a JK flip – flop, when J = 1, K = 1, and a clock with pulse waveform is given?**
- Half the frequency of clock input
  - Equal to the frequency of clock input
  - Twice the frequency of clock input
  - Independent of the frequency of clock input
- 25. The main difference between a register and a counter is \_\_\_\_\_**
- A register has no specific sequence of states
  - A counter has no specific sequence of states
  - A register has capability to store one bit of information but counter has n-bit
  - A register counts data
- 26. Which of the following gives the correct number of multiplexers required to build a 32 x 1 multiplexer?**
- Two 16 x 1 mux
  - Three 8 x 1 mux
  - Two 8 x 1 mux
  - Three 16 x 1 mux
- 27. 3 bits full adder contains \_\_\_\_\_**
- 3 combinational inputs
  - 4 combinational inputs
  - 6 combinational inputs
  - 8 combinational inputs
- 28. The simplified expression of full adder carry is \_\_\_\_\_**
- $c = xy + xz + yz$
  - $c = xy + xz$
  - $c = xy + yz$
  - $c = x + y + z$
- 29. Decimal digit in BCD can be represented by \_\_\_\_\_**
- 1 input line
  - 2 input lines
  - 3 input lines
  - 4 input lines
- 30. Which gate is called the anti – coincidence and coincidence gate respectively?**
- XNOR and XOR
  - AND and OR
  - OR and AND
  - XOR and XNOR
- 31. How many natural states will there be in a 4-bit ripple counter?**
- 4
  - 8
  - 16
  - 32

32. What determines the output from the combinational logic circuit in Digital Electronics?
- a) Input signals from the past condition
  - b) Input signals at the present moment
  - c) Input signals from both past and present
  - d) Input signals expected in future
33. A ripple counter's speed is limited by the propagation delay of \_\_\_\_\_
- a) Each flip-flop
  - b) All flip-flops and gates
  - c) The flip-flops only with gates
  - d) Only circuit gates
34. A modulus-10 counter must have \_\_\_\_\_
- a) 10 flip-flops
  - b) 4 Flip-flops
  - c) 2 flip-flops
  - d) Synchronous clocking
35. A counter circuit is usually constructed of \_\_\_\_\_
- a) A number of latches connected in cascade form
  - b) A number of NAND gates connected in cascade form
  - c) A number of flip-flops connected in cascade
  - d) A number of NOR gates connected in cascade form
36. How many types of the counter are there?
- a) 2
  - b) 3
  - c) 4
  - d) 5
37. Ripple counters are also called \_\_\_\_\_
- a) SSI counters
  - b) Asynchronous counters
  - c) Synchronous counters
  - d) VLSI counters
38. BCD counter is also known as \_\_\_\_\_
- a) Parallel counter
  - b) Decade counter
  - c) Synchronous counter
  - d) VLSI counter
39. A variable on its own or in its complemented form is known as a \_\_\_\_\_
- a) Product Term
  - b) Literal
  - c) Sum Term
  - d) Word
40. Canonical form is a unique way of representing \_\_\_\_\_
- a) SOP
  - b) Minterm
  - c) Boolean Expressions
  - d) POS
41. How many AND gates are required for a 1-to-8 multiplexer?
- a) 2
  - b) 6
  - c) 8
  - d) 5
42. How many types of flip-flops are there?
- a) 2
  - b) 3
  - c) 4
  - d) 5
43. What is a trigger pulse?
- a) A pulse that starts a cycle of operation
  - b) A pulse that reverses the cycle of operation
  - c) A pulse that prevents a cycle of operation
  - d) A pulse that enhances a cycle of operation
44. In D flip-flop, D stands for \_\_\_\_\_
- a) Distant
  - b) Data
  - c) Desired
  - d) Delay
45. A D flip-flop can be constructed from an \_\_\_\_\_ flip-flop.
- a) S-R
  - b) J-K
  - c) T
  - d) S-K
46. Which of the following is the Universal Flip-flop?
- a) S-R flip-flop
  - b) J-K flip-flop
  - c) Master slave flip-flop
  - d) D Flip-flop
47. The characteristic of J-K flip-flop is similar to \_\_\_\_\_
- a) S-R flip-flop
  - b) D flip-flop
  - c) T flip-flop
  - d) Gated T flip-flop
48. \_\_\_\_\_ is used to store data in registers.
- a) D flip flop
  - b) JK flip flop
  - c) RS flip flop
  - d) None of the mentioned
49. Which representation is most efficient to perform arithmetic operations on the numbers?
- a) Sign-magnitude
  - b) 1's complement
  - c) 2'S complement
  - d) None of the mentioned

50. A \_\_\_\_\_ gate is used to detect the occurrence of an overflow.
- a) NAND
  - b) **XOR**
  - c) XNOR
  - d) AND
51. The bit used to store whether the page has been modified or not is called as \_\_\_\_\_
- a) **Dirty bit**
  - b) Modify bit
  - c) Relocation bit
  - d) None of the mentioned
52. The Gray code for decimal number 6 is equivalent to
- a) 1100
  - b) **0101**
  - c) 1001
  - d) 0110
53. The 2's complement of the number 1101101 is
- a) 0101110
  - b) 0111110
  - c) 0110010
  - d) **0010011**
54. The code where all successive numbers differ from their preceding number by single bit is
- a) Binary code.
  - b) BCD.
  - c) Excess – 3.
  - d) **Gray.**
55. A device which converts BCD to Seven Segment is called
- a) Encoder
  - b) Multiplexer
  - c) **Decoder**
  - d) Demultiplexer
56. In a JK Flip-Flop, toggle means
- a) Set Q = 1 and Q = 0.
  - b) Set Q = 0 and Q = 1.
  - c) **Change the output to the opposite state.**
  - d) No change in output.
57. When the set of input data to an even parity generator is 0111, the output will be
- a) 1
  - b) **0**
  - c) Unpredictable
  - d) Depends on the previous input
58. A full adder logic circuit will have
- a) Two inputs and one output.
  - b) Three inputs and three outputs.
  - c) Two inputs and two outputs.
  - d) **Three inputs and two outputs**
59. Any signed negative binary number is recognized by its \_\_\_\_\_
- a) MSB
  - b) LSB
  - c) Byte
  - d) Nibble
60. What does RTL in digital circuit design stand for?
- a) Register transfer language
  - b) Register transfer logic
  - c) **Register transfer level**
  - d) Resistor-transistor logic
61. RTL mainly focuses on describing the flow of signals between \_\_\_\_\_
- a) Logic gates
  - b) **Registers**
  - c) Clock
  - d) Inverter
62. Which flip-flop is usually used in the implementation of the registers?
- a) **D flip-flop**
  - b) S-R flip-flop
  - c) T flip-flop
  - d) J-K flip-flop
63. Which of the following tool performs logic optimization?
- a) Simulation tool
  - b) **Synthesis tool**
  - c) Routing tool
  - d) RTL compiler
64. All input of NOR as low produces results as \_\_\_\_\_
- a) Low
  - b) Mid
  - c) **High**
  - d) Floating
65. The primary advantage of RTL technology was that \_\_\_\_\_
- a) It results as low power dissipation
  - b) It uses a minimum number of resistors
  - c) **It uses a minimum number of transistors**
  - d) It operates swiftly
66. The disadvantage of RTL is that \_\_\_\_\_
- a) It uses a maximum number of resistors
  - b) **It results in high power dissipation**
  - c) High noise creation
  - d) It uses minimum number of transistors

67. Diode-transistor logic (DTL) is the direct ancestor of \_\_\_\_\_

- a) Register-transistor logic
- b) Transistor-transistor logic
- c) High threshold logic
- d) Emitter Coupled Logic

68. The DTL propagation delay is relatively \_\_\_\_\_

- a) Large
- b) Small
- c) Moderate
- d) Negligible

69. CMOS behaves as a/an \_\_\_\_\_

- a) Adder
- b) Subtractor
- c) Inverter
- d) Comparator

70. Transistor-transistor logic (TTL) is a class of digital circuits built from \_\_\_\_\_

- a) JFET only
- b) Bipolar junction transistors (BJT)
- c) Resistors
- d) Bipolar junction transistors (BJT) and resistors

71. Which of the examples below expresses the commutative law of multiplication?

- a)  $A + B = B + A$
- b)  $A \cdot B = B + A$
- c)  $A \cdot (B \cdot C) = (A \cdot B) \cdot C$
- d)  $A \cdot B = B \cdot A$

72. The characteristic equation of S-R latch is \_\_\_\_\_

- a)  $Q(n+1) = (S + Q(n))R'$
- b)  $Q(n+1) = SR + Q(n)R$
- c)  $Q(n+1) = S'R + Q(n)R$
- d)  $Q(n+1) = S'R + Q'(n)R$

73. The difference between a flip-flop & latch is \_\_\_\_\_

- a) Both are same
- b) Flip-flop consist of an extra output
- c) Latches has one input but flip-flop has two
- d) Latch has two inputs but flip-flop has one

74. The S-R flip flop consist of \_\_\_\_\_

- a) 4 AND gates
- b) Two additional AND gates
- c) An additional clock input
- d) 3 AND gates

75. What is one disadvantage of an S-R flip-flop?

- a) It has no Enable input
- b) It has a RACE condition
- c) It has no clock input
- d) Invalid State

76. The basic latch consists of \_\_\_\_\_

- a) Two inverters
- b) Two comparators
- c) Two amplifiers
- d) Two adders

77. Why latches are called as memory devices?

- a) It has capability to store 8 bits of data
- b) It has internal memory of 4 bit
- c) It can store one bit of data
- d) It can store infinite amount of data

78. On a J-K flip-flop, when is the flip-flop in a hold condition?

- a)  $J = 0, K = 0$
- b)  $J = 1, K = 0$
- c)  $J = 0, K = 1$
- d)  $J = 1, K = 1$

79. Which of the following flip-flop is used by the ring counter?

- a) D flip-flops
- b) SR flip-flops
- c) JK flip-flops
- d) T flip-flops

80. In \_\_\_\_\_ universal clock is not used.

- a) Synchronous counter
- b) Asynchronous counter
- c) Decade counter
- d) Ring counter

81. State transition happens \_\_\_\_\_ in every clock cycle.

- a) Once
- b) Twice
- c) Thrice
- d) Four times

82. If there are n distinct components in a statement then there are ..... combinations of values in the truth table.

- a)  $2^n$
- b)  $n+1$
- c)  $n$
- d)  $n+2$

83. A relation R in a set X is symmetric if

- a)  $xRy, yRz \Rightarrow xRz$ .
- b)  $xRy$
- c)  $xRy \Rightarrow yRx$
- d)  $xRx$

84. If a relation is reflexive, then all the diagonal entries in the relation matrix must be
- a) 0
  - b) 1
  - c) 2
  - d) -1
85. If R is reflexive, symmetric and transitive then the relation is said to be
- a) Binary relation
  - b) Compatibility relation
  - c) Equivalence relation
  - d) Partial order relation
86. A mapping x into itself is called
- a) reflexive
  - b) symmetric
  - c) transitive
  - d) equivalence
87. The duality law of  $(P \wedge Q) \vee T$  is
- a)  $(P \wedge Q) \wedge T$
  - b)  $(P \vee Q) \wedge T$
  - c)  $(P \vee Q) \vee F$
  - d)  $(P \vee Q) \wedge F$
88. A sum of the variables and their negations in a formula is called
- a) elementary sum
  - b) elementary product
  - c) cnf
  - d) dnf
89. Min-terms of two statements are formed by introducing the connective
- a) Conjunction
  - b) disjunction
  - c) Conditional
  - d) negation
90. Any vertex having degree one is called
- a) Simple vertex
  - b) pendent vertex
  - c) regular vertex
  - d) complete vertex
91. A graph that has neither self-loops nor parallel edges is called ..... graph.
- a) regular
  - b) simple
  - c) complete
  - d) null
92. A graph in which every vertex has same degree is called ..... graph.
- a) regular
  - b) simple
  - c) complete
  - d) null
93. The number of vertices of odd degree in a graph is always
- a) odd
  - b) even
  - c) zero
  - d) one
94.  $P \rightarrow Q, Q \rightarrow R$  then
- a)  $P \rightarrow R$
  - b)  $R \rightarrow P$
  - c)  $Q$
  - d)  $R$
95. If a normal form contains all minterms, then it is
- a) a tautology
  - b) a contradiction
  - c) a contingency
  - d) both a and b
96. PCNF is also called
- a) sum of product canonical form.
  - b) product of sum canonical form
  - c) sum canonical form
  - d) product canonical form
97. Max-terms of two statements are formed by introducing the connective
- a) disjunction
  - b) conjunction
  - c) negation
  - d) conditional
98. A relation R is defined on the set of integers as  $xRy$  if and only if  $(x+y)$  is even. Which of the following statement is TRUE?
- a) R is not an equivalence relation.
  - b) R is an equivalence relation having one equivalence classes
  - c) R is an equivalence relation having two equivalence classes
  - d) R is an equivalence relation having three equivalence classes
99. The number of relations from  $A = \{a,b,c\}$  to  $B = \{1,2\}$  are
- a) 6
  - b) 8
  - c) 32
  - d) 64
100. The minimum number of edges in a connected graph with n vertices is
- a) n
  - b)  $n-1$
  - c)  $n+1$
  - d)  $n+2$

**101. The number of distinct simple graphs with up to three nodes is**

- a) 7
- b) 9
- c) 15
- d) 25

**102. Maximum number of edges in an n-node undirected graph without self-loops is**

- a)  $[n(n-a)]/2$
- b)  $n-1$
- c)  $n$
- d)  $[n(n+a)]/2$

**103. Number of distinct nodes in any elementary path of length p is**

- a) p
- b)  $p-1$
- c) **p+1**
- d)  $p^*1$

**104. The total number of edges in a complete graph of n vertices is**

- a) n
- b)  $n/2$
- c)  $[n(n-a)]/3$
- d) **[n(n-a)]/2**

**105. A directed complete graph of n vertices contains**

- a) one arrow between each pair of distinct vertices
- b) two arrows between each pair of distinct vertices
- c)  $n-1$  arrows between each pair of distinct vertices
- d) path between every two distinct vertices

**106. A directed graph G = (V, E) is said to be finite if its**

- a) set V of vertices is finite
- b) set V of vertices & set E of edges are finite
- c) set E of edges are finite
- d) no vertices & edges are repeated

**107. If a compound statement is made up of three simple statements then the number of rows in the truth table is**

- a) 2
- b) 4
- c) 6
- d) **8**

**108. Let R = {(3, 3), (6, 6), (9, 9), (12,12), (3,6), (6,3), (3, 9), (9, 3), (9, 12),(12,9)} be a relation on the set A = {3, 6, 9, 12}. The relation is**

- a) reflexive and transitive
- b) reflexive and symmetric
- c) symmetric and transitive
- d) equivalence relation

**109. Let R={(1,b),(3,d),(2,b)} and S={(b,4),(2,5),(d,a)} be a relation then R composition S=?**

- a)  $\{(1,b),(3,d),(2,b)\}$
- b)  $\{(1,4),(3,a),(2,4)\}$
- c)  $\{(4,b),(2,5),(3,a)\}$
- d)  $\{(1,d),(3,b),(2,c)\}$

**110. If R= {(x, 2x)} and S= {(x, 4x)} then R composition S=**

- a)  $\{(x, 4x)\}$
- b)  $\{(x, 2x)\}$
- c)  $\{(x, 8x)\}$
- d)  $\{(x, 10x)\}$

**111. Let R= {(1, 3), (4, 2), (2, 2), (3, 3), (1, 1),(4,4)} be a relation on the set A={1, 2, 3, 4}. The relation R is**

- a) transitive
- b) reflexive
- c) **not symmetric**
- d) function

**112. If a relation is reflexive then in the graph of a relation there must be a loop at**

- a) **each node**
- b) only first node
- c) any two nodes
- d) only first and last nodes

**113. The rank of the incidence matrix of any connected graph G with n vertices is**

- a) n
- b)  $n+1$
- c) **n-1**
- d)  $n-2$

**114. The number of 1's in each row of an incidence matrix of a graph G is equal to**

- a) **the degree of the corresponding vertices**
- b) the sum of degrees of all vertices
- c) the degree of the initial vertex
- d) the degree of the terminal vertex

**115. The number of vertices in a full binary tree is**

- a) **odd**
- b) even
- c) equal
- d) 0

**116. For a symmetric digraph, the adjacency matrix is**

- a) **symmetric**
- b) antisymmetric
- c) asymmetric
- d) symmetric and asymmetric

**117. The diagonal entries of  $A A^T$  where  $A$  is the adjacency matrix are the**

- a) outdegrees of the node
- b) indegrees of the nodes
- c) unit degree of the nodes
- d) in & out degrees of the nodes

**118. The total number of degrees of an isolated node is**

- a) 0
- b) 1
- c) 2
- d) 3

**119. If  $G$  is a connected planar graph then it has a vertex of degree**

- a) 3 or less
- b) 4 or less
- c) 5 or less
- d) 6 or less

**120. A formula consisting of disjunctions of min-terms is called**

- a) DNF
- b) CNF
- c) PDNF
- d) PCNF

**121. Boolean expression except 0 expressed in an equivalent form is called**

- a) canonical
- b) sum
- c) product
- d) standard ANSWER: A

**122. Every connected graph contains a**

- a) tree
- b) sub tree
- c) spanning tree
- d) spanning subtree

**123. Hamilton cycle is a cycle that contains every**

- a) path
- b) cycle
- c) vertex
- d) edge

**124.  $A = \{1,3,5,7,9\}$  is a**

- a) null set
- b) finite set
- c) singleton set
- d) infinite set

**125. To prove the statement  $P$  tautologically implies the statement  $Q$ , it is enough to prove that**

- a)  $P$  conditional  $Q$  is a contradiction
- b)  $P$  conditional  $Q$  is a tautology
- c)  $P$  biconditional is a contradiction
- d)  $P$  biconditional  $Q$  is a tautology

**126. Let  $R=\{(1,2),(3,4),(2,6)\}$  and  $S=\{(4,3),(2,5),(6,6)\}$  be a relation then  $R$  composite  $S=$**

- a)  $\{(1,5),(3,3),(2,6)\}$
- b)  $\{(1,5),(3,6),(2,5)\}$
- c)  $\{(4,4),(2,5),(3,3)\}$
- d)  $\{(1,1),(3,3),(2,2)\}$

**127. The binary relation  $R = \{(0, 0), (1, a)\}$  on  $A = \{0, 1, 2, 3, \}$  is**

- a) reflexive, not symmetric, transitive
- b) not reflexive, symmetric, transitive
- c) reflexive, symmetric, not transitive
- d) reflexive, not symmetric, not transitive

**128. If an edge  $e$  is said to join the vertices  $u$  and  $v$  then the vertices  $u$  and  $v$  are called**

- a) initial vertices
- b) terminal vertices
- c) ends of  $e$
- d) all the above

**129. Two vertices which are incident with the common edge are called ..... vertices.**

- a) distinct
- b) directed
- c) adjacent
- d) loops

**130. An edge with identical ends is called**

- a) complete graph
- b) bipartite graph
- c) loops
- d) link

**131. An edge with same ends is called**

- a) complete graph
- b) bipartite graph
- c) loops
- d) link

**132. In a graph if few edges have directions and few do not have directions then the graph is called**

- a) multi graph
- b) directed graph
- c) undirected graph
- d) mixed graph

**133. Each edge has one end in set  $X$  and one end in set  $Y$  then the graph  $(X, Y)$  is called ..... graph.**

- a) bipartite
- b) simple
- c) complete
- d) trivial

**134. If the graph G1 and G2 has no vertex in common**

**then it is said to be**

- a) disjoint
- b) edge disjoints
- c) union
- d) intersection

**135. The degree of vertex v in G is**

- a) number of edges of G incident with v
- b) number of loops in G
- c) number of links in G
- d) number of sub graph in G

**136. Each loop counting has ..... edges.**

- a) 1
- b) 2
- c) 3
- d) 4

## **Peripheral and Multimedia MCQ**

- 1. The high-speed memory between the main memory and the CPU called?**
- a) Register Memory  
**b) Cache Memory**  
c) Storage Memory  
d) Virtual Memory
- 2. Cache Memory is implemented using the DRAM chips.**
- a) True  
**b) False**
- 3. The Cache memory is implemented using the SRAM chips**
- a) True  
b) False
- 4. ..... memory is implemented using the semiconductor chips.**
- a) Cache  
**b) Main**  
c) Secondary  
d) Registers
- 5. Winchester disks are a type of \_\_\_\_\_**
- a) optical disks  
**b) magnetic disks**  
c) compact disks  
d) magnetic drives
- 6. The software substituted for hardware and stored in ROM is.....**
- a) Synchronous Software  
b) Package Software  
**c) Firmware**  
d) Middleware
- 7. For large data transfers, \_\_\_\_\_ is used.**
- a) DMA  
b) programmed I/O  
c) controller register  
d) none of the mentioned
- 8. The smallest entity of memory is called \_\_\_\_\_**
- a) Cell  
b) Block  
c) Instance  
d) Unit
- 9. The BOOT sector files of the system are stored in \_\_\_\_\_**
- a) Hard disk  
**b) ROM**  
c) RAM  
d) Fast solid state chips in the motherboard
- 10. The assembler stores the object code in \_\_\_\_\_**
- a) Main memory  
b) Cache  
c) RAM  
**d) Magnetic disk**
- 11. The DMA transfer is initiated by\_\_\_\_\_**
- a) Processor  
b) The process being executed  
**c) I/O devices**  
d) OS

12. The virtual memory bridges the size and speed gap between \_\_\_\_\_ and \_\_\_\_\_

- a) RAM and ROM
- b) RAM and Secondary memory**
- c) Processor and RAM
- d) None of the mentioned

13. ‘Burst refresh’ in DRAM is also called

- A. Concentrated refresh**
- B. Distributed refresh
- C. Hidden refresh
- D. None of the above

14. Which memory has read operation, byte erase, byte write and chip erase?

- A. RAM
- B. UVEPROM
- C. EEPROM**
- D. both (b) and (c)

15. EPROM uses an array of \_\_\_\_\_

- a) p-channel enhancement type MOSFET
- b) n-channel enhancement type MOSFET**
- c) p-channel depletion type MOSFET
- d) n-channel depletion type MOSFET

16. ROMs retain data when \_\_\_\_\_

- a) Power is on
- b) Power is off
- c) System is down
- d) All of the Mentioned**

17. What is the difference between static RAM and dynamic RAM?

- a) Static RAM must be refreshed, dynamic RAM does not
- b) There is no difference
- c) Dynamic RAM must be refreshed, static RAM does not**
- d) SRAM is slower than DRAM

18. Why did PROM introduced?

- a) To increase the storage capacity
- b) To increase the address locations
- c) To provide flexibility**
- d) To reduce the size

19. PROMs are available in \_\_\_\_\_

- a) Bipolar and MOSFET technologies
- b) MOSFET and FET technologies
- c) FET and bipolar technologies
- d) MOS and bipolar technologies**

20. How many types of fuse technologies are used in PROMs?

- a) 2
- b) 3**
- c) 4
- d) 5

21. The PROM starts out with \_\_\_\_\_

- a) 1s
- b) 0s**
- c) Null
- d) Both 1s and 0s

22. For implementation of PROM, which IC is used?

- a) IC 74187
- b) IC 74186**
- c) IC 74185
- d) IC 74184

23. Storage capacity of magnetic disk depends on

- A) tracks per inch of surface
- B) bits per inch of tracks
- C) disk pack in disk surface
- D) All of above**

**24. The ALU of a computer responds to the commands coming from**

A) Primary memory

**B) Control section**

C) External memory

D) Cache memory

**29. Mnemonic a memory trick is used in which of the following language?**

A) Machine language

**B) Assembly language**

C) High level language

D) None of above

**25. The output quality of a printer is measured by.....**

A) Dot per sq. inch

**B) Dot per inch**

C) Dots printed per unit time

D) All of the above

**30. An integrated circuit is.....**

A) A complicated circuit

B) An integrating device

C) Much costlier than a single transistor

**D) Fabricated on a tiny silicon chip**

**26. A physical connection between the microprocessor memory and other parts of the microcomputer is known as.....**

A) Path

**B) Address bus**

C) Route

D) All of the above

**31. The difference between memory and storage is that memory is \_\_\_\_\_ and storage is \_\_**

**A) Temporary, permanent**

B) Permanent, temporary

C) Slow, fast

D) All of above

**27. Which of the following produces the best quality graphics reproduction?**

A) Laser printer

B) Ink jet printer

**C) Plotter**

D) Dot matrix printer

**32. Which printer is very commonly used for desktop publishing?**

**A) Laser printer**

B) Inkjet printer

C) Daisywheel printer

D) Dot matrix printer

**28. A set of flip flops integrated together is called \_\_\_\_**

A) Counter

B) Adder

**C) Register**

D) None of the above

**33. In a computer \_\_\_\_\_ is capable to store single binary bit.**

A) Capacitor

**B) Flip flop**

C) Register

D) Inductor

**34. Which of the following memories allows simultaneous read and write operations?**

- A) ROM
- B) RAM**
- C) EPROM
- D) None of above

**35. Which of the following is a read only memory storage device?**

- A) Floppy Disk
- B) CD-ROM**
- C) Hard Disk
- D) None of these

**36. The memory which is programmed at the time it is manufactured**

- A) ROM
- B) RAM
- C) PROM**
- D) EPROM

**37. Which of the following memories needs refreshing?**

- A) SRAM
- B) DRAM**
- C) ROM
- D) All of above

**38. Which technology is used in Compact disks?**

- A) Mechanical
- B) Electrical
- C) Electro Magnetic
- D) Laser**

**39. Which of the following disk is fixed disk?**

- A) Hard Disks**
- B) Flash Disks
- C) Blu-Ray Disks
- D) DVDs

**40. Daisy wheel printer is a type of.....**

- A) Matrix printer
- B) Impact printer**
- C) Laser printer
- D) Manual printer

**41. Circular division of disks to store and retrieve data are known as.....**

- A) tracks**
- B) sectors
- C) cycles
- D) rings

**42. Which one of the following statements is true?**

- a) Cache memory is a small amount of memory which is a part of the Random-Access Memory
- b) Cache memory is used to temporarily hold instructions and data that the CPU is likely to reuse**
- c) Cache Memory is cheaper memory
- d) All of the above statements are true

**43. A light sensitive device that converts drawing, printed text or other images into digital form is**

- A. Keyboard
- B. Plotter
- C. Scanner**
- D. OMR

**44. Which of the following memory is non-volatile?**

- A. SRAM
- B. DRAM
- C. ROM**
- D. All of the above

**45. ROM is needed for storing an initial program called \_\_\_\_\_.**

- A. Computer Startup Loader
- B. OS Version
- C. Kernel
- D. Bootstrap Loader**

**46. The most advanced form of ROM is?**

- A. PROM
- B. RAM
- C. EEPROM**
- D. Cache Memory

**47. What technology of memory is Cache RAM usually?**

- A. DRAM
- B. Flash
- C. SRAM**
- D. EEPROM

**48. What is PCI (Peripheral Component Interconnect)?**

- A. A type of monitor
- B. A type of system bus**
- C. A kind of graphics
- D. A modem standard

**49. The process of determining which pixels will provide a better approximation to the desired line is known as\_\_\_\_\_.**

- (a) Scan conversion
- (b) Randomization
- (c) Rasterization**
- (d) Recreation

**50. Rasterization combined with the process of rendering the picture scan line order is known as \_\_\_\_\_**

- (a) Scan conversion**
- (b) Randomization
- (c) Recreation
- (d) None of the above

**51. Basic methods of projection are \_\_\_\_\_ and \_\_\_\_\_.**

- (a) Parallel and perspective**
- (b) Parallel and perceptive
- (c) Perceptive and perspective
- (d) None of the above

**52. Good graphics programming avoids the use of \_\_\_\_\_ operations whenever possible.**

- (a) Multiplications
- (b) Division
- (c) Floating point**
- (d) Integer

**53. For a \_\_\_\_\_ graphics device adjacent pixels on a scan line are likely to have the same characteristics.**

- (a) Random scan
- (b) Raster scan**
- (c) CRT
- (d) None of the above

**54. What is scan line coherence?**

- (a) Adjacent pixels on a scan line are likely to have different characteristics
- (b) Non-adjacent pixels on a scan line are likely to have different characteristics
- (c) Adjective pixels on a scan line are likely to have the same characteristics**
- (d) None of the above

**55. The edge flag algorithm is a \_\_\_\_\_ process**

- (a) One-step
- (b) Three-step
- (c) Two-step**
- (d) Four-step

**56. The First step of edge -flag algorithm is**

- (a) Fill
- (b) Scan line
- (c) Contour outline**
- (d) None of the above

**57. \_\_\_\_\_ is the process of extracting a portion of the database, is fundamental to several aspects of computer graphics.**

- (a) Projection**
- (b) Clipping
- (c) Rotation
- (d) Translation

**58. Clipping algorithm can be implemented in.....**

- (a) Software
- (b) Both a and b**
- (c) Hardware**
- (d) None of the above

**59. The object is held stationary while the coordinate system is moved relative to the object is called.....**

- (a) Geometric Transformation**
- (b) Coordinate transformation
- (c) Translation
- (d) Rotation

**60. The object is held stationary while the coordinates system is moved relation to the object is called.**

- (a) Geometric transformation
- (b) Coordinate transformation**
- (c) Translation
- (d) Rotation

**61. The object is displaced a given distance and direction its original position is called**

(a) Translation

(b) Rotation

(c) Transformation

(d) Scaling

**65. An optical drive uses the ..... To read data.**

a. Magnetize particle

b. Electric particle

c. Reflected light

d. Refracted light

**62. \_\_\_\_\_ is the process of expanding or compressing the dimensions of an object.**

(a) Translation

(b) Rotation

(c) Transformation

(d) Scaling

**63. In Perspective Projection eye of the artist is placed at the**

(a) Left of projection

(b) Right of projection

(c) Top of projection

(d) Center of projection

**64. Flash memory was developed taking the concept of.....**

a. EPROM

b. EEPROM

c. DRAM

d. SRAM

## Miscellaneous

1. A girl introduced a boy as the son of the daughter  
the father of her uncle. The boy is girls....
  - a) Brother
  - b) Uncle
  - c) Son
  - d) Nephew
2. What will be the equation of the line that passes through the point (1, 2) and is parallel to  $2x+3y=4$ ?
  - a)  $2x+3y=8$
  - b)  $3x+2y=4$
  - c)  $3x+2y=4$
  - d)  $2x+3y=0$
3. Synonym of PROBITY
  - a) Probability
  - b) Honesty
  - c) Peaceful
  - d) Carelessness
4. What is the following is the subset of {b c d}?
  - a) {}
  - b) {n}
  - c) {1, 2, 3}
  - d) {a, b, c}
5. The perpendicular of the line  $2x+3y=4$  is
  - a)  $3x-2y=4$
  - b)  $3x+2y=4$
  - c)  $2x-3y=4$
  - d)  $2x-3y=0$
6. Arithmetic and geometric mean of X and Y will be the same if
  - a)  $X=Y$
  - b)  $X=\sqrt{Y}$
  - c)  $Y=\sqrt{X}$
  - d)  $X = Y/2$
7. Unsupervised learning is an example of.....
  - a) Classification and prediction
  - b) Classification and Regression
  - c) clustering
  - d) Data Mining
8. K-means technique is based on.....
  - a) Centroid Object
  - b) Reference object
  - c) Representative object
  - d) Partition Object
9. The objective of \_\_\_\_ is to find problems and fix them to improve quality of a project.
  - a) Software bug
  - b) Software complexity
  - c) Software testing
  - d) Software development
10. Unit testing is to test the \_\_\_\_ of the units.
  - a) Performance
  - b) System issues
  - c) Functionality
  - d) Hardware failure
11. \_\_\_\_ is an umbrella activity that is applied throughout the software process.
  - a) Software Quality Assurance
  - b) Software Quality Management
  - c) Software Quality Testing
  - d) Software Quality Engineering
12. The goal of software assurance is to reduce \_\_\_\_.
  - a) Cost
  - b) Risks
  - c) Time
  - d) Quality
13. What does CSA stand for?
  - a) Computer Speed Addition
  - b) Computer System Addition
  - c) Class Speed Addition
  - d) Computer Speed Algorithm
14. Software is defined as .....
  - a) Set of programs, documentation & configuration of data
  - b) Data about Data
  - c) Set of rules
  - d) None
15. CASE stands for.....
  - a) Computer-Aided Software Engineering
  - b) Computer-Associated Software Engineering
  - c) Computer-Aided System Engineering
  - d) None

16. \_\_\_\_\_ is defined as the process of generating analysis and designing documents?
- a) Reverse Engineering
  - b) Software Engineering
  - c) System Engineering
  - d) None
17. \_\_\_\_\_ is not suitable for accommodating any change?
- a) Waterfall Model
  - b) Spiral Model
  - c) Central Model
  - d) None
18. Software Debugging is known as \_\_\_\_\_
- a) finding and correcting errors in the program code
  - b) Software Management
  - c) Software Distribution
  - d) None
19. Who is responsible for the creation of the symbol table?
- a) Compiler
  - b) OS
  - c) File System
  - d) None
20. Characters are grouped into tokens in which of the following phase of the compiler design?
- a) Lexical Analyzer
  - b) Parsing
  - c) Prepressing
  - d) None
21. Among the following process, which process is known as the elimination of parts of a scene outside a window or a viewport?
- a) Clipping
  - b) View
  - c) Index
  - d) None
22. Which of the following is the process of digitizing a given picture definition into a set of pixel-intensity for storage in the frame buffer?
- a) Scan Conversion
  - b) Data Conversion
  - c) Data Streaming
  - d) None
23. Which of the following algorithm is a faster method for calculating pixel positions?
- a) DDA line algorithm
  - b) RSA Algorithm
  - c) GIU Algorithm
  - d) None
24. Which part of the Unix operating system interacts with the hardware?
- a) Kernel
  - b) System Call
  - c) Interactor
  - d) None
25. Which of the following is the first and foremost step in Image Processing?
- a) Image acquisition
  - b) Image Coloring
  - c) Image Conversion
  - d) None
26. Which of the following is used to capture data from the physical world in IoT devices?
- a) Sensors
  - b) Repeaters
  - c) Modem
  - d) None
27. Which method do we use to find the best fit line for data in Linear Regression?
- a) Least square error
  - b) Square error
  - c) Most square error
  - d) None

28. Which of the following method do we use to best fit the data in Logistic Regression?
- a) Maximum Likelihood
  - b) Minimum Likelihood
  - c) Average Likelihood
  - d) None
29. Regression Trees are often used to model ..... data?
- a) Non-Linear
  - b) Linear
  - c) Algebraic
  - d) None
30. ..... is a part of machine learning that works with neural networks?
- a) Deep Learning
  - b) Self Learning
  - c) Shallow Learning
  - d) None
31. Supervised learning differs from unsupervised clustering in that supervised learning requires .....
- a) Input attributes to be categorical
  - b) Output attributes to be categorical
  - c) Input attributes to be scattered
  - d) None
32. High entropy means that the partitions in classification are .....
- a) Not Pure
  - b) Pure
  - c) Both
  - d) None
33. All data is labelled and the algorithm learn to predict the output from the input data is .....
- a) Supervised Learning
  - b) Unsupervised Learning
  - c) Semi Supervised Learning
  - d) None

# English

## **Deadly 99 Meaning, Synonym, Antonym**

Word	Meaning	Synonym	Antonym
1. <b>Omnipotent</b>	Having unlimited power.	almighty	powerless
2. <b>Diffuse</b>	spread over a wide area or between a large number of people	spread	Limited
3. <b>Contend</b>	struggle to surmount	Argue	Engage
4. <b>Rebel</b>	A person who rises in opposition or armed resistance against an established government or leader	Revolutionary	obey
5. <b>Fallacy</b>	A mistaken belief one based on unsound arguments	Misconception	Conception
6. <b>Amicable</b>	Characterized by friendliness	Cordial	Unfriendly /hostile
7. <b>Curtail</b>	Reduce in extend or quantity	cut	Increase
8. <b>Mutter</b>	Say something in low or barely voice	Talk under one's breath	Speak out
9. <b>Gasp</b>	Cath one's breath with open mouth	puff	Succeed
10. <b>Nebulous</b>	In one form of cloud and hazy	Hazy	Clear /well defined
11. <b>Hazy</b>	Covered by haze	Misty /foggy /cloudy	Bright /sunny
12. <b>Porous</b>	Of rock or other material	Permeable	Impermeable
13. <b>Starry</b>	Full of or lit by stars	Heavenly, shining	Clear eyed
14. <b>Cognizance</b>	Knowledge of awareness	Knowledge	Unfamiliarity/ignorance

<b>15. Mirage</b>	An optical illusion caused by atmospheric condition	Hallucination	Reality
<b>16. Recondite</b>	Of subject knowledge	Abstract	Straight forward
<b>17. Sardonic</b>	grimly mocking or cynical.	mocking	Calm/Kind/mild/nice.
<b>18. Dearth</b>	a scarcity or lack of something.	shortage	abundance, plenty, sufficiency
<b>19. Turbulent</b>	characterized by conflict, disorder, or confusion; not stable or calm	Rough	Peaceful
<b>20. Placid</b>	not easily upset or excited	Clam	Disturbed/ loud/ noisy
<b>21. Barren</b>	(of land) too poor to produce much or any vegetation.	Unproductive	Fertile, productive
<b>22. Outspoken</b>	frank in stating one's opinions	direct	Diplomatic
<b>23. EFFACE</b>	erase (a mark) from a surface.	Keep out of sight	Make one's presence felt
<b>24. MYOPIC</b>	short-sighted	Purblind	Long-sighted
<b>25. DISSIPATE</b>	disappear or cause to disappear	waste	save
<b>26. TEPID</b>	only slightly warm; lukewarm	Cool	Hot
<b>27. AMBIGUOUS</b>	not clear or decided	Arguable	Clear
<b>28. Caustic</b>	able to burn or corrode organic tissue by chemical action	Acid	kind
<b>29. Timidity</b>	lack of courage or confidence	cowardliness	guts
<b>30. Enliven</b>	make (something) more entertaining, interesting, or appealing.	Cheer up	Bore /clam / exhaust
<b>31. UNGAINLY</b>	(Of a person or movement) awkward; clumsy.	Awkward	Elegant
<b>32. Slender</b>	of a person or part of the body) gracefully thin	slim	fat
<b>33. Restrained</b>	characterized by reserve or moderation	Soft	Emotional
<b>34. Decisive</b>	settling an issue	Final	Insignificant
<b>35. Coextensive</b>	extending over the same area, extent, or time.	coincident	Unequal
<b>36. August</b>	respected and impressive.	Respected	silly
<b>37. Hasty</b>	done with excessive speed or urgency; hurried.	Rapid	Slow
<b>38. Accord</b>	give or grant someone	give	remove
<b>39. Adversity</b>	a difficult or unpleasant situation	Bad luck	Good times
<b>40. Callous</b>	showing or having an insensitive and cruel disregard for others	unfeeling	benevolent,

<b>41. Captivity</b>	the condition of being imprisoned or confined	internments	Freedom
<b>42. Consolidate</b>	make (something) physically stronger or more solid	Combine	Decrease
<b>43. Contrary</b>	the opposite.	reverse	Same
<b>44. Condemn</b>	express complete disapproval of; censure	censure	praise
<b>45. Concord</b>	agreement or harmony between people or groups.	Unity	Discord
<b>46. Cunning</b>	having or showing skill in achieving one's ends by deceit or evasion	wily	Honest
<b>47. Decay</b>	the state or process of rotting or decomposition.	Rotting	building
<b>48. Demolish</b>	pull or knock down	Destroy	build
<b>49. Deliberate</b>	done consciously and intentionally.	Conscious	Accidental
<b>50. Fallacy</b>	A mistaken belief one based on unsound arguments	Misconception	Conception
<b>51. Fragile</b>	(of an object) easily broken or damaged.	Breakable	robust
<b>52. Hazard</b>	a danger or risk.	Threat	keep safe
<b>53. Impulsive</b>	acting or done without forethought.	Hasty	premeditated
<b>54. Immense</b>	extremely large or great, especially in scale or degree	Massive	Tiny
<b>55. Immaculate</b>	perfectly clean, neat, or tidy.	Clean	Bad
<b>56. Impartial</b>	treating all rivals or disputants equally	neutral	biased
<b>57. Ingenuous</b>	(of a person or action) innocent and unsuspecting.	naive	disingenuous
<b>58. Destitute</b>	extremely poor and lacking the means to provide for oneself.	devoid	destitute
<b>59. Candor</b>	the quality of being open and honest; frankness.	frankness	insincerity
<b>60. Lucid</b>	expressed clearly; easy to understand	intelligible	Unclear

<b>61. Optimist</b>	a person who tends to be hopeful and confident about the future or the success of something	dreamer	cynic
<b>62. Placid</b>	not easily upset or excited	Clam	Disturbed/ loud/ noisy
<b>63. Pompous</b>	affectedly grand, solemn, or self-important.	self-important	Modest
<b>64. Reluctant</b>	unwilling and hesitant; disinclined	resistant	ready
<b>65. Remorse</b>	deep regret or guilt for a wrong committed.	Guilt	happiness.
<b>66. Reverence</b>	deep respect for someone or something	Honor	Disrespect
<b>67. Ruthless</b>	having or showing no pity or compassion for others.	Cruel	Merciful
<b>68. Slander</b>	make false and damaging statements about (someone)	Defame	Acclaim
<b>69. Tedium</b>	too long, slow, or dull; tiresome or monotonous.	dull	Exciting
<b>70. Timid</b>	lack of courage or confidence	cowardliness	guts
<b>71. Wicked</b>	evil or morally wrong.	Naughty	Lousy
<b>72. Augment</b>	make (something) greater by adding to it; increase.	Increase	Decrease
<b>73. Eminent</b>	(of a person) famous and respected within a particular sphere.	Illustrious	unimportant
<b>74. Prominent</b>	important; famous	famous	Unknown
<b>75. Procession</b>	a number of people or vehicles moving forward in an orderly fashion, especially as part of a ceremony.	march	Stand still
<b>76. Endurable</b>	able to be endured; bearable.	Bearable	Unbearable
<b>77. Applaud</b>	show approval or praise by clapping.	Clap	Hiss
<b>78. Valiant</b>	possessing or showing courage or determination.	Fearless	Scare
<b>79. Scatter</b>	occurring or found at intervals or various locations rather than all together.	Break up	Assemble
<b>80. Tentative</b>	not certain or fixed; provisional.	Uncertain	Definite
<b>81. Indigent</b>	a needy person.	Poor	Rich
<b>82. Plethora</b>	A large or excessive amount of something	excess	lack

<b>83. Commencement</b>	the beginning of something	Strat	End
<b>84. Preface</b>	an introduction to a book, typically stating its subject, scope, or aims.	Prefix	Envoi
<b>85. Homogeneous</b>	of the same kind; alike.	Alike	Different
<b>86. Colossal</b>	extremely large or great	Large	Small
<b>87. Accumulate</b>	gather together or acquire an increasing number or quantity of.	Gather	dissipate
<b>88. Adversary</b>	one's opponent in a contest, conflict, or dispute.	Foe	Friend
<b>89. Clumsy</b>	(Of a person or movement) awkward; clumsy.	Awkward	Elegant
<b>90. Fidelity</b>	faithfulness to a person, cause, or belief, demonstrated by continuing loyalty and support.	loyalty	alienation
<b>91. Fragile</b>	(of an object) easily broken or damaged.	Breakable	robust
<b>92. Judicious</b>	having, showing, or done with good judgement or sense.	wise	Foolish
<b>93. Ominous</b>	giving the worrying impression that something bad is going to happen; threateningly inauspicious.	Doomy	auspicious
<b>94. Placid</b>	not easily upset or excited	Clam	Disturbed/ loud/ noisy
<b>95. Profound</b>	(of a state, quality, or emotion) very great or intense.	Keen	mild
<b>96. Reluctant</b>	unwilling and hesitant; disinclined	grudging	Eager
<b>97. Stubborn</b>	having or showing dogged determination not to change one's attitude or position on something, especially in spite of good arguments or reasons to do so.	willful	compliant
<b>98. Tangible</b>	perceptible by touch	material	intangible
<b>99. Vague</b>	of uncertain, indefinite, or unclear character or meaning.	Rough	Clear

## Right form of verbs

1. We have been living here since 2001.
2. The people of Bangladesh are simple.
3. The brave are always winners.
4. The rise and fall is inevitable.
5. Many a student is present here.
6. Two dozen makes 24.
7. One of the boys is nice.
8. He has been punished.
9. Half of the work is done.
10. Neel with his brother is present.
11. There is a book on the Shelf.
12. Without knowing I will not tell her.
13. We can't help laughing.
14. The book is worth reading.
15. I prefer running to playing.
16. I made her do the work.
17. I watched him living away.
18. You would rather go there.
19. I saw him to go.
20. I met him last night.
21. I wish I could fly.
22. I fancy I turned a trifle pale.
23. It is many years since I saw you.
24. I already have forgot his address.
25. Have you ever been to Cox's Bazar?
26. He has left the place just now.
27. Have you seen her lately?
28. A number of students were present in the class.
29. We went there with a view to seeing you.
30. Would you mind taking a cup of tea?
31. One and a half, lemons are enough.
32. Five miles is not a long distance.
33. He wanted the picture to be seen.
34. Neither She nor her sisters are present here.
35. The committee were divided on the decision.
36. The police are the friends of the people.
37. Neither of the two men is responsible.
38. Money in addition to honor makes men unhappy.
39. He said that ice floating on water was blue.
40. Many years have passed since I visited Taj Mahal.
41. No sooner had they reached the station, then the train left.
42. The rain having stopped We started our journey.
43. No, sooner had the teacher entered the class Then the students stood up.
44. We caught a thief last night.
45. The headmaster had entered into the class before the students came.
46. When does Mr. Kamal take his breakfast?
47. I have read the book recently.
48. It is many years since I came to your house.
49. We started the meeting after the guest has been coming.
50. You must better do the work.
51. The boy ran away having taken the first prize.
52. I went to market last night with a view to buying a shirt.
53. It is high time I changed my character.
54. He speaks as though he were a mad.
55. The book has been published.
56. If you helped the boy he would help you.
57. He ran fast least he should miss the train.
58. While reading a book I saw a picture of an ox.
59. Ill news runs quickly.

60. No buses and no rickshaws **are** on the road.
61. None of the girls **has** qualified.
62. The wall **has been** printed.
63. Rice and curry **is** my favorite food.
64. Cattle **are** grazing in the field.
65. The family **is** unanimous in the opinion.
66. The virtuous **are** always happy.
67. One of the students **does** his homework.
68. Two plus two **makes** four.
69. You, he and I **are** friends.
70. Rahim as well as his friends **does** well.
71. I found the boy **crying** on the bed.
72. I was **called** there yesterday.
73. Why **did** you go to market yesterday?
74. It is no use **spoiling** time by gossiping.
75. He talked as if he **had** known everything.
76. You had better **do** the work.
77. I wish I **met** you ten years earlier.
78. The students **are not prepared** to take the examination.
79. She is shocked because she **has seen** a terrible accident.
80. While he was **walking** in the garden a snake bit him.
81. Lack of exercise and high fat diet **have long been** known to be factors in heart attack.
82. Complete shutdown **is being observed** today against new law.
83. He talks as though he **were** a child.
84. He advised me to give up **smoking**.
85. Why have you **done** this?
86. It is high time you **tried** for a job.
87. I look forward to **hearing** from you.
88. Each of the boys **is present** in the class.
89. I wish I **were** a philosopher.
90. Slow and steady **wins** the race.
91. It is high time we **left** the place.
92. Would you mind **closing** the door please?
93. English is **spoken** across the world.
94. I wish you **could** solve the problem.
95. It is high time we **gave up** smoking.
96. Have you finished **reading** the book?
97. An intensive search was conducted by the detective to locate those criminals who **had Escaped**.
98. We waited until the plane **had taken off**.
99. He **gave up** playing football when he got married.
100. She **burnt** her hand when she was cooking dinner.
101. In many ways riding a bicycle **is** similar to driving a car.
102. I **have been** living in Dhaka since 1999.
103. The building **has been** left unoccupied since 1999.
104. How many times **have you had** your house broken into?
105. He is used to **smoking**.
106. The laptop was **stolen** by a thief.
107. It is many years since he **came** to Dhaka.
108. You, he and I **are** going to Dhaka.
109. As soon as the teacher entered the classroom, all the students **stood up**.
110. I **met** my favorite teacher yesterday.
111. He ran fast lest he **should** miss the train.
112. Would that I **could** buy the car.
113. Do not go anywhere until he **comes** back.
114. I will carry an umbrella in case it **rains**.
115. She prefers **dancing to singing**.
116. He intends to **stay** in the country for two months.
117. He wanted the movie to **be watched**.
118. Hasan **has chosen** the right path.
119. Its no use **talking** to him.

- 120.Would you mind **closing** the door?
- 121.I don't mind **helping with** the cooking but I am not going to wash the dishes.
- 122.Some days **have passed** since my father died.
- 123.It is the high time we **discussed** the matter.
- 124.Where did the accident **happen**?
- 125.As the sun was shining, I **decided** to go out.
- 126.We were watching the news when the telephone **rang**.
- 127.I opened the door as soon as I **heard** the bell.
- 128.He **moved** to Chicago just a few months ago.
- 129.**Have you finished** the work yet?
- 130.Don't make a noise while your father **is sleeping**.
- 131.As soon as I **have** thought about her, she calls me.

## Preposition Practice

1. He felt nothing but hatred **for** the person who attacked him.
2. There are many advantages **of** speaking foreign languages.
3. I have a lot **of** respect for the teachers I had **at** school.
4. I'd like to do a course **in** computer programming.
5. He was **on** trial **for** having murdered his wife.
6. We went to see an exhibition **on** Egyptian history.
7. I had an argument **with** my boss yesterday.
8. He took away my bag **by** force.
9. Her fear **of** flying made travelling very difficult **for** her.
10. My dad had difficulty **in** making himself understood.
11. I've got a meeting **with** John this afternoon.
12. **By** the time I arrived, the train had already left.
13. If you're **in** doubt, please call the ambulance.
14. We had access **to** the internet in all the hotels we stayed **at**.
15. We took part **in** the activities that the school offered.
16. Suits will never be **out** of fashion.
17. She's **on** leave until the end of the month.
18. The two countries were **at** peace with each other.
19. You have absolutely no reason to talk **to** me like that.
20. We'd like to have a room **with** a view of the sea.
21. The fire was now **out** of control.
22. She was able to describe the accident **in** detail.
23. The trousers are **on** sale at the moment.
24. It sounds great **in** theory, but will your plan work?
25. I learned to drive **at** the age of 18.
26. Those trousers went **out of** fashion many years ago.
27. We heard about the natural disaster **from/on** the news.
28. I was **under** the impression that we didn't want to offend him.
29. Unemployment is **on** the increase in many European countries.
30. I don't know **for** certain, but I think she's on leave at the moment.
31. There was nothing there anymore, so we had to start **from** scratch.

32. I ran **into** my old teacher the other day. It was nice to meet him again.
33. The unexpected success of the company took us **by** surprise.
34. All trains leaving from platform 4 are **on** time.
35. **In** my opinion, she must be the greatest athlete of all times.
36. There is a big ceremony being held **in** honor of the killed soldiers.
37. I'm sorry. I must have done it **by** mistake.
38. She waved me good-bye until our car was **out of** sight.
39. I am not allowed to give them any alcohol. They are all **under** age.
40. He told us **in** brief what he wanted to do, but didn't go into much detail.
41. Jack has gone to New York **on** business.
42. You must be tired. Why don't you take a break **for** a change?
43. We have to be there **by** ten at the latest. Otherwise, they won't let us in.
44. My mother is suffering **from** cancer and there is not much hope for her.
45. They had to translate the document from English **into** Spanish.
46. When we met **at** university it was love **at** first sight.
47. I went home **at** midnight because I was so tired.
48. They didn't give her any alcohol because she was **under** age.
49. I was so distracted that I put salt into my coffee **by** accident.
50. There is no solution **to** this problem.
51. John has a reputation **for** being late all the time.
52. She hasn't got any money left. **In** other words, she's broke.
53. Could you call tomorrow? I'm not **in** such a good mood today.
54. She took me **by** the hand, and we walked along the beach.
55. I washed his car **in** exchange **for** some pocket money.
56. This is my first visit **to** Singapore.
57. I had a lot of fun **at** the summer camp and improved my English **at** the same time.
58. I studied history and geography **at** university.
59. The bridge was closed **for/at** the weekend because it was **under** repair.
60. I always buy eggs **by** the dozen.
61. His talent **for** singing was impressive.

62. We had to learn all the poems **by** heart.
63. The decision that the officials made is still **under** review.
64. I left him **in** charge **of** all the network servers.
65. I'm sorry but the book is **out** of print at the moment.
66. We have to tidy up the house. It's **in** such a mess.
67. I couldn't hide my love **for** her any longer
68. I try to buy fruit and vegetables that are **in** season.
69. The question took him **by** surprise.
70. Smoking in public places is **against** the law in many countries.
71. The boss looked **down** on him arrogantly.
72. Many products sold at the market have been carefully manufactured **by** hand.
73. Many of the trains leaving London are currently running **behind/on** schedule.
74. We were terrified **with** fear when we saw what had happened.
75. They can't afford very much because they must live **on** the father's small pension.
76. Many species in the Amazon rain forest are **at** risk of becoming extinct.
77. A large part of the Netherlands lies **below** sea level.
78. My sister has been suffering **from** a nervous breakdown over the past few weeks.
79. When the interview was over the journalist asked the politician a few things **off** the record.
80. Strawberries are not **in** season at the moment, so we'll have to use other fruits.
81. You'll have to call an ambulance. There are no doctors **on** duty right now.
82. There are a few islands just miles **off** the coast.
83. If global warming continues **at** the present rate sea levels will rise very quickly.
84. I'm sorry. I lost the documents **by** accident. I didn't do it **on** purpose.
85. I have to be at home **by** midnight **at** the latest.
86. He left a few days ago and we haven't heard from him **since** then.
87. The famous poet was born **on** the 12<sup>th</sup> of May **in** 1867.

88. Turn right **at** the first traffic lights, then turn left.
89. William of Normandy conquered Britain **in** 1066.
90. They live at the end **of** the street.
91. Judy has lost weight because she always goes to fitness classes **after** work.
92. We'll meet the day **after** tomorrow.
93. I saw the information **on** the internet.
94. Please handle these new porcelain plates **with** care.
95. The dog was run over **by** a car.
96. The shops are open **from** 9 to 5 today.
97. The town lies halfway **between** Rome and Naples.
98. They had to send **for** the doctor because his condition was getting worse.
99. The young boy was raised **by** his stepfather.
100. I didn't feel safe when I was walking home **from** the disco.
101. The valuable painting dates back **to** the 12<sup>th</sup> century.
102. Maria often travels abroad. It's part **of** her job.
103. I arranged to meet my friend **at** the corner of James and Bond Street.
104. The teacher was very pleased **with** what we had done.
105. Jane had to hurry in order to arrive at the meeting **in** time.
106. We usually go to school **by** bus.
107. We moved **to** the north side of London a few years ago.
108. The village is not **on** the map. It must be very small.
109. It was a very long voyage. We were **at** sea for over four weeks.
110. The headmaster is **on** good terms with his whole teaching staff.
111. She was completely **out of** breath when she crossed the finish line.
112. All of the carpets on display were made **by** hand.
113. After we passed the last bend the city finally came **into** sight.
114. The teacher handed **out** the test sheets and the students started to work.
115. The sign says: "Beware **of** the dog!"
116. Every day millions of people travel **by** plane.
117. The doctor told me to give **up** smoking, otherwise I would have serious healthproblems.
118. My sister is suffering **from** cancer. She's only got a few more months.

119. The old man died **of** a heart attack.
120. The ski resort lies 1600 meters **above** sea level.
121. They couldn't walk **across** the bridge because it had been completely destroyed.
122. She was surprised **at/by** the girl's aggressive behavior.
123. A really good friend never lets you **down**.
124. It's ridiculous to wear such clothes. They've been **out of** fashion for a long time.
125. I wanted to speak to the person **in** charge of security matters.
126. Why are you so mad **at** me? I haven't done anything wrong.
127. Those paintings **on** the wall date back to the 16<sup>th</sup> century.
128. When I saw how disappointed he was after the game I felt sorry **for** him.
129. The group of men were rescued **from** the flood with the help of helicopters.
130. It's freezing. It must be 20° **below** zero.
131. It was called the greatest show **on** earth.
132. The doctor pointed **out** that there might be complications during such an operation.
133. She never cared **about/for** her father. Now she doesn't want to see him anymore.
134. The lawyer accused him **of** stealing all the money.
135. There has been a serious accident involving four cars **on** the motorway.
136. A small child was standing **between** the two adults.
137. His knowledge **of** French was not that good.
138. I won't come to work today. It's may day **off**.
139. The sun rises **in** the east.
140. I'm sorry. I didn't do it **on** purpose.
141. I took her **by** the hand, and we went to the doctor's together.
142. I saw him **at** a football match last Friday.
143. I still think about him **from** time to time.
144. The two trains were moving towards each other **at** a very high speed.
145. **On** average, the British drink three cups of tea every day.
146. For me it was love **at** first sight.

147. I couldn't think of any reason **for** his bad behavior.
148. The government put a new tax **on** alcoholic beverages.
149. We got there **in** time for dinner.
150. The ship ran onto a sand bank a few miles **off** the coast of Norway.
151. I would like to pay **with** my credit card.
152. The boy started school **at** the age of 5.
153. There was a lack **of** clean water in the village.
154. The house is **for** sale, but we don't have the money to buy it.
155. I met him **by** accident. He was looking for a new pair of shoes.
156. I had to pay for the books **in** advance.
157. The doctors said that there was no cure **for** the disease at that time.
158. **In** my opinion, you don't have any options left.
159. They didn't give him anything to drink because he was **under** age.
160. to be excellent **at** something.
161. he is experienced **in** writing emails
162. ashamed **of** having failed
163. concentrate **on** something important
164. an answer **to** the question
165. proud **of** his son
166. famous **for** breath-taking sights
167. supply the customers **with** the right products
168. succeed **in** making a lot of money
169. similar **to** mine
170. respected **for** being an honest politician
171. deal **with** the problem later
172. keen **on** going to the cinema
173. sorry **for** having done something wrong
174. provide her **with** everything she needs
175. responsible **for** employing new workers
176. an expert **on/in** astronomy
177. fond **of** romantic films
178. congratulate him **on** his success
179. interested **in** pursuing a career
180. capable **of** getting to the top
181. to take pride **in** what you do
182. to be short **of** money
183. praise her **for** doing such a good job
184. cooperate **with** the competitor
185. I almost never agree **with** him, but this time we shared the same opinion.

186. He subscribed **to** the weekly magazine.
187. She blamed the incident **on** my carelessness.
188. The convict escaped **from** a high security prison.
189. The young woman smiled **at** me and I smiled back.
190. Students are protesting **against** increasing tuition fees at universities.
191. Small children believe **in** Father Christmas or Santa Claus.
192. After the accident the ambulance took him to the hospital where he fell **into** a coma.
193. Catharine's parents disapproved **of** her marriage to the wealthy banker.
194. Rugby is often associated **with** being a brutal sport.
195. She cares **about** her mother a lot and always comes to visit her.
196. After graduating he applied **for** a job at a local book shop.
197. She insisted **on** taking me out to dinner on my birthday.
198. I always shop **for** my Christmas presents during the summer holidays.
199. After studying at university, she developed **into** a great scientist.
200. He invested all his money **in** real estate.
201. The dog barked **at** the delivery man when he came through the gate.
202. Dad always tries to protect me **from** bad influences.
203. We must sympathize **with** those who have lost relatives in the conflict.
204. The drug addict died **of** an overdose of heroin.
205. In August 1945 the Japanese surrendered **to** the Americans.
206. It took him a long time to recover **from** the accident he had last year.
207. My neighbor complained **about** the noise on the streets.
208. The farmers in the region hoped **for** rain because the drought was destroying all the crops.
209. She gazed **at** me in astonishment.
210. As time went on, the boy changed **into** a man.
211. She works at night and sleeps **during** the day.
212. He is very arrogant and always looks **down** at us.

213. We went **up/down** the stairs to get our gym clothes.
214. She couldn't talk to me because she was **in** a hurry.
215. He was so tired that he slept the whole night **through**.
216. You can't drive over that bridge because it is **under** repair at the moment.
217. We shared the money we received **between** us.
218. She was able to solve the difficult math test **with** ease.
219. She prefers volleyball **to** basketball.
220. You can't leave **without** any money. You'll need some for your ticket.
221. Teachers have gone **on** strike in the past, so this situation is not unusual.
222. It took **over/under** an hour for the technicians to restore electricity to the village.
223. **From** now on you will report to me whenever something happens.
224. He will remain in the office **until** a successor is found.
225. The boy was very clever **for** his age.
226. You must hand in your thesis **by** next week, at the latest.
227. Do you speak any other languages **besides** English?
228. The boy walked **across/through** the field to the house.
229. There's a sign that says, "Keep **off** the grass!"
230. I liked him **at** first, but then he started being bossy and arrogant.
231. **In** conclusion, the report told us to follow the guidelines.
232. We went to the stadium **by** bus.
233. The nurse was **on** duty from 6 in the morning until midnight.
234. **On** your left you can see one of the biggest libraries in the world.
235. When his wife died, he put up the house **for** sale.
236. My sister travelled to the Far East **for** the first time in her life.
237. **In** theory it was a good method, but we did not know if it would work **in** practice.
238. We had to learn all the poems **by** heart.
239. I filled out the wrong application **by** mistake.
240. He's **on** a diet so don't offer him any sweets.

241. **In** any case, the police have to catch the criminal before he causes any more harm.
242. The black Porsche was driving **at** a speed of over 100 m.p.h.
243. After the attack they found themselves **at** war with the enemy.
244. We must try to avoid deaths and casualties **at** all costs.
245. John is **at** university and comes home every two or three months.
246. Why don't you go with your mother **for** a change?
247. She had to travel to New York **on** business.
248. The paintings are **on** loan to the Guggenheim museum.
249. She can't sleep **at** night and always needs to take some pills.
250. **By** all means, we must try to bring all the parties together and work out a solution.
251. The children get **in** trouble all the time.
252. I didn't want to break the vase **on** purpose. It just slipped out of my hand.
253. Do you, **by** chance, have a phone charger with you?
254. Could I have a word with you **in** private?
255. She learned Russian **at** the age of 45.
256. The book was written **by** Mark Twain.
257. I'll show you the picture **of** the palace.
258. We can only get to the camp **on** foot.
259. He reminds me **of** his old history teacher.
260. What are you talking **about**?
261. **By** the end of next year, we will have made over £ 100,000.
262. She always gets up early **in** the morning and goes to bed late **at** night.
263. I went to work **on** Tuesday but I didn't go **on** Friday.
264. You'll have to wait. He'll be with you **in** a minute.
265. Philip waited **for** her at the movie theatre.
266. He started learning English **in** 2005.
267. You have to pay **for** the tickets on the day you order them.
268. We are very proud **of** this company.
269. It's very kind **of** you to help us.
270. The old man suffered **from** a heart attack.
271. Please write **in** pencil.

272. It's **about** time you told him the truth.
273. The manager didn't take part **in** the discussion.
274. He's very good **at** telling jokes.
275. I'll see you **at** the conference
276. We sat down **on** the grass and ate our lunch.
277. My parents got married **in** the 1970s.
278. There's a good restaurant **at** the end of the street.
279. We usually have turkey **for** Thanksgiving.
280. I would like to travel **to** Italy next summer.
281. I took a plane **from** Munich to Rome.
282. I'd like to speak **with** the manager please.
283. I don't usually feel tired **in** the morning.
284. My mother is abroad so my dad is taking care **of** us **at** the moment.
285. Sonja gets **on** the seven o'clock bus in the morning.
286. She always looks **at** herself in the mirror.
287. I met Donna **at** a party **on** Friday night.
288. My friend always borrows money **from** me.
289. Daria's books are lying **on** the floor.
290. He arrived at the school building just **in** time.
291. The audience threw tomatoes **at** him.
292. Passengers are not allowed to use cell phones **on** airplanes.
293. He is responsible **for** what he does.
294. I'm sorry **about** the job you didn't get.
295. I'm very bad **at** mathematics.
296. We had to climb slowly **up** the hill.
297. He is always **on** time.
298. How many people are **on** your team?
299. A university is where you study **for** a degree.
300. Her next birthday will be **on** a Sunday.
301. The new factory is expected to go online **in** May.
302. Many of us eat **with** fork and spoon.
303. We have been searching **for** a web designer for a few weeks now.
304. The TV is **in** the corner of the room.

305. Halloween is celebrated **in** the United States **on** October 31.
306. Are you going away for the weekend? – I don't know. It depends **on** the weather.
307. Don't kiss the prince. He might turn **into** a frog.
308. He felt bad **for** no reason at all.
309. I have been living here **for** ten years.
310. Have you been **to** the cinema recently? Yes, I was there a few days ago.
311. I happened to meet an old friend **in** town.
312. Have you read the article? – It was **in** yesterday's newspapers.
313. He always drives **at** a tremendous speed because he's always **in** a hurry.
314. He is very fond **of** good food.
315. He married **at** the age of 28.
316. I bought many things **during** my stay in New York.
317. According **to** the guide there are three hotels **in** town.
318. I saw him standing **in** the queue but I don't know if he got **on** the bus.
319. I want to post this letter **to** a friend.
320. I'm going **to** Glasgow on Monday.  
Would you like to come with us?
321. John has got a very strange taste **of** clothes.
322. Mum sat **in** the back of the car.
323. I'm interested **in** basketball but I'm not very good **at** playing it.
324. I'm returning **to** Spain **at** the end of the month.
325. My parents met **during** the war, in 1943.
326. Is it true that your mother died **of** cancer?
327. It was embarrassing. I didn't have enough money **to** pay for the meal.
328. It was **on** the radio yesterday morning.
329. It's a quick journey **from** Manchester **to** Leeds.
330. Jane goes to the office early **on** Tuesdays.
331. I saw him sometime **in** June.
332. Meet me **at** the station.
333. The lights are moving **towards** us.
334. My country is famous **for** great musicians.
335. Who is that girl over there **in** the red dress?
336. I live **in** Sweden but every summer I travel **to** Spain for my holidays.
337. Turn right **at** the end of the street and then it will be right in front of you.

338. My sister has a beautiful apartment.  
She lives **on** the third floor.
339. Please sit down. Mr. Brown will be  
**with** you in a moment.
340. I have to apologize **for** being late.
341. She tried to prevent the children  
**from** jumping into the water.
342. Sometimes I have to walk to work  
and sometimes I go **by** bus.
343. Thank you **for** coming to visit us.
344. The boys met **at** the corner of the  
street.
345. The smallest room is located **to** the  
left of the hall.
346. We entered the building **through**  
entrance number 3.
347. There was a dark spot **on** the  
ceiling.
348. We arrived just **in** time to see the  
Queen.
349. We have to be at the airport **by**, **at**  
6 p.m.
350. We ran **across** the doctor on our  
way to the bookshop.
351. The two friends went **to** the movies  
by themselves.
352. During the summer I stayed **with**  
my grandparents.
353. I'll wait for you **at** the bus stop.
354. The milk is **in** the refrigerator next  
to the orange juice.
355. She came and sat **beside** her  
husband.
356. **After** we saw the television show  
on bears we drove to the zoo.
357. **Throughout** the day, the rain came  
into the window.
358. The phone rang **in** the middle of the  
night.
359. Some boys were crawling **around**  
under the car.
360. His notebook fell **on** the floor.
361. The plane flew **above** the clouds.
362. Peter doesn't go to work **on**  
Fridays.
363. Open your book **on** page 9.
364. Can you see a yellow house **on** the  
left?
365. There was a picture **on** the wall  
**above** the bed.
366. All the latest computers will be  
shown **at** the exhibition.
367. He came to see how I was getting  
**on**.
368. I am very interested **in**  
documentaries on TV.
369. I am surprised **at** how much money  
they want to pay him.
370. Nobody in the family has heard  
**about** the accident.
371. She comes **from** a poor family.
372. I am quite good **at** art.

373. Jack came rushing **down** the stairs.
374. Turn right **at** the next traffic lights.
375. Her mother is looking forward **to** going to Australia.
376. The film is based **on** a novel by John Grisham.
377. John is totally obsessed **with** football. He thinks of nothing else.
378. I prefer coffee **to** tea.
379. Let's divide this money **between** us.
380. I like travelling **by** boat in summer.
381. When I was younger I was always afraid **of** going to the dentist.
382. Mary's in the kitchen looking **for** her car keys.
383. Are you really happy **with** your life here?
384. He was quite pleased **with** the results.
385. This is a painting **by** an unknown artist.
386. I am proud **of** being a teacher.
387. Don't worry **about** it. Everything will be fine.
388. My father tells us fascinating stories **about** his years in the navy.
389. Did you call attention **to** their mistake?
390. **According** to the headmaster, both of the boys got involved in the fight.
391. Except **for** that one, all the sentences were easy.
392. Be careful. They will lose faith **in** you.
393. The girls worked **on** their lessons for half an hour.
394. He depends **on** his sister for help.
395. Miss Wilson is very fond **of** French food.
396. There were **over** a thousand people at the concert.
397. You must be **over** 18 in order to see the film.
398. We are travelling **on** the road.
399. He is suffering **from** an unknown illness.
400. I listened to the game **on** the radio.
401. How are you getting **on** at school?
402. Don't be impatient **with** us. We are trying!
403. Could I speak **to** Tom please?
404. We didn't see the whole performance because we left **before** the last act.
405. There were some beautiful pictures **on** the walls.
406. The march started in the park. **From** there we moved to City Hall.
407. Pessimism is bad **for** your health
408. He asked his mother **for** money.

409. I bought many things **during** my stay in New York.
410. My country is famous **for** historical sights.
411. I'm not **in** a hurry. I can wait.
412. Have you ever been **to** the theatre recently?
413. We arrived **at** the airport **in** time for the plane.
414. My grandfather died **of** cancer.
415. The resort lies about 1,500 meters **above** sea level.
416. His hands are **in front of** his face.
417. there's a chair **behind** my desk
418. The thief jumped **out of** the window.
419. Both o my neighbors can take care **of** the cat while you are gone.
420. I rarely think **about** the weather.
421. They were always arguing **about** silly things.
422. **At** first I found the work very tiring but **after** a few weeks I got used to it.
423. My house is **at** the end of the road.
424. The article was **in** yesterday's papers.
425. The classroom is **on** the fourth floor.
426. I applied **for** a few jobs last week, but nobody wrote back.
427. He wants two seats **for** the concert on Friday night.
428. You ought to be ashamed **of** yourself **for** coming in with dirty boots.
429. There's no point **in** going **by** car if we can't park near the theatre.
430. he started his training **in** November
431. Whom did they vote **for**?
432. The bus stopped **at** the corner of High Street and congress Avenue.
433. I love listening **to** classical music.
434. He is **from** Dallas, Texas but he was born in California.
435. She goes **to** church every Sunday.
436. It's 7 a.m. We need to leave **for** work at once or else we'll miss the bus.
437. I asked the policeman **for** some information.
438. The great player hit the ball **over** the net.
439. Can you find our holiday beach **on** the map?
440. Please turn **down** the volume of the radio. I'm getting deaf.
441. We are very excited **about** our trip to Spain next week.
442. I am very fond **of** drinking green tea.
443. Almost all politicians were involved **in** the scandal.

444. I am looking forward **to** having a meeting with you next week.
445. At the moment, she is recovering **from** her injuries.
446. I'm dreaming **about** becoming a famous scientist one day.
447. My cousin is married **to** a famous American.
448. I am responsible **for** training the new recruits.
449. Many people took advantage **of** the low prices offered by the new shop.
450. I was not quite satisfied **with** the exam results.
451. The president was thankful **for** everyone who helped in the campaign.
452. Everyone in this town will benefit **from** the new hospital.
453. For two full days, the man was fighting **for** his life.
454. My dad shouted **at** me because I didn't do what he said.
455. She insisted **on** helping me with the dishes.
456. Almost all car companies care **about** the environment.
457. Wearing a seat belt can protect you **from** being killed in a car.
458. Ten people were killed when a bus collided **with** a car.
459. The customers came to the shop to complain **about** their service.
460. Our atmosphere consists **of** oxygen, nitrogen and carbon dioxide.
461. We decided **against** buying the new car.
462. Many children depend **on** their parents for money.
463. He graduated **from** Oxford university.
464. The advertising campaign resulted **in** hundreds of new customers for the company.
465. As a scientist, I specialize **in** marine biology.
466. A gentleman should be true **to** his words.
467. I beg pardon of you **for** being late.
468. Eventually, I pursued it her to comply **with** my requests.
469. The Village was plunged **into** Darkness due to a sudden power failure.
470. His statement is very much similar **to** mine.
471. Beware **of** backbiters.
472. He has been living in this house **since** 1985.
473. The dog ran **down** the street.
474. Turn the lights **off** before you go **to** bed.

475. He will be cured of this disease **at**  
the earliest.
476. I have no desire **for** fame.
477. The mother was concerned **about**  
the safety of a child.
478. Competitors **around** the globe,  
took part in the game.
479. He took the man **to** hospital.
480. There was a queue of people in the  
rain patiently waiting to get **onto** the  
coach.
481. The minister had promised to look  
**into** the matter.
482. The dwell **among** the wicked is  
bad.
483. His house is adjacent **to** mine.
484. She is suffering **from** fever.
485. The shopkeeper deals **in** household  
goods.
486. The room has been emptying **for**  
several years.
487. Place a ladder **against** the wall.
488. A crime is charged **against** him.
489. He was involved **in** a crime.
490. After an inquiry, he was relieved **of**  
his post.
491. He cannot cope **with** the pressure.
492. We do not go **for** work on Sunday.
493. He is very good **at** making stories.
494. He has been absent **for** a fortnight.
495. He is jealous **of** me.
496. He comes **of** a noble family.
497. Sheila gained an advantage **over**  
me.
498. He held his breath **for** several  
minutes.
499. He has some respite **from**  
suffering.
500. I am sick **of** the whole business.

# Math for Practice

[including Quantitative analysis, Critical reasoning]

## 1. Binary Addition practice.

- $10001 + 11101 = 101110:$

$$\begin{array}{r} & & 1 \\ & 1 & 0 & 0 & 0 & 1 \\ + & 1 & 1 & 1 & 0 & 1 \\ \hline 1 & 0 & 1 & 1 & 1 & 0 \end{array}$$

- $1110 + 1111 = 11101:$

$$\begin{array}{r} & 1 & 1 & 1 \\ & 1 & 1 & 1 & 0 \\ + & 1 & 1 & 1 & 1 \\ \hline 1 & 1 & 1 & 0 & 1 \end{array}$$

- $1011001 + 111010 = 10010011:$

$$\begin{array}{r} & 1 & 1 & 1 & 1 \\ & 1 & 0 & 1 & 1 & 0 & 0 & 1 \\ + & 1 & 1 & 1 & 0 & 1 & 0 \\ \hline 1 & 0 & 0 & 1 & 0 & 0 & 1 & 1 \end{array}$$

- $11011 + 1001010 = 1100101:$

$$\begin{array}{r} & 1 & 1 & 1 \\ & 1 & 1 & 0 & 1 & 1 \\ + & 1 & 0 & 0 & 1 & 0 & 1 & 0 \\ \hline 1 & 1 & 0 & 0 & 1 & 0 & 1 & 1 \end{array}$$

## 2. Number system math practice.

$$(4182)_{10} \rightarrow (?)_8$$

Using Division method, we have-

$$\begin{array}{r} 8 | 4182 \\ \hline 8 | 522 , 6 \\ \hline 8 | 65 , 2 \\ \hline 8 | 8 , 1 \\ \hline 1 , 0 \end{array}$$

From here,  $(4182)_{10} = (10126)_8$

Thus,  $(1056)_{16} = (10126)_8$

$$(1056)_{16} \rightarrow (?)_{10}$$

Using Expansion method, we have-

$$\begin{aligned}(1056)_{16} &= 1 \times 16^3 + 0 \times 16^2 + 5 \times 16^1 + 6 \times 16^0 \\ &= 4096 + 0 + 80 + 6 \\ &= (4182)_{10}\end{aligned}$$

From here,  $(1056)_{16} = (4182)_{10}$

$$(5050)_{10} \rightarrow (?)_{16}$$

Using Division method, we have-

16	5050	
16	315 , 10 = A	
16	19 , 11 = B	
	1 , 3	

From here,  $(5050)_{10} = (13BA)_{16}$

Thus,  $(11672)_8 = (13BA)_{16}$

$$(1001001100)_2 \rightarrow (?)_{10}$$

Using Expansion method, we have-

$$\begin{aligned}(1001001100)_2 &= 1 \times 2^9 + 0 \times 2^8 + 0 \times 2^7 + 1 \times 2^6 + 0 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 0 \times 2^0 \\ &= 512 + 64 + 8 + 4 \\ &= (588)_{10}\end{aligned}$$

From here,  $(1001001100)_2 = (588)_{10}$

**3. Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed?**

Number of ways of selecting (3 consonants out of 7) and (2 vowels out of 4)

$$= ({}^7C_3 \times {}^4C_2)$$

$$= \left( \frac{7 \times 6 \times 5}{3 \times 2 \times 1} \times \frac{4 \times 3}{2 \times 1} \right)$$

$$= 210.$$

Number of groups, each having 3 consonants and 2 vowels = 210.

Each group contains 5 letters.

Number of ways of arranging  
5 letters among themselves = 5!

$$= 5 \times 4 \times 3 \times 2 \times 1$$

$$= 120.$$

∴ Required number of ways =  $(210 \times 120) = 25200$ .

**4. On the circle there are 9 points selected. How many triangles in these points exits?**

Solution:

$$C(3,9) = \binom{9}{3}$$

$$C(3,9) = \frac{9!}{6!3!}$$

$$C(3,9) = \frac{9 \cdot 8 \cdot 7 \cdot 6!}{6!6}$$

$$C(3,9) = \frac{9 \cdot 8 \cdot 7}{6}$$

$$C(3,9) = 84$$

There are 84 such triangles.

**5. Suppose a=2, b=8. Find the arithmetic mean and geometric mean.**

$$AM = (a+b)/2 = (2+8)/2 = 5$$

$$GM = \sqrt{ab} = \sqrt{2*8} = 4$$

**6. Differentiation of ( $e^x$ ) is.....**

**Ans:  $e^x$**

**The derivative of  $e^x$**

We will now prove:

$$\boxed{\frac{d}{dx} e^x = e^x}$$

"The derivative of  $e^x$  with respect to  $x$  is equal to  $e^x$ ."

Since  $y = e^x$  is the inverse of  $y = \ln x$ , we can obtain its derivative as follows:

$$y = e^x$$

$$\text{implies } \ln y = \ln e^x = x.$$

Therefore on taking the derivative of both sides with respect to  $x$ , and applying the chain rule to  $\ln y$ :

$$\frac{1}{y} y' = 1.$$

$$y' = y.$$

That is,

$$\frac{d}{dx} e^x = e^x.$$

$e^x$  is its own derivative.

**7.  $\log(e^x)$  is.....**

We have  $\log e^x$

$$=\log e^x = x \log e \{ \text{as } \log a^b = b \log a \}$$

$$=x \times 1 \{ \text{as } \log e = 1 \}$$

$=x$  is the answer.

**8. Find the next two elements of the following series: 0,1,2,3,5,.....**

**Ans: 8,13**

**9. Standard deviation 1....10?**

**Solution: <http://www.gmatfree.com/module-999/gmat-standard-deviation/>**

## 10. Convert binary number 110001 in decimal

110001 is 49 in decimal form

**Step 1:** Write down the binary number: 110001

**Step 2:** Multiply each digit of the binary number by the corresponding power of two:

$$1 \times 2^5 + 1 \times 2^4 + 0 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$$

**Step 3:** Solve the powers:

$$1 \times 32 + 1 \times 16 + 0 \times 8 + 0 \times 4 + 0 \times 2 + 1 \times 1 = 32 + 16 + 0 + 0 + 0 + 1$$

**Step 4:** Add up the numbers written above:

$$32 + 16 + 0 + 0 + 0 + 1 = 49.$$

So, 49 is the decimal equivalent of the binary number 110001.

## 11. Find subnet mask from the IP address 175.231.232.116/27

Here, n = CIDR = 27

Network bit = 27

$$\begin{aligned} \text{So, Host bit} &= 32 - n \\ &= 32 - 27 \\ &= 5 \end{aligned}$$

So, Subnet Mask = 11111111.11111111.11111111.11100000 = 255.255.255.224

## 12. A man is 24 years older than his son. In two years, his age will be twice the age of his son. What is the present age of his son?

Let present age of the son =  $x$  years

Then, present age the man =  $(x + 24)$  years

Given that, in 2 years, man's age will be twice the age of his son

$$\Rightarrow (x + 24) + 2 = 2(x + 2)$$

$$\Rightarrow x = 22$$

**Ans 22**

**13. Present ages of Kiran and Syam are in the ratio of 5 : 4 respectively. Three years hence, the ratio of their ages will become 11:9 respectively. What is Syam's present age in years?**

Ratio of the present age of Kiran and Syam  
= 5 : 4

Let present age of Kiran =  $5x$   
Present age of Syam =  $4x$

$$\begin{aligned} \text{After 3 years, ratio of their ages} &= 11 : 9 \\ \Rightarrow (5x + 3) : (4x + 3) &= 11 : 9 \\ \Rightarrow 9(5x + 3) &= 11(4x + 3) \\ \Rightarrow 45x + 27 &= 44x + 33 \\ \Rightarrow x &= 33 - 27 = 6 \end{aligned}$$

$$\text{Syam's present age} = 4x = 4 \times 6 = 24$$

**14. The sum of ages of 5 children born at the intervals of 3 years each is 50 years. Find out the age of the youngest child.**

Let the age of the youngest child =  $x$

Then, the ages of 5 children can be written  
as  $x, (x + 3), (x + 6), (x + 9)$  and  $(x + 12)$

$$\begin{aligned} x + (x + 3) + (x + 6) + (x + 9) \\ + (x + 12) &= 50 \\ \Rightarrow 5x + 30 &= 50 \\ \Rightarrow 5x &= 20 \\ \Rightarrow x &= \frac{20}{5} = 4 \end{aligned}$$

**15. At present, the ratio between the ages of Shekhar and Shobha is 4: 3. After 6 years, Shekhar's age will be 26 years. Find out the age of Shobha at present?**

After 6 years, Shekhar's age will be 26 years  
Therefore, Present age of Shekhar  
=  $26 - 6 = 20$

Let present age of Shobha =  $x$

Then,

$$\begin{aligned} \frac{20}{x} &= \frac{4}{3} \\ x &= \frac{20 \times 3}{4} = 15 \end{aligned}$$

**16. The present ages of A,B and C are in proportions 4:7:9. Eight years ago, the sum of their ages was**

**56. What are their present ages (in years)?**

Let present age of A,B and C be  $4x$ ,  $7x$  and  $9x$  respectively.

$$\begin{aligned}(4x - 8) + (7x - 8) + (9x - 8) &= 56 \\ \Rightarrow 20x &= 80 \\ \Rightarrow x &= 4\end{aligned}$$

Hence present age of A, B and C are  
 $4 \times 4$ ,  $7 \times 4$  and  $9 \times 4$  respectively.  
i.e., 16, 28 and 36 respectively.

**17. In the first 10 overs of a cricket game, the run rate was only 3.2. What should be the run rate in the remaining 40 overs to reach the target of 282 runs?**

Runs scored in the first 10 overs =  $10 \times 3.2$  =  
32  
Total runs = 282

Remaining runs to be scored =  $282 - 32 = 250$   
Remaining overs = 40

$$\text{Run rate needed} = \frac{250}{40} = 6.25$$

**18. A train having a length of 240 metre passes a post in 24 seconds. How long will it take to pass a platform having a length of 650 metre?**

$$\text{Speed of the train} = \frac{240}{24} = 10 \text{ m/s}$$

$$\text{Required time} = \frac{240 + 650}{10} = 89 \text{ seconds}$$

**19. cube root of 0.000729 is.....**

$$(0.000729)^{1/3} = 0.09$$

**20. What is the largest 4-digit number exactly divisible by 88?**

Largest 4 digit number = 9999

$9999 \div 88 = 113$ , remainder = 55

Hence largest 4 digit number exactly divisible by 88  
 $= 9999 - 55 = 9944$

**21. How many prime numbers are there less than 50?**

**Ans: 15**

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43,  
47 are the prime numbers less than 50

**22. Today is Monday. After 61 days, it will be.....**

61 days = 8 weeks 5 days = 5 odd days

Hence if today is Monday, After 61 days, it will be = (Monday + 5 odd days)  
= Saturday

**23. Find the mode of the following set of scores.**

**14 11 15 9 11 15 11 7 13 12**

**Solution:**

The mode is 11 because 11 occurred more times than the other numbers.

If the observations are given in the form of a frequency table, the mode is the value that has the highest frequency.

**24. Find the mode of the following set of marks.**

Marks	1	2	3	4	5
Frequency	6	7	7	5	3

**Solution:**

The marks 2 and 3 have the highest frequency. So, the modes are 2 and 3.

**Note:** The above example shows that a set of observations may have more than one mode.

**25. The following frequency table shows the marks obtained by students in a quiz. Given that 4 is the mode, what is the least value for x?**

Marks	1	2	3	4	5	6
Number of students (Frequency)	7	9	10	x	9	11

**Solution:**

x is at least 12

(if x is less than 12 then 4 will not be the mode)

**26. Find the median of the following set of points in a game:**

**15, 14, 10, 8, 12, 8, 16**

**Solution:**

First arrange the point values in an ascending order (or descending order).

8, 8, 10, 12, 14, 15, 16

The number of point values is 7, an odd number. Hence, the median is the value in the middle position.

8, 8, 10, 12, 14, 15, 16

↑  
Middle position

Median = 12

When the number of observations is odd, the median is the middle value.

**27. Find the median of the following set of points:**

**15, 14, 10, 8, 12, 8, 16, 13**

**Solution:**

First arrange the point values in an ascending order (or descending order).

8, 8, 10, 12, 13, 14, 15, 16

The number of point values is 8, an even number. Hence the median is the average (mean) of the 2 middle values.

8, 8, 10, 12, 13, 14, 15, 16

$\underbrace{\phantom{00}}_{\text{Average of two middle values}}$

$$\text{Median} = \frac{12+13}{2} = 12.5$$

When the number of observations is even, the median is the average of the two middle values.

**28. x is the median for 4, 3, 8, x and 7. Find the possible values for x.**

Solution:

Arrange the numbers in ascending order with x in the middle 3, 4, x, 7, 8

This tells us that the possible values of x are 4, 5, 6 and 7.

**29. The set of scores 12, 5, 7, -8, x, 10 has a mean of 5. Find the value of x.**

**Solution:**

$$\begin{aligned}\text{Mean} &= \frac{12+5+7+(-8)+x+10}{6} = 5 \\ \Rightarrow 26+x &= 30 \\ \Rightarrow x &= 4\end{aligned}$$

**30. 10 students of a class had a mean score of 70. The remaining 15 students of the class had mean score of 80. What is the mean score of the entire class?**

**Solution:**

Total score of first 10 students =  $10 \times 70 = 700$

Total score of remaining 15 students =  $15 \times 80 = 1200$

Mean score of whole class

$$= \frac{700+1200}{25} = 76$$

**31. A coin is thrown 3 times. what is the probability that at least one head is obtained?**

Sample space = [HHH, HHT, HTH, THH, TTH, THT, HTT, TTT]

Total number of ways =  $2 \times 2 \times 2 = 8$ . Fav. Cases = 7

P (of getting at least one head) =  $1 - P(\text{no head}) \Rightarrow 1 - (1/8) = 7/8$

**32. What is the probability of getting a sum of 7 when two dice are thrown?**

Total number of ways =  $6 \times 6 = 36$  ways.

Favorable cases = (1, 6) (6, 1) (2, 5) (5, 2) (3, 4) (4, 3) --- 6 ways.

P (A) =  $6/36 = 1/6$

**33. Three dice are rolled together. What is the probability as getting at least one '4'?**

Total number of ways =  $6 \times 6 \times 6 = 216$ .

Probability of getting number '4' at least one time =  $1 - (\text{Probability of getting no number 4})$

$$= 1 - (5/6) \times (5/6) \times (5/6) = 91/216$$

**34. Find the probability of getting two heads when five coins are tossed.**

Number of ways of getting two heads =  ${}^5C_2 = 10$ .

Total Number of ways =  $2^5 = 32$

$$P(\text{two heads}) = 10/32 = 5/16$$

**35. A die is rolled, find the probability that an even number is obtained.**

Let us first write the sample space S of the experiment.

$$S = \{1, 2, 3, 4, 5, 6\}$$

Let E be the event "an even number is obtained" and write it down.

$$E = \{2, 4, 6\}$$

We now use the formula of the classical probability.

$$P(E) = n(E) / n(S) = 3 / 6 = 1 / 2$$

**36. Which of these numbers cannot be a probability?**

- a) -0.00001
- b) 0.5
- c) 1.001
- d) 0
- e) 1
- f) 20%

Solution

A probability is always greater than or equal to 0 and less than or equal to 1, hence only a) and c) above cannot represent probabilities: -0.00010 is less than 0 and 1.001 is greater than 1.

**37. A card is drawn at random from a deck of cards. Find the probability of getting a queen.**

Let E be the event "getting a Queen".

An examination of the sample space shows that there are 4 "Queens" so that  $n(E) = 4$  and  $n(S) = 52$ .

Hence the probability of event E occurring is given by

$$P(E) = 4 / 52 = 1 / 13$$

**38. A jar contains 3 red marbles, 7 green marbles and 10 white marbles. If a marble is drawn from the jar at random, what is the probability that this marble is white?**

color	frequency
red	3
green	7
white	10
total	= $3+7+10=20$

$P(E) = \text{Frequency for white color} / \text{Total frequencies in the above table}$

**39. Student in a math class where 40% are males and 60% are females took a test. 50% of the males and 70% of the females passed the test. What percent of students passed the test?**

Let events E1 "be a male" and E2 "be a female", and event A "passed the test".

$$P(A)=P(A|E1)P(E1)+P(A|E2)P(E2)$$

$$=50\% \times 40\% + 70\% \times 60\% = 62\%$$

**40. 5% of a population have a flu and the remaining 95% do not have this flu. A test is used to detect the flu and this test is positive in 95% of people with a flu and is also (falsely) positive in 1% of the people with no flu. If a person from this population is randomly selected and tested, what is the probability that the test is positive?**

Solution

Use the total probability theorem to find the percentage as follows:

$$5\% \times 95\% + 95\% \times 1\% = 5.7\%$$

**41. A card is drawn from a pack of 52 cards. What is the probability of getting a queen of club or a king of heart**

First, we will find the number of favorable outcomes and total outcomes. The total number of cards in the pack is 52. Therefore, the total number of possible outcomes when a card is picked from the pack is 52. Next, we will find the number of favorable outcomes. There are 4 queens (1 each of clubs, spades, diamonds, hearts) in a pack. Thus, there is only 1 queen of clubs in a pack of 52 cards. Similarly, there are 4 kings (1 each of clubs, spades, diamonds, hearts) in a pack. Thus, there is only 1 king of hearts in a pack of 52 cards. We need the probability of getting either a king of hearts, or a queen of clubs when 1 card is drawn from a pack of 52 cards. Therefore, the number of favorable outcomes is 2. Finally, we will use the formula for probability of an event to calculate the probability of getting a card of diamond. Let E be the event of getting a queen of clubs or a king of hearts. Substituting 2 for the number of favorable outcomes, and 52 for the number of total outcomes in the formula, we get

$$\Rightarrow P(E) = 2/52 = 1/26$$

**42. Which number should be come next in this series: 10, 17, 26, 37? Ans: 50**

**43. If  $xy = 2$  and  $y^2 = 8$ , what is the value of x? Ans:  $1/\sqrt{2}$**

**44. If n and k are positive integers and  $8n=2k$ . What is the value of n/k? Ans: 1/4**

**45. The decimal number -34 is expressed in 2's complement form as? Ans: 11011110**

**46. If a sweater sells for \$48 after a 25% markdown, what was its original price?**

$$(100-25) = 75\% = 75/100 = 0.75$$

$$0.75 \times x = 48$$

$$x = \$64 \text{ Ans:}$$

**47. What percent of 50 is 0.15? Ans: 0.3**

**48. If the side of a square is increased by a 20% then area increased by.....**

Let side of square = 100 cms.

Then Area =  $100 \times 100 = 10000$  sq.cms.

Now after increase in side by 20 %. Area of Square =  $120 \times 120 = 14400$  sq.cms.

Increase in Area =  $14400 - 10000 = 4400$  sq.cms.

Percentage change in area =  $(4400/10000) \times 100 = 44\%$

**49. The product of two numbers is 120 and the sum of their squares is 289. The sums of the number is?**

Ans: 23

**50. A certain password must contain 3 distinct digits followed by 2 distinct capital letters. Given ten digits and 26 capital letters, how many different passwords are possible?**

List the number of possible options for each character in the password. There are 10 possibilities for the first digit, 9 left for the second, and 8 left for the third. There are 26 possibilities for the first letter and 25 for the second. There are:

$$10 \times 9 \times 8 \times 26 \times 25 = 468,000 \text{ possible passwords.}$$

**51. If the average of 5 numbers is 36 and the average of four of those numbers is 34, then what is the value of the fifth number?**

The average of 5 numbers is 36 --> the sum of 5 numbers is  $5 \times 36 = 180$ ;

The average of 4 numbers is 34 --> the sum of 4 numbers is  $4 \times 34 = 136$ .

The difference = the omitted number =  $180 - 136 = 44$ .

**52. If two painters can complete two rooms in two hours, how many painters would it take to do 18 rooms in 6 hours?**

2 painter takes 2 hours to Paint 2 rooms means, 1 painter takes 2 hours to paint 1 room.

So in 6 hours 1 painter can paint 3 rooms.

So to paint 18 rooms in 6 hours 6 painters are needed.

**53. The difference between the squares of two consecutive numbers is 37. Find the numbers.... .....**

If the difference between the squares of two consecutive numbers is  $x$ ,

then the numbers are  $(x-1)/2$  and  $(x+1)/2$

So it's,  $(37-1)/2$  and  $(37+1)/2$

$= 36/2$  and  $38/2$

Answer: 18 and 19

**54. In a certain store, the profit is 320% of the cost. If the cost increases by 25% but the selling price remains constant, approximately what percentage of the selling price is the profit?**

Let C.P.= Rs. 100. Then, Profit = Rs. 320, S.P. = Rs. 420

New C.P. = 125% of Rs. 100 = Rs. 125

New S.P. = Rs. 420

Profit = Rs. (420 - 125) = Rs. 295

∴ Required percentage

$$= \left( \frac{295}{420} \times 100 \right) \%$$

$$= \frac{1475}{21} \%$$

= 70% (approximately)

**55. If  $m$  and  $n$  are whole numbers such that  $m^n = 121$ , the value of  $(m - 1)^{n+1}$  is:**

We know that  $11^2 = 121$ .

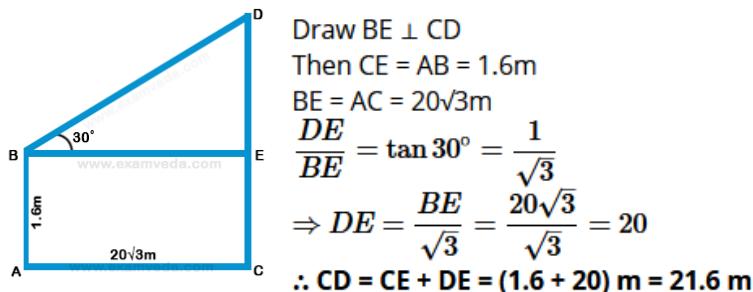
Putting  $m = 11$  and  $n = 2$ , we get:

$$(m - 1)^{n+1} = (11 - 1)^{2+1} = 10^3 = 1000.$$

**56. Sachin borrows Rs. 5000 for 2 years at 4% p.a. simple interest. He immediately lends money to Rahul at 25/4% p.a. for 2 years. Find the gain of one year by Sachin.**

$$\begin{aligned} \text{Gain in 2 year} &= \\ [(5000 \times \frac{25}{4} \times \frac{2}{100}) - (\frac{5000 \times 4 \times 2}{100})] &= \\ &= (625 - 400) = 225 \\ \text{So gain for 1 year} &= \\ \frac{225}{2} &= 112.50 \end{aligned}$$

- 57. An observer 1.6 m tall is  $20\sqrt{3}$  away from a tower. The angle of elevation from his eye to the top of the tower is  $30^\circ$ . The heights of the tower is:**



- 58. A train 100 m long passes a bridge at the rate of 72 km/h in 25 s. The length of the bridge is**

Let the length be  $x$  m.

$$\text{Then, } (x + 100) = 72 \times 25 \times \frac{5}{18} = 500$$

$$\therefore x = 500 - 100 = 400 \text{ m}$$

- 59. The perimeter of a rectangle is 26 cm. If its length is 3 cm more than its breadth, find the dimensions of the rectangle.**

Let breadth be  $x$  cm.

Length =  $x+3$  cm

Perimeter of rectangle = 26 cm

$$2(l+b) = 26$$

$$x+3+x=13$$

$$2x=10$$

$$x=5$$

Therefore,

Breadth = 5 cm

Length = 8 cm

**60. Mia has a large bag of sweets.If she shares the sweets equally among 2,3,4,5 or 6 people there will always be 1 sweet left over.What is the smallest number of sweets there could be in the bag?**

Mia has a large bag of sweets. If she shares the sweets equally among 2,3,4,5 or 6 people. First find the LCM that will give us the least number of sweets distributed equally among 2,3,4,5 or 6 people.

$$\begin{aligned}2 &= 2 \\3 &= 3 \\4 &= 2 \times 2 \\5 &= 5 \\6 &= 2 \times 3\end{aligned}$$

$$\text{LCM} = 2 \times 2 \times 3 \times 5 = 60.$$

That means if she has 60 sweets, she can share them equally among 2,3,4,5 or 6 people.

Now we want to be 1 sweet left over.

So add 1 and 60.

$$60+1=61.$$

**61. A boy was asked to multiply a certain number by 25 He multiplied it by 52 and got his answer more by 324 than the correct answer The number to be multiplied was?**

Let the number is  $x$

The if be multiply by 25 then correct answer =  $25x$

But boy multiply with 52 then boys answer =  $52x$

As per question boy answer if more than 324 than correct answer

$$\therefore 52x = 25x + 324$$

$$\Rightarrow 52x - 25x = 324$$

$$\Rightarrow 27x = 324$$

$$\Rightarrow x = 12$$

**62. A two-digit number is such that the product of its digits is 8.When 18 is added to the number, the digits are reversed. The number is:**

Let the ten's and unit digit be  $x$  and  $\frac{8}{x}$  respectively

Then,

$$\left(10x + \frac{8}{x}\right) + 18 = 10 \times \frac{8}{x} + x$$

$$\Rightarrow 10x^2 + 8 + 18x = 80 + x^2$$

$$\Rightarrow 9x^2 + 18x - 72 = 0$$

$$\Rightarrow x^2 + 2x - 8 = 0$$

$$\Rightarrow (x + 4)(x - 2) = 0$$

$$\Rightarrow x = 2$$

$\therefore$  first digit will be 2 and second digit will be 4.

i.e digit is 24.

63. Reena took a loan of Rs. 1200 with simple interest for as many years as the rate of interest. If she paid Rs. 432 as interest at the end of the loan period, what was the rate of interest?

Let rate = R% and time = R years

$$\text{Then, } \left( \frac{1200 \times R \times R}{100} \right) = 432$$

$$12R^2 = 432$$

$$R^2 = 36$$

$$R = 6$$

64. A bag contains 6 black and 8 white balls. One ball is drawn at random. What is the probability that the ball drawn is white?

Let number of balls =  $(6 + 8) = 14$

Number of white balls = 8.

$$P(\text{drawing a white ball}) = \frac{8}{14} = \frac{4}{7}$$

65. Find the probability that a number selected from the numbers 1 to 25 is not a prime number when each of the given numbers is equally likely to be selected.

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25

Prime Numbers = 2, 3, 5, 7, 11, 13, 17, 19, 23

$$\text{Let } x \text{ be the event of getting prime numbers } P(x) = \frac{9}{25}$$

$$\text{Therefore the probability of getting non-prime number} = 1 - \frac{9}{25} = \frac{16}{25}$$

66. A box contains 3 red, 3 white and 3 green balls. A ball is selected at random. Find the probability that the ball picked up is neither a white nor a red ball:

Total number of outcomes = 9

Favourable outcomes (the ball is neither white nor red) = 3

$$\text{Probability} = \frac{3}{9} = \frac{1}{3}$$

**67. A letter is chosen at random from the letters of the English alphabet. The probability that it is not a vowel is?**

There are 26 letters of which 21 are consonants. Therefore

$$P(\text{not a vowel}) = 21/26$$

**68. What is the probability of selecting 'W' from the letters of the word SWORD?**

The W comes in 1 time in SWORD and there are total 5 letters

$$\text{Hence Probability is } P(E) = \frac{1}{5}$$

**69. If the letters of the word RANDOM be arranged at random, the probability that there are exactly 2 letters in between A and O is**

No. of ways of putting 2 letters between A and O and then arranging the letters

$$= {}^4 C_2 * 2! * 2! * 3! = 144$$

(the first 2! is for A and O, the second 2! is for the letters between A and O, 3! is for the three things to be arranged, i.e. O,A and the 2 letters form a group followed by 2 other letters outside)

$$\text{Probability} = \frac{144}{6!} = \frac{1}{5}$$

**70. If  $\tan\theta = \cot\theta$ , then the value of  $\sec\theta$  is :**

$$\tan\theta = \cot\theta$$

$$\Rightarrow \tan^2\theta = 1$$

$$\Rightarrow \tan\theta = 1$$

$$\Rightarrow \theta = 45^\circ$$

$$\therefore \sec 45^\circ = \sqrt{2}$$

④ Evaluate,  $\int (\sin x + \cos x) dx$

Solution:

$$\begin{aligned} & \int (\sin x) dx + \int (\cos x) dx \\ &= -\cos x + \sin x + C \quad [\text{Ans:}] \end{aligned}$$

④ Evaluate,  $\int \frac{1 - \sin x}{\cos^2 x} dx$

Solution:

$$\begin{aligned} & \int \left( \frac{1}{\cos^2 x} - \frac{\sin x}{\cos^2 x} \right) dx \\ &= \int \left( \sec^2 x - \left( \frac{\sin x}{\cos x} \cdot \frac{1}{\cos x} \right) \right) dx \\ &= \int (\sec^2 x - \tan x \sec x) dx \\ &= \tan x - \sec x + C \quad [\text{Ans:}] \end{aligned}$$

④ Evaluate  $\int_1^2 \frac{1}{x} \ln x dx$

Solution:

$$\begin{aligned} & \text{Let, } \ln x = y \\ & \Rightarrow \frac{1}{x} = \frac{dy}{dx} \\ & \Rightarrow \frac{1}{x} dx = dy \end{aligned}$$

$$\begin{aligned} & \therefore \int_1^2 y dy \\ &= \left[ \frac{y^2}{2} \right]_1^2 \\ &= \frac{1}{2} [\ln 2^2 - \ln 1^2] \\ &= \frac{1}{2} [\ln(2^2) - 0] \\ &= \frac{1}{2} \ln(2^2) \quad [\text{Ans:}] \end{aligned}$$

Not Sure!

④ If  $y = e^x \log x$  find  $\frac{dy}{dx}$  at  $x=1$

Solution:  $y = e^x \log x$

$$\frac{dy}{dx} = e^x \frac{d}{dx}(\log x) + \log x \left( \frac{d}{dx} e^x \right)$$

$$\frac{dy}{dx} = e^x \frac{1}{x} + \log x e^x$$

$$= e^x \left( \frac{1}{x} + \log x \right)$$

$$\begin{aligned} \lim_{x \rightarrow 1} &= e^1 (1 + \log 1) \quad \text{Not Sure!} \\ &= e^1 (1+0) \\ &= e^1 \quad [\text{Ans:}] \end{aligned}$$

④ Find the value of  $x$  from  $\log_x 81 = -4$

Solution:

$$\begin{aligned} \log_x 81 = -4 &\Rightarrow x^{-4} = 81 \\ &\Rightarrow \frac{1}{x^4} = 3^4 \\ &\Rightarrow \frac{1}{x} = 3 \\ &\therefore x = \frac{1}{3} \quad [\text{Ans:}] \end{aligned}$$

④  $\int_0^{\sqrt{x}} 2 \ln(e^x) dx = ?$

Solution:

$$\begin{aligned} & \left[ 2 \frac{1}{e^x} e^x x^2 \right]_0^{\sqrt{x}} \quad \text{[This math} \\ &= [x^2]_0^{\sqrt{x}} \quad \text{Solved by Rupay} \\ &= (\sqrt{x})^2 - 0^2 \quad \text{Rupam]} \\ &= x \quad [\text{Ans:}] \end{aligned}$$

④ If  $x^{\sqrt{x}} = (\sqrt{x})^x$  then  $x = ?$

Solution:

$$\begin{aligned} x^{\sqrt{x}} &= (\sqrt{x})^x \\ \Rightarrow (x^x)^{\sqrt{x}} &= (x^{x/2})^x \\ \Rightarrow (x^x)^{\sqrt{x}} &= (x^{1+1/2})^x \\ \Rightarrow (x^x)^{\sqrt{x}} &= (x^{3/2})^x \\ \Rightarrow (x^x)^{\sqrt{x}} &= (x^x)^{3/2} \\ \Rightarrow \sqrt{x} &= 3/2 \\ \Rightarrow x &= 9/4 \quad [\text{Ans:}] \end{aligned}$$

④ If  $\log_{\sqrt{8}} x = 10/3$  then  $x = ?$

$$\begin{aligned} \text{Solution: } x &= (\sqrt{8})^{10/3} = (\sqrt{2^3})^{10/3} \\ &= (2^{3/2})^{10/3} \\ &= 2^5 = 32 \quad [\text{Ans:}] \end{aligned}$$

④  $1 + 2 + 3 + \dots + 99 = ?$  [Ans: 4950]

Solution:

Here,  $a = 1, d = 2 - 1 = 1, P = 99$

$$\therefore a + (n-1)d = P$$

$$\Rightarrow 1 + (n-1)1 = 99$$

$$\Rightarrow n = 99$$

$$\begin{aligned} S_n &= \frac{n}{2} \{2a + (n-1)d\} \\ &= \frac{99}{2} (2+98) \\ &= \frac{9900}{2} = 4950 \quad [\text{Ans:}] \end{aligned}$$

④  $-\sqrt[3]{27} = ?$

Solution:

$$\begin{aligned} -\sqrt[3]{(3)^3} &= -3^{3/3} \\ &= -3 \quad [\text{Ans:}] \end{aligned}$$

④ If each side of a square increases 10%, then area will be increased by?

Solution: Let, each side =  $x$

$$\therefore \text{area} = x^2$$

$$\begin{aligned} 10\% \text{ increase} &= x + x \times 10\% \\ &= 1.10x \end{aligned}$$

$$\begin{aligned} \text{area after increasing} &= (1.10x)^2 \\ &= 1.21x^2 \end{aligned}$$

$$\therefore \text{Area increment} = (1.21x^2 - x^2) = 0.21x^2$$

$$\therefore 21\% \quad [\text{Ans:}]$$

④ What is the sum of 1 to 50?

$$\begin{aligned} \text{Solution: } S_{50} &= \frac{50(50+1)}{2} \\ &= 1275 \quad [\text{Ans:}] \end{aligned}$$

④  $3 \log_{10} 2 + \log_{10} 5 = ?$

Solution:

$$\begin{aligned} 3 \log_{10} 2 + \log_{10} 5 &= \log_{10} 2^3 + \log_{10} 5 \\ &= \log_{10} 8 + \log_{10} 5 \\ &= \log_{10} (8 \times 5) \\ &= \log_{10} 40 \quad [\text{Ans:}] \end{aligned}$$

④ If  $x:y = 3:4$  and  $y:z = 6:7$  then,  $x:y:z = ?$

Solution:

$$4 \text{ and } 6 \text{ --- } = 12$$

$$\therefore 3:4 = 3/4 = \frac{3 \times 3}{4 \times 3} = \frac{9}{12}$$

$$6:7 = 6/7 = \frac{6 \times 2}{7 \times 2} = \frac{12}{14}$$

$$\therefore x:y:z = 9:12:14$$

⊕ If  $\log_{10} x = -2$  then  $x = ?$

Solution:

$$\log_{10} x = -2$$

$$x = 10^{-2}$$

$$= \frac{1}{10^2}$$

$$= \frac{1}{100} = 0.01 \quad [\text{Ans:}]$$

⊕  $\log_x 324 = 4$ ,  $x = ?$

Solution:

$$\log_x 324 = 4$$

$$\Rightarrow x^4 = 324$$

$$\Rightarrow x^4 = 3^4 \times (\sqrt{2})^4$$

$$\Rightarrow x^4 = (3\sqrt{2})^4$$

$$\therefore x = 3\sqrt{2} \quad [\text{Ans:}]$$

⊕  $\log_{10} 100 = ?$

Solution

$$\log_{10} 10^2$$

$$= 2 \log_{10} 10 \quad [\log_a a = 1]$$

$$= 2 \cdot 1 = 2 \quad [\text{Ans:}]$$

⊕  $\log_{\sqrt{3}} 81 = ?$

Solution:

$$\log_{\sqrt{3}} 3^4$$

$$= \log_{\sqrt{3}} \{(\sqrt{3})^2\}^4$$

$$= 8 \log_{\sqrt{3}} \sqrt{3}$$

$$= 8 \cdot 1$$

$$= 8 \quad [\text{Ans:}]$$

⊕  $(-3)^3 \times (-\frac{1}{2})^2 = ?$

Solution:

$$(-3)(-3)(-3) \left(-\frac{1}{2}\right)\left(-\frac{1}{2}\right)$$

$$= (-27)\left(\frac{1}{4}\right)$$

$$= -\frac{27}{4}$$

⊕ If  $4^{x+1} = 32$  then  $x = ?$

Solution:

$$4^{x+1} = 32$$

$$\Rightarrow (2^2)^{x+1} = 2^5$$

$$\Rightarrow 2^{2x+2} = 2^5$$

$$\Rightarrow 2x+2 = 5$$

$$\therefore x = \frac{3}{2} \quad [\text{Ans:}]$$

⊕ Ismi ~~solve~~ solves some math problem in 10 days. Nafisa require 5 more days to solve those problem. If they work together how many days required to be solved those problems.

Solution:

Ismi = 10 days, Nafisa =  $10 + 5 = 15$  days

in 1 day Ismi solves  $\frac{1}{10}$

" " Nafisa "  $\frac{1}{15}$

Both in 1 day  $\left(\frac{1}{10} + \frac{1}{15}\right)$

$$= \frac{3+2}{30}$$

$$= \frac{1}{6}$$

$\frac{1}{6}$  in 1 days (Both)

$$1 \text{ (full)} " 1 \div \frac{1}{6} = 6 \text{ days} \quad [\text{Ans:}]$$

④ If  $a = \sqrt{3} + \sqrt{2}$  then  $a^3 + \frac{1}{a^3} = ?$

Solution:

$$\begin{aligned}\frac{1}{a} &= \frac{1}{\sqrt{3} + \sqrt{2}} = \frac{(\sqrt{3} - \sqrt{2})}{(\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2})} \\ &= \frac{\sqrt{3} - \sqrt{2}}{(\sqrt{3})^2 - (\sqrt{2})^2} \\ &= \sqrt{3} - \sqrt{2}\end{aligned}$$

$$\therefore a + \frac{1}{a} = 2\sqrt{3}$$

$$\begin{aligned}\therefore a^3 + \frac{1}{a^3} &= (a + \frac{1}{a})^3 - 3a \cdot \frac{1}{a}(a + \frac{1}{a}) \\ &= (2\sqrt{3})^3 - 3(2\sqrt{3}) \\ &= 2^3(\sqrt{3})^3 - 3(2\sqrt{3}) \\ &= 8 \cdot 3\sqrt{3} - 6\sqrt{3} \\ &= 24\sqrt{3} - 6\sqrt{3} \\ &= 18\sqrt{3} \quad [\text{Ans}] \end{aligned}$$

④ If  $(2x+y, z) = (6, x-y)$  then  $(x, y) = ?$

Solution:

$$\begin{aligned}\text{Here, } 2x+y &= 6 \quad \dots \text{ (i)} \\ x-y &= 3 \quad \dots \text{ (ii)}\end{aligned}$$

$$3x = 9$$

$$x = 3$$

$$\text{From (i)} \Rightarrow 6+y=6$$

$$y=0$$

$$\therefore (x, y) = (3, 0) \quad [\text{Ans.}]$$

④ If  $g(x) = x^3 + ax^2 - 3x - 6$  then for which value of  $a$ ,  $g(-2) = 0$ ?

$$\begin{aligned}\text{Solution: } g(-2) &= (-2)^3 + a(-2)^2 - 3(-2) - 6 \\ &= 4a - 8 \\ \therefore 4a - 8 &= 0 \quad [\text{since } g(-2) = 0] \\ a &= 2 \quad [\text{Ans.}] \end{aligned}$$

④ Two cars started from same point, at 5 a.m. travelling in opposite directions at 100 and 50 mph respectively. At what time will they be 450 miles apart?

Solution:

Let, time taken =  $x$  hours

$$100x + 50x = 450 \text{ m}$$

$$150x = 450 \text{ m}$$

$$\therefore x = 3 \text{ hours}$$

Now, 5 a.m.

$$\therefore 5 + 3 = 8 \text{ a.m. (Ans.)}$$

④  $f$  and  $g$  are functions defined by,

$$f(x) = 2x+2 \text{ and } g(x) = (x+3)^2 \text{ find } f(g(2))$$

Solution:

$$g(x) = (x+3)^2$$

$$g(2) = (2+3)^2 = 5^2 = 25$$

$$f(g(2)) = f(25)$$

$$f(x) = 2x+2$$

$$f(25) = 2 \cdot 25 + 2$$

$$= 50 + 2 = 52 \quad [\text{Ans.}]$$

④ In a group of cows and hens, the number of legs are 14 more than twice the number of heads. How many cows are there?

Solution:

Let,

$$\begin{aligned} \text{cows} &\rightarrow x \quad [\text{legs 4 and head 1}] \\ \text{hens} &\rightarrow y \quad [\text{legs 2 " " 1}] \end{aligned}$$

$$\text{Total legs} \rightarrow 4x + 2y$$

$$\text{Total heads} \rightarrow x + y$$

$$\therefore 4x + 2y = 2(x+y) + 14$$

$$\Rightarrow 4x - 2x = 2y - 2y + 14$$

$$\Rightarrow 2x = 14$$

$$\therefore x = 7 \quad (\text{Ans:})$$

④ How many subsets does the set  $\{a, b, c, d, e\}$  have?

Solution:

number of element in  $\{a, b, c, d, e\} = 5$

$\therefore 2^5 = 32$  subsets [Ans:]

④ A men's regular pay is \$3 per hour upto 40 hours. Overtime is twice the payment of regular time. If he was paid \$168 how many hours overtime did he work?

Solution: Regular pay =  $3 \times 40 = 120 \$$

Extra earned =  $168 - 120 = 48 \$$

Overtime payment per hour  $2 \times 3 = 6 \$$

$\therefore$  Overtime =  $48 / 6 = 8$  hours (Ans:)

④ If  $3^m = 81$  then  $m^3 = ?$

Solution:

$$3^m = 81$$

$$\Rightarrow 3^m = 3^4$$

$$\therefore m = 4 \quad \therefore m^3 = 4^3 = 64 \quad (\text{Ans:})$$

④ At school, the ratio of female to male is  $5 : 8$ . If there are 83 more males than females, how many females are there?

Solution:

$$F : M = 5 : 8$$

$$\text{difference} = 8 - 5 = 3$$

$$\begin{aligned} 3 &\longrightarrow 63 \\ 1 &\longrightarrow \frac{63}{3} \\ 50 &\longrightarrow \frac{63 \times 50}{3} \\ &= 105 \quad (\text{Ans:}) \end{aligned}$$

④ 5 men paint 2 houses in 3 days.

10 men paint 8 houses in \_\_\_\_\_?

Solution:

5 men 2 houses  $\longrightarrow$  3 days

$$1 \text{ " } 1 \text{ " } \longrightarrow \frac{3 \times 5}{2} \text{ "}$$

$$10 \text{ " } 8 \text{ " } \longrightarrow \frac{3 \times 5 \times 8}{2 \times 10} \text{ "}$$

$$= 6 \text{ days (Ans)}$$

④ Sum of two numbers is 48 and smaller one is equal to one fifth of larger number, what are the numbers?

Solution: Let, Larger =  $x$   
Smaller =  $x/5$

$$\therefore x + x/5 = 48$$

$$\Rightarrow \frac{5x+x}{5} = 48 \Rightarrow x = \frac{48 \times 5}{6} = 40$$

$$\therefore \text{Smaller} = 40/5 = 8$$

$$\therefore 40 \text{ and } 8 \quad (\text{Ans})$$

④ If  $x/y = 10$  and  $x-y = 18$  then  $y = ?$

Solution:

Hence,

$$\frac{x}{y} = 10 \Rightarrow x = 10y$$

and,

$$x-y = 18$$

$$\Rightarrow 10y-y = 18$$

$$\Rightarrow 9y = 18$$

$$\therefore y = 2 \text{ (Ans.)}$$

⑤  $B12_{16} + 5CA_{16} = ?$

Solution:

$$\begin{array}{r} B12 \\ 5CA \\ \hline 107C \\ 16 \end{array} \quad \left( \begin{array}{l} B+5=16 \\ 16|16|11 \\ \hline 0 \end{array} \right)$$

⑥ The probability that an electronic device produced by a company does not function properly is equal to 0.1 if 10 devices are bought, then the probability to the nearest thousandth that 7 device function properly is \_\_\_\_?

Solution:

$$\text{Probability of not functioning} = 0.1$$

$$\therefore \text{Probability of functioning} = 1 - 0.1$$

$$= 0.9$$

hence,  $n = 7$

$$\begin{aligned} \therefore P(e) &= n C_n (0.9)^8 (0.1)^3 && \left[ \text{Solved by Rupoy Rupom} \right] \\ &= 10 C_7 (0.4782) (0.001) && \left[ \text{Rupom} \right] \\ &= \frac{10!}{(10-7)! 7!} \times (0.0004782) \\ &= 0.057 \end{aligned}$$

(Ans.)

⑦ It takes 6 men to complete a task at a construction site in 15 days. Authority need to complete it earlier and employed 9 men of the same caliber. How many days they can save to complete the task?

Solution:

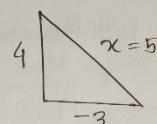
$$\begin{array}{r} 6 \dots 15 \text{ days} \\ 1 \dots (15 \times 6)^{\frac{1}{4}} \\ 6+9 = 15 \dots \frac{15 \times 6}{15} = 6 \end{array} \quad \text{("Ans.)}$$

⑧ There is a room with 8 doors. If you can enter and exit the room through any door, how many ways you can enter and exit the room? Remember you cannot use the same door to both.

$$\text{Solution: } n P_R = {}^8 P_2 = \frac{8!}{(8-2)!} = 40,320 \quad (\text{Ans.})$$

⑨ If  $x$  is an angle in standard position with point  $(-3, 4)$  on the terminal side, then  $\sec(x) = ?$

Solution:



$$\begin{aligned} \therefore x &= \sqrt{4^2 + (-3)^2} \\ &= \sqrt{16+9} \\ &= \sqrt{25} \\ &= 5 \end{aligned}$$

[This math solved by Rupoy Rupom]

$$\therefore \sec(x) = \frac{5}{-3} \quad \left[ \sec = \frac{\text{adj}}{\text{opp}} \right]$$

⑩ The lines  $2x+4y=7$  and  $4x-y=3$  are perpendicular.

④ If the first term of an arithmetic Progression is 6 and 11<sup>th</sup> term is 76 what is the 5<sup>th</sup> term?

Solution:

$$\text{n}^{\text{th}} \text{ term} = a + (n-1)d$$

$$1^{\text{st}} \text{ term} \Rightarrow a + (1-1)d = 6$$

$$\Rightarrow a = 6$$

$$11^{\text{th}} \text{ term} \Rightarrow a + (11-1)d = 76$$

$$\Rightarrow 10d = 76 - 6$$

$$\Rightarrow d = 7$$

$$\therefore 5^{\text{th}} \text{ term} \Rightarrow a + (5-1)d =$$

$$\Rightarrow 6 + 4 \cdot 7$$

$$\Rightarrow 34 \text{ (Ans.)}$$

[This math  
is solved by  
Rupoy Rupom]

④ If  $-4 \leq a \leq 9$  and  $-3 \leq b \leq 2$  then what is the greatest possible value of  $a-b$ ?

Solution:

Largest value of  $a = 9$

Lowest value of  $b = -3$

$$\therefore a-b = 9+3 = 12 \text{ (Ans.)}$$

④ A contractor completed five-ninths of a job before a second contractor completed an additional one-third. What fraction of the job left undone?

Solution:

$$\begin{aligned} \text{Both contractors done} &= \frac{5}{9} + \frac{1}{3} \\ &= \frac{5+3}{9} = \frac{8}{9} \end{aligned}$$

$$\therefore \text{Left} = 1 - \frac{8}{9} = \frac{1}{9} \text{ (Ans.)}$$

④ The vertex of the graph of  $y = 2x^2 + 8x - 3$  is given by \_\_\_\_\_.

Solution:

$$x \text{ vertex} = \frac{-b}{2a} = \frac{-8}{2 \cdot 2} = \frac{-8}{4} = -2$$

$$y \text{ vertex} = -\frac{b^2 - 4ac}{4a} = -\frac{8^2 - 4 \cdot 2 \cdot (-3)}{4 \cdot 2}$$

$$\begin{aligned} [\text{This math solved by}] &= -\frac{64+24}{8} \\ &\text{Rupoy Rupom} \\ &= -11 \end{aligned}$$

$$\therefore (-2, -11) \text{ (Ans.)}$$

④ The three solutions of the equation  $f(x)=0$  are  $-4, 8$ , and  $11$ . Therefore the three solution of the equation  $f(2x)=0$  are ?

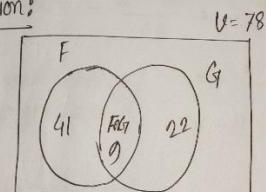
Solution:  $f(x) = f(2x) = 0$

$$\Rightarrow -4, 8, 11 = 2x$$

$$\Rightarrow x = -2, 4, 2/11 \text{ (Ans.)}$$

④ In a class of 78 students 41 are taking French, 22 are taking German. Of the students taking French or German 9 are taking both courses. How many students are not enrolled in either course?

Solution:



$$\therefore n(U) = n(F) + n(G) - n(F \cap G) + (F \cup G)'$$

$$\Rightarrow 78 = 41 + 22 - 9 + (F \cup G)'$$

$$\Rightarrow 78 - 54 = (F \cup G)' \quad [\text{This}$$

$$\Rightarrow (F \cup G)' = 24 \quad \begin{aligned} &\text{Math solved by} \\ &\text{Rupoy Rupom} \end{aligned}$$

④ Find the value of  $x$  from  $\log_x 81 = -4$

Solution:

$$\log_x 81 = -4$$

$$\Rightarrow x^{-4} = 81$$

$$\Rightarrow x^{-4} = 3^4$$

$$\Rightarrow \frac{1}{x^4} = 3^4$$

$$\Rightarrow x^4 = \frac{1}{3^4}$$

$$\Rightarrow (x)^4 = (\frac{1}{3})^4$$

$$\Rightarrow x = \frac{1}{3} \text{ (Ans.)}$$

④ The sum of ages of 5 children born at the intervals of 3 years each is 50 years. What is the age of the youngest child?

Solution: Let youngest child age =  $x$

$$\text{Then, } x + (x+3) + (x+6) + (x+9) + (x+12) = 50$$

$$\Rightarrow 5x + 30 = 50$$

$$\therefore x = 4 \text{ (Ans.)}$$

④ 2's complement of 1000 is \_\_\_\_\_ ?

Solution:

1000

0111 is complement

+ 1

1000 2's complement

Ans: 1000

④ A hockey team won 6 games and lost 8 what is the percentage of win?

Solution: Total =  $6+8=14$  games

14 - - - 6 games

1 - - -  $\frac{6}{14} \%$

100 - - -  $\frac{6}{14} \times \frac{1}{100} = \frac{3}{7} \% \text{ (Ans.)}$

④ 7 workers can build 7 cars in 7 days. then how many days would it take 5 workers to build 5 cars?

Solution:

7 workers - - 7 cars - - 7 days

1 " - - 7 " - -  $(7 \times 7)$ "

5 " - - 7 " - -  $\frac{7 \times 7}{5}$ "

5 " - - 1 " - -  $\frac{7 \times 7}{5}$ "

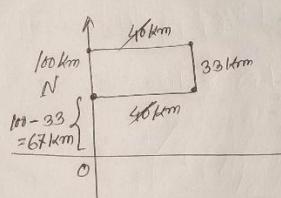
5 " - - 5 " - -  $\frac{7 \times 7}{5}$ "

$$\frac{7 \times 7 \times 5}{7 \times 5}$$

$$= 7 \text{ days (Ans)}$$

④ A cyclist goes 100 km to north then turning to east he goes 40 km. Again he turns to his right and goes 33 km. After this he turns to his right and goes 40 km. How far is he from his starting point?

Solution:



$$100 \text{ km} - 33 \text{ km} = 67 \text{ km}$$

(Ans)

⊗  $xy = c$  is the equation of hyperbola

⊗ If a coin is tossed twice, Find the Probability of tossing a head and then a head again.

Solution:

Possible outcomes are :

(HH) (HT) (TH) (TT)

So, two head is possible only once

So, Probability is  $\frac{1}{4}$  (Ans.)

Alternative:

1st toss probability of Head is  $\frac{1}{2}$   
And " " " " " "  $\frac{1}{2}$   
 $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$  (Ans.)

⊗ If the integer  $a$  is even and  $b$  is odd then  $(a+b)^2$  = Even true / False ?

Ans: True. [Square of anything is even]

⊗ The area under a curve is determined by \_\_\_\_\_

⊗ Divide 30 by half and add ten. What do you get?

Solution:

$$\begin{aligned} \text{Hence, } & (30 \div \frac{1}{2}) + 10 \\ & = (30 \times 2) + 10 \\ & = 70 \text{ (Ans.)} \end{aligned}$$

$$\begin{array}{r} 30 \text{ (Divide by } 2 \text{ gives } 15) \\ 15 \text{ (Divide by } 2 \text{ gives } 7 \text{ remainder } 1) \\ 7 \text{ (Divide by } 2 \text{ gives } 3 \text{ remainder } 1) \\ 3 \text{ (Divide by } 2 \text{ gives } 1 \text{ remainder } 1) \\ 1 \text{ (Divide by } 2 \text{ gives } 0 \text{ remainder } 1) \end{array}$$

⊗ The total age of Tanisha and Nafisa is 10. If Tanisha is 2 years older than Nafisa and Monisha is 2 years younger than Nafisa, then the age of Monisha is ?

Solution:

Hence,

$$\text{Tanisha} + \text{Nafisa} = 10$$

$$\Rightarrow (\text{Nafisa} + 2) + \text{Nafisa} = 10 \quad [\text{Since Tanisha is } 2 \text{ years older}]$$

$$\Rightarrow 2 \cdot \text{Nafisa} = 10 - 2$$

$$\Rightarrow \text{Nafisa} = \frac{8}{2} = 4$$

$$\therefore \text{Age of Monisha is } (4 - 2) = 2 \text{ years} \quad (\text{Ans})$$

⊗ What will be the next two numbers in the following Series?

4, 10, 5, 12, 6, 14, - - - , - - -

Solution:

$$\begin{array}{ccccccc} 4 & & 10 & & 5 & & 12 \\ \swarrow & & \searrow & & \swarrow & & \searrow \\ 6 & & 7 & & 8 & & 9 \end{array}$$

Ans: 7 and 16

⊗ If  $A = \{2, 3, 4\}$ , what is the cardinality of set  $A$  ?

Solution:

Cardinality of set  $A = 3$

[Since  $A$  contains 3 elements]

④ The sum of two numbers is 26 and product is 165  
What are those numbers?

Solution:

Let, numbers two are  $x$  and  $y$   
 $\therefore x+y = 26$  and  $xy = 165$

$$\begin{aligned}\therefore x-y &= \sqrt{(x+y)^2 - 4xy} \\ &= \sqrt{676 - 660} \\ &= \sqrt{16} \\ &= 4 \quad \text{numbers are } 15 \text{ and } 11\end{aligned}$$

$$x+y = 26 \quad (\text{Ans})$$

$$x-y = 4$$

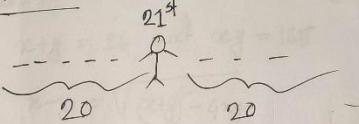
$$2x = 30$$

$$\therefore x = 15 \quad \therefore y = 26 - 15 = 11$$

④ Suppose you are standing in a queue where your position is 21 from either end of the queue.

How many people are standing in the queue?

Solution:



$$\therefore 20 + 1 + 20 = 41 \quad (\text{Ans:})$$

$$④ 20 \% \text{ of } 2 = ?$$

Solution:

$$\begin{aligned}20 \% \text{ of } 2 &= \frac{20}{100} \times 2 \\ &= \frac{2}{5} = 0.4 \quad (\text{Ans:})\end{aligned}$$

④ What percentage of 36 is 27?

Solution:

$$\begin{aligned}\frac{27}{36} \times 100 \% \\ = \frac{3}{4} \times 100 \% \\ = 75 \% \quad (\text{Ans})\end{aligned}$$

④ The population of Sawai town increased from 4000 to 6000 find the percentage of increasing.

Solution:

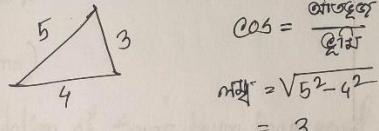
$$\begin{aligned}4000 - \dots (6000 - 4000) &= 2000 \\ 1 - \dots - \dots &= \frac{2000}{4000} \\ 100 - \dots - \dots &= \frac{2000 \times 100}{4000} \\ &= 50 \% \quad (\text{Ans:})\end{aligned}$$

$$④ -6 \div (-3) = ?$$

$$\text{Solution: } \frac{-6}{-3} = 2 \quad (\text{Ans:})$$

④ If  $\cos \theta = 4/5$ , then  $\tan \theta = ?$

Solution:



$$\cos = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\text{adj} = \sqrt{5^2 - 4^2} \\ = 3$$

$$\tan = \frac{\text{opposite}}{\text{adj}} \\ = \frac{3}{4} \quad (\text{Ans:})$$

④ Taking each of the digit 4, 3, 0, 1 only once, how many numbers of four digit can be formed?

$$\text{Solution: } 4! = 4 \times 3 \times 2 \times 1 = 24 \quad (\text{Ans:})$$

④ If 11 persons meet at a reunion and each person shakes hands exactly once with each other. What is the total number of handshakes?

Solution:

$$\binom{11}{2}$$

$$= 10 + 9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1$$

$$= 55 \text{ (Ans.)}$$

$$\text{Or, } \frac{n(n-1)}{2} = \frac{11 \times 10}{2} = \frac{110}{2} = 55 \text{ (Ans.)}$$

④ A hockey team won 6 games lost 8 games what is the percentage of win?

Solution:

$$\text{Win} = 6 \text{ games}$$

$$\text{Lost} = 8 \text{ games}$$

$$\text{total matches/games} = 6 + 8 = 14$$

$$\therefore \text{Win percentage is } = \frac{6}{14} \times 100\% \\ = 42.85\%$$

④ Find the next three in the sequence.

$$1, 1, 2, 4, 7, 13, 24, ?, ?, ?$$

Solution:

$$1, 1, 2, 4, 7, 13, 24, \underbrace{44, 81, 149}_{\text{Ans}}$$

Hint: from fourth digit every digit is the sum of last three digits

④ A coin is tossed three times. Find the probability of getting at least two heads.

Ans:

Sample events

(HHH)	1
(HHT)	2
(HTH)	3
(THH)	4
TTT	5
TT H	6
T(H H)	7
H T T	8

$$\therefore P(E) = \frac{4}{8} \\ = \frac{1}{2} \text{ Ans.}$$

④ When you multiply a number by 4 and then subtract 7, the result is the same as if you first subtracted 7 from the same number and multiplied by 11. Then what is the number?

Ans:

Lets assume, the number is  $x$

So,

$$4x - 7 = (x - 7) \times 11$$

$$\Rightarrow 4x - 7 = 11x - 77$$

$$\Rightarrow 11x - 4x = 77 - 7$$

$$\Rightarrow 7x = 70$$

$$\therefore x = 10 \text{ (Ans.)}$$

④ A mobile phone can be purchased for 5000/- cash or on credit with a 2000/- down plus payments of 700/- per month for five months. How much would be saved by paying cash?

Solution:

Mobile phone actual price = 5000/- (on cash)

$$\text{Otherwise} = 2000 + (700 \times 5)$$

$$= 2000 + 3500 \\ = 5500/-$$

$$\therefore \text{Money can be saved } 5500 - 5000 \\ = 500/-$$

④ If  $f(x) = 2x+6$  and  $g(x) = 3x-5$

$$\text{then } \frac{f(2)}{g(3)} = ?$$

Solution:

$$f(x) = 2x+6 \\ f(2) = 2 \cdot 2 + 6 \\ = 12$$

$$g(x) = 3x-5 \\ = 3 \cdot 3 - 5 \\ = 4$$

$$\therefore \frac{f(x)}{g(x)} = \frac{12}{4} = 3 \text{ (Ans.)}$$

④ How many different five letters arrangements are there of the letters in the word MANGO

Solution:

$$5! \\ = 5 \times 4 \times 3 \times 2 \times 1 \\ = 120 \text{ (Ans.)}$$

④ What are the prime factors of 36?

Solution:

$$36 = 1 \times 36 \\ = 2 \times 18 \\ = 3 \times 12 \\ = 4 \times 9 \\ = 6 \times 6$$

Hence, except 2 and 3 all are divisible.

So, prime factors are 2 and 3 (Ans.)

④ How many unique numbers can be formed using 7 bits?

Solution:

$$2^7 = 128 \text{ unique numbers. (Ans.)}$$

④ Mr. Karim earns  $x$  taka in 3 months and expends the same amount in 4 months. How much he saves in one year?

Solution:

$$\begin{array}{ccccccc} \text{In } 3 \text{ months he earns } & x \text{ taka} \\ \text{In } 1 & " & " & " & \frac{x}{3} \text{ taka} \\ \text{In } 12 & " & " & " & \frac{x \times 12}{3} \text{ taka} & = 4x \text{ taka} \end{array}$$

Again,

$$\begin{array}{ccccccc} \text{In } 4 \text{ months he } & \cancel{\text{earns}} & \text{expends } x \text{ taka} \\ \text{In } 1 & " & " & " & \frac{x}{4} \text{ taka} \\ \text{In } 12 & " & " & " & \frac{x \times 12}{4} \text{ taka} & = 3x \text{ taka} \end{array}$$

$\therefore$  He saves  $4x - 3x = x$  taka in a year.

Ans:  $x$  taka.

④ Jamal and Jahid went into business together. Jamal contributed Tk. 10,000 and Jahid contributed Tk. 6,000.

After 1 year the business made a profit of 4,000 taka.

What is the amount of the profit that should Jahid take if they are shared in the same ratio as their original contributions?

Solution:

Jaamals contribution  $\rightarrow$  10,000 Tk.

Jahids "  $\rightarrow$  6,000 "

Total contribution  $(10,000 + 6,000) = 16,000$  Tk.

in 16,000 the profit is 4,000 Tk.

$$\text{Profit per unit} = \frac{4,000}{16,000} = \frac{1}{4}$$

$$\text{Jahid's share} = \frac{1}{4} \times 6,000 = 1,500 \text{ Tk.}$$

④ Evaluate  $\lim_{x \rightarrow 0} \frac{e^x - e^{-x}}{x}$

Solution:

$$\lim_{x \rightarrow 0} \frac{e^x - e^{-x}}{x}$$

$$= \lim_{x \rightarrow 0} \left( 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots \right) - \left( 1 - \frac{x}{1!} + \frac{x^2}{2!} - \frac{x^3}{3!} + \dots \right)$$

$$= \lim_{x \rightarrow 0} \frac{(1+x+\frac{x^2}{2!}+\frac{x^3}{3!}+\dots)-(1-x+\frac{x^2}{2!}-\frac{x^3}{3!}+\dots)}{x}$$

$$= \lim_{x \rightarrow 0} \frac{\cancel{(2x+\frac{2x^3}{3!}+\dots)}}{x}$$

$$= \lim_{x \rightarrow 0} \frac{2x(1+\frac{x^2}{3!}+\dots)}{x}$$

$$= \lim_{x \rightarrow 0} 2 \left( 1 + \frac{x^2}{3!} + \dots \right)$$

$$= 2 \times 1$$

$$= 2 \quad [\text{Ans:}]$$

④ Evaluate  $\lim_{x \rightarrow a} \frac{\sqrt{x+a} - \sqrt{2a}}{x-a}$

Solution:

$$\lim_{x \rightarrow a} \frac{\sqrt{x+a} - \sqrt{2a}}{x-a}$$

$$= \lim_{x \rightarrow a} \frac{(\sqrt{x+a} - \sqrt{2a})(\sqrt{x+a} + \sqrt{2a})}{(x-a)(\sqrt{x+a} + \sqrt{2a})}$$

$$= \lim_{x \rightarrow a} \frac{(\sqrt{x+a})^2 - (\sqrt{2a})^2}{(x-a)(\sqrt{x+a} + \sqrt{2a})}$$

$$= \lim_{x \rightarrow a} \frac{(x-a)}{(x-a)(\sqrt{x+a} + \sqrt{2a})}$$

$$= \lim_{x \rightarrow a} \frac{1}{\sqrt{x+a} + \sqrt{2a}}$$

$$= \frac{1}{\sqrt{2a} + \sqrt{2a}}$$

$$= \frac{1}{2\sqrt{2a}} \quad [\text{Ans:}]$$



## Written Part

10 marks

# PMSCS



Red Color Questions are Most important

Mustakim Billah Bedar

### 1. What is Normalization? Why we do that? What are the types of normalization?

Normalization is a database design technique that reduces data redundancy and eliminates undesirable characteristics like Insertion, Update and Deletion Anomalies. Normalization rules divides larger tables into smaller tables and links them using relationships. The purpose of Normalization in SQL is to eliminate redundant (repetitive) data and ensure data is stored logically.

**Types:** 1NF (First Normal Form), 2NF (Second Normal Form), 3NF (Third Normal Form), BCNF (Boyce-Codd Normal Form)

#### 1NF (First Normal Form) Rules

- Each table cell should contain a single value.
- Each record needs to be unique.

#### 2NF (Second Normal Form) Rules

- Rule 1- Be in 1NF
- Rule 2- Single Column Primary Key that does not functionally dependent on any subset of candidate key relation

#### 3NF (Third Normal Form) Rules

- Rule 1- Be in 2NF
- Rule 2- Has no transitive functional dependencies

#### Boyce Codd normal form (BCNF)

- A table is in BCNF if every functional dependency  $X \rightarrow Y$ , X is the super key of the table.
- For BCNF, the table should be in 3NF, and for every FD, LHS is super key.

## **2. What is parity check?**

Parity check is a method for detecting errors in data communications or within a computer system by counting the number of ones or zeros per byte or per word, including a special check bit (parity bit), to see if the value is even or odd.

## **3. What are the functions of CDROM?**

A CD-ROM drive (Compact Disk – Read Only Memory) is a type of device used by your computer to read CDs. These CDs are used for a variety of purposes such as installing software and playing music. A CD-ROM drive operates by using a laser to reflect light off the bottom of the CD or disc. The reflected light pulses are read by a photo detector. These incoming pulses are decoded by the microprocessor and then sent as usable data to the rest of the computer where it is processed and used.

CD-ROM drives can open documents on data CDs, such as music files, pictures, word documents and other files. However, CD-ROM drives cannot write information to a CD (burn) because they are read-only drives; writing information to a CD is done with a CD-R drive.

## **4. Discuss Optical Fibre, Twisted Pair and Coaxial Cable.**

### **Optical fibre:**

Optical fibre is a transmitting device that's transmits signals in the form of light. Optical fibre is made up of glass or plastic. It is very thin above 2 to 125  $\mu\text{m}$ . It belongs to a cylindrical shape containing three sections:

- Core: The innermost section
- Cladding: The middle section
- Jacket: The outer section

### **Twisted Pair:**

Twisted pair is the most widely used and least expensive guided medium. It consists of two conductors (copper) that is twisted together with its own plastic insulation. One of the wire is used to carry signal to the receiver and the other one is used for ground reference only. The receiver uses the difference among them. There are two types of twisted pair cable.

- Unshielded Twisted Pair (UTP)
- Shielded Twisted Pair (STP)

### **Coaxial Cable:**

Coaxial Cable has better shielding than twisted pairs, so it can span longer distances at higher speeds. A Coaxial cable is consist of a stiff copper wire as the core, surrounding by an insulating material. The construction and shielding of the coaxial cable give it a good combination of high bandwidth and excellent immunity. Coaxial cable is widely used for cable television and Metropolitan Area Network.

## 5. What do you mean by redundancy?

Redundancy means having multiple copies of same data in the database. This problem arises when a database is not normalized. Problems caused due to redundancy are: Insertion anomaly, Deletion anomaly, and Updation anomaly.

## 6. What is distributed processing?

Distributed processing is the organization of processing to be carried out on a distributed system. Each process is free to process local data and make local decisions. The processes exchange information with each other over a data communication network to process data or to read decisions that affect multiple processes. In a distributed processing system the various cooperating processes that jointly make up the total activity may run on separate processing systems linked only by communications channels. In an open distributed system, the components are physically separated and are linked by communications channels that use open systems standards for their interfaces and protocols, and the intercommunication between the processes is again in accordance with a (different) set of open systems standards. It is clear that there is still a long way to go before open distributed processing will be a commercial reality.

## 7. What is point to point connection?

In telecommunications, a point-to-point connection refers to a communications connection between two communication endpoints or nodes. An example is a telephone call, in which one telephone is connected with one other, and what is said by one caller can only be heard by the other. This is contrasted with a point-to-multipoint or broadcast connection, in which many nodes can receive information transmitted by one node. Other examples of point-to-point communications links are leased lines and microwave radio relay.

## 8. What do you know about Shannon's Capacity?

Claude Shannon extended Nyquist's work for actual channels that are subject to noise. Noise can be of various types like thermal noise, impulse noise, cross-talks etc. Among all the noise types, thermal noise is unavoidable. The random movement of electrons in the channel creates an extraneous signal not present in the original signal, called the thermal noise. The amount of thermal noise is calculated as the ratio of the signal power to noise power, SNR.

Shannon's Capacity gives the theoretical maximum data rate or capacity of a noisy channel. It is expressed as:

Capacity = Bandwidth  $\times \log_2(1 + \text{SNR})$  [Here, Capacity is the maximum data rate of the channel in bps, Bandwidth is the bandwidth of the channel, SNR is the signal – to – noise ratio]

For example, if the bandwidth of a noisy channel is 4 KHz, and the signal to noise ratio is 100, then the maximum bit rate can be computed as:

$$\text{Capacity} = 4000 \times \log_2(1 + 100) = 26,633 \text{ bps} = 26.63 \text{ kbps}$$

## 9. What is Nyquist bit rate formula?

Nyquist bit rate was developed by Henry Nyquist who proved that the transmission capacity of even a perfect channel with no noise has a maximum limit.

The theoretical formula for the maximum bit rate is:

$$\text{maximum bit rate} = 2 \times \text{Bandwidth} \times \log_2 V$$

Here, maximum bit rate is calculated in bps. Bandwidth is the bandwidth of the channel. V is the number of discrete levels in the signal

For example, if there is a noiseless channel with a bandwidth of 4 KHz that is transmitting a signal with 4 discrete levels, then the maximum bit rate will be computed as, maximum bit rate =  $2 \times 4000 \times \log_2 4 = 16,000$  bps = 16 kbps

## 10. What are the types of errors?

**There are three types of error: logic, run-time and compile-time error:**

**Logic errors** occur when programs operate incorrectly but do not terminate normally (or crash). Unexpected or undesired outputs or other behavior may result from a logic error, even if it is not immediately recognized as such. Logic errors occur when executed code does not produce the expected result. Logic errors are best handled by meticulous program debugging.

**A run-time error** is an error that takes place during the execution of a program and usually happens because of adverse system parameters or invalid input data. The lack of sufficient memory to run an application or a memory conflict with another program and logical error is an example of this.

**Compile-time errors** rise at compile-time, before the execution of the program. Syntax error or missing file reference that prevents the program from successfully compiling is an example of this.

### Classification of Compile-time error

Lexical: This includes misspellings of identifiers, keywords or operators

Syntactical: a missing semicolon or unbalanced parenthesis

Semantical: incompatible value assignment or type mismatches between operator and operand

Logical: code not reachable, infinite loop.

### **11. Define cyclic redundancy check (CRC).**

The cyclic redundancy check (CRC) is a technique used to detect errors in digital data. As a type of checksum, the CRC produces a fixed-length data set based on the build of a file or larger data set. In terms of its use, CRC is a hash function that detects accidental changes to raw computer data commonly used in digital telecommunications networks and storage devices such as hard disk drives. In the cyclic redundancy check, a fixed number of check bits, often called a checksum, are appended to the message that needs to be transmitted. The data receivers receive the data, and inspect the check bits for any errors.

### **12. What is hamming code?**

Hamming code is a set of error-correction codes that can be used to detect and correct the errors that can occur when the data is moved or stored from the sender to the receiver. Redundant bits are extra binary bits that are generated and added to the information-carrying bits of data transfer to ensure that no bits were lost during the data transfer.

The number of redundant bits can be calculated using the following formula:

$$2^r \geq m + r + 1$$

where, r = redundant bit, m = data bit

### **13. What is Firewall?**

A firewall is a division between a private network and an outer network, often the internet, that manages traffic passing between the two networks. It's implemented through either hardware or software. Firewalls allow, limit, and block network traffic based on preconfigured rules in the hardware or software, analyzing data packets that request entry to the network. In addition to limiting access to computers and networks, a firewall is also useful for allowing remote access to a private network through secure authentication certificates and logins.

### **14. What is Repeater?**

Repeaters are network devices operating at physical layer of the OSI model that amplify or regenerate an incoming signal before retransmitting it. They are incorporated in networks to expand its coverage area. They are also known as signal boosters.

When an electrical signal is transmitted via a channel, it gets attenuated depending upon the nature of the channel or the technology. This poses a limitation upon the length of the LAN or coverage area of cellular networks. This problem is alleviated by installing repeaters at certain intervals. Repeaters amplifies the attenuated signal and then retransmits it. Digital repeaters can even reconstruct signals distorted by transmission loss. So, repeaters are popularly incorporated to connect between two LANs thus forming a large single LAN.

### **15. What is domain name system (DNS)?**

The domain name system (DNS) is a naming database in which internet domain names are located and translated into Internet Protocol (IP) addresses. The domain name system maps the name people use to locate a website to the IP address that a computer uses to locate that website. For example, if someone types "example.com" into a web browser, a server behind the scenes maps that name to the corresponding IP address. An IP address is similar in structure to 203.0.113.72. DNS servers convert URLs and domain names into IP addresses that computers can understand and use. They translate what a user types into a browser into something the machine can use to find a webpage. This process of translation and lookup is called DNS resolution.

### **16. What is TELNET**

TELNET stands for TErminal NETwork. It is a type of protocol that enables one computer to connect to local computer. It is used as a standard TCP/IP protocol for virtual terminal service which is given by ISO. Computer which starts connection known as the local computer. Computer which is being connected to i.e. which accepts the connection known as remote computer. When the connection is established between local and remote computer. During telnet operation whatever that is being performed on the remote computer will be displayed by local computer. Telnet operates on client/server principle. Local computer uses telnet client program and the remote computers uses telnet server program.

### **17. What is MANET?**

MANET Stands for "Mobile Ad Hoc Network." A MANET is a type of ad hoc network that can change locations and configure itself on the fly. Because MANETS are mobile, they use wireless connections to connect to various networks. This can be a standard Wi-Fi connection, or another medium, such as a cellular or satellite transmission.

### **18. Describe the three levels of data abstraction?**

There are mainly three levels of data abstraction:

- Internal Level: Actual PHYSICAL storage structure and access paths.
- Conceptual or Logical Level: Structure and constraints for the entire database
- External or View level: Describes various user views

### **19. What is Functional Dependency?**

A functional dependency is a constraint that specifies the relationship between two sets of attributes where one set can accurately determine the value of other sets. It is denoted as  $X \rightarrow Y$ , where X is a set of attributes that is capable of determining the value of Y. The attribute set on the left side of the arrow, X is called Determinant, while on the right side, Y is called the Dependent. Functional dependencies are used to mathematically express relations among database entities and are very important to understand advanced concepts in Relational Database System.

## 20. What is Program counter?

Program counter holds the address of either the first byte of the next instruction to be fetched for execution or the address of the next byte of a multi byte instruction, which has not been completely fetched. In both the cases it gets incremented automatically one by one as the instruction bytes get fetched. Also Program register keeps the address of the next instruction.

## 21. What is Stack Pointer?

Stack pointer is a special purpose 16-bit register in the Microprocessor, which holds the address of the top of the stack.

## 22. Which interrupt has the highest priority?

TRAP has the highest priority

## 23. What is SIM and RIM instructions?

SIM is Set Interrupt Mask. Used to mask the hardware interrupts.

RIM is Read Interrupt Mask. Used to check whether the interrupt is Masked or not.

## 24. What are the flags in 8086?

Carry flag, Parity flag, Auxiliary carry flag, Zero flag, Overflow flag, Trace flag, Interrupt flag, Direction flag, and Sign flag.

## 25. Briefly Describe ER Diagram.

ER Diagram stands for Entity Relationship Diagram, also known as ERD is a diagram that displays the relationship of entity sets stored in a database. In other words, ER diagrams help to explain the logical structure of databases. ER diagrams are created based on three basic concepts: entities, attributes and relationships.

ER Diagrams contain different symbols that use rectangles to represent entities, ovals to define attributes and diamond shapes to represent relationships.

At first look, an ER diagram looks very similar to the flowchart. However, ER Diagram includes many specialized symbols, and its meanings make this model unique. The purpose of ER Diagram is to represent the entity framework infrastructure.

## 26. What are the prerequisites for Binary search?

- The elements should be sorted.
- The middle element should be accessible.

## 27. Describe briefly ROM, PROM, EPROM, EEPROM.

### ROM

ROM stands for Read-only Memory. It is a type of memory that does not lose its contents when the power is turned off. For this reason, ROM is also called non-volatile memory.

### PROM (programmable ROM)

PROM refers to the kind of ROM that the user can burn information into. In other words, PROM is a user-programmable memory. Programming ROM also called burning ROM, requires special equipment called a ROM burner or ROM programmer. EPROM was invented to allow making changes in the contents of PROM after it is burned. For every bit of the PROM, there exists a fuse. PROM is programmed by blowing the fuses. If the information burned into PROM is wrong, that PROM must be discarded since its internal fuses are blown permanently. For this reason, PROM is also referred to as OTP (One Time Programmable).

### EPROM (erasable programmable ROM)

In EPROM, one can program the memory chip and erase it thousands of times. This is especially necessary during the development of the prototype of a microprocessor-based project. A widely used EPROM is called UV-EPROM, where UV stands for ultraviolet. The only problem with UV-EPROM is that erasing its contents can take up to 20 minutes. All UV-EPROM chips have a window through which the programmer can shine ultraviolet (UV) radiation to erase the chip's contents. For this reason, EPROM is also referred to as UV-erasable EPROM or simply UV-EPROM.

### EEPROM (electrically erasable programmable ROM)

EEPROM has several advantages over EPROM, such as the fact that its method of erasure is electrical and therefore instant as opposed to the 20-minute erasure time required for UV-EPROM.

In addition, in EEPROM one can select which byte to be erased, in contrast to UV-EPROM, in which the entire contents of ROM are erased. However, the main advantage of EEPROM is that one can program and erase its contents while it is still in the system board. It does not require the physical removal of the memory chip from its socket. In other words, unlike UV-EPROM, EEPROM does not require an external erasure and programming device.

## 28. What do you know about BCD?

Binary Coded Decimal, or BCD, is another process for converting decimal numbers into their binary equivalents. It is a form of binary encoding where each digit in a decimal number is represented in the form of bits. This encoding can be done in either 4-bit or 8-bit (usually 4-bit is preferred). It is a fast and efficient system that converts the decimal numbers into binary numbers as compared to the existing binary system. These are generally used in digital displays where the manipulation of data is quite a task. Thus BCD plays an important role here because the manipulation is done treating each digit as a separate single sub-circuit.

### **29. What are the various registers in 8085?**

Accumulator register, Temporary register, Instruction register, Stack Pointer, Program Counter

### **30. What is enum?**

Enumeration (or enum) is a user defined data type in C. It is mainly used to assign names to integral constants, the names make a program easy to read and maintain.

### **31. What do you understand by Encapsulation?**

Encapsulation is one of the fundamentals of OOP (object-oriented programming). It refers to the bundling of data with the methods that operate on that data. Encapsulation is used to hide the values or state of a structured data object inside a class, preventing unauthorized parties' direct access to them. Publicly accessible methods are generally provided in the class (so-called getters and setters) to access the values, and other client classes call these methods to retrieve and modify the values within the object.

### **32. What do you know about OOPS concept?**

Object Oriented programming (OOP) is a programming paradigm that relies on the concept of classes and objects. It is used to structure a software program into simple, reusable pieces of code blueprints (usually called classes), which are used to create individual instances of objects. There are many object-oriented programming languages including JavaScript, C++, Java, and Python.

### **33. What is Malware?**

Malware, or malicious software, is any program or file that is intentionally harmful to a computer, network or server.

Types of malwares include computer viruses, worms, Trojan horses, ransomware and spyware. These malicious programs steal, encrypt and delete sensitive data; alter or hijack core computing functions and monitor end users' computer activity.

### **34. What is Polymorphism?**

Polymorphism is the ability of an object to take on many forms. The most common use of polymorphism in OOP occurs when a parent class reference is used to refer to a child class object.

### **35. What do you know about POST?**

Short for power-on self-test, the POST is a test the computer must complete verifying all hardware is working properly before starting the remainder of the boot process. The POST process checks computer hardware, like RAM (random access memory), hard drive, CD-ROM drive, keyboard, etc., to make sure all are working correctly.

If all hardware passes the POST, the computer continues the boot up process and may generate a single beep sound as well. If POST is unsuccessful, it generates a beep code to indicate the error encountered and the computer will not boot up. All POST errors are relating to hardware issues with one of the components in the computer.

### **36. What are the functions of GPU?**

The graphics processing unit, or GPU, has become one of the most important types of computing technology, both for personal and business computing. Designed for parallel processing, the GPU is used in a wide range of applications, including graphics and video rendering. Although they're best known for their capabilities in gaming, GPUs are becoming more popular for use in creative production and artificial intelligence (AI).

GPUs were originally designed to accelerate the rendering of 3D graphics. Over time, they became more flexible and programmable, enhancing their capabilities. This allowed graphics programmers to create more interesting visual effects and realistic scenes with advanced lighting and shadowing techniques. Other developers also began to tap the power of GPUs to dramatically accelerate additional workloads in high performance computing (HPC), deep learning, and more.

### **37. What is Recursive function?**

A function that calls itself is known as a recursive function. And, this technique is known as recursion.

```
void recurse()
{
    ...
    recurse();
    ...
}

int main()
{
    ...
    recurse();
    ...
}
```

### 38. What is Deadlock? What are deadlock conditions?

Deadlock is a situation where two or more processes are waiting for each other. For example, let us assume, we have two processes P1 and P2. Now, process P1 is holding the resource R1 and is waiting for the resource R2. At the same time, the process P2 is having the resource R2 and is waiting for the resource R1. So, the process P1 is waiting for process P2 to release its resource and at the same time, the process P2 is waiting for process P1 to release its resource. And no one is releasing any resource. So, both are waiting for each other to release the resource. This leads to infinite waiting and no work is done here. This is called Deadlock.

There are four different conditions that result in Deadlock. These four conditions are also known as Coffman conditions and these conditions are not mutually exclusive. Let's look at them one by one.

**Mutual Exclusion:** A resource can be held by only one process at a time. In other words, if a process P1 is using some resource R at a particular instant of time, then some other process P2 can't hold or use the same resource R at that particular instant of time. The process P2 can make a request for that resource R but it can't use that resource simultaneously with process P1.

**Hold and Wait:** A process can hold a number of resources at a time and at the same time, it can request for other resources that are being held by some other process. For example, a process P1 can hold two resources R1 and R2 and at the same time, it can request some resource R3 that is currently held by process P2.

**No preemption:** A resource can't be preempted from the process by another process, forcefully. For example, if a process P1 is using some resource R, then some other process P2 can't forcefully take that resource. If it is so, then what's the need for various scheduling algorithm. The process P2 can request for the resource R and can wait for that resource to be freed by the process P1.

**Circular Wait:** Circular wait is a condition when the first process is waiting for the resource held by the second process, the second process is waiting for the resource held by the third process, and so on. At last, the last process is waiting for the resource held by the first process. So, every process is waiting for each other to release the resource and no one is releasing their own resource. Everyone is waiting here for getting the resource. This is called a circular wait.

### 39. What is the basic structure of SQL and what are its use?

SQL stands for Structured Query Language. It is a widely used programming language designed for working with Relational DataBase Management System. SQL can be used to insert, search, update, and delete database records. Basic structure of an SQL expression consists of select, from and where clauses.

**select clause** lists attributes to be copied - corresponds to relational algebra project.

**from clause** corresponds to Cartesian product - lists relations to be used.

**where clause** corresponds to selection predicate in relational algebra.

#### 40. What do you know about leaner search?

Linear search is a very simple search algorithm. In this type of search, a sequential search is made over all items one by one. Every item is checked and if a match is found then that particular item is returned, otherwise the search continues till the end of the data collection.

#### 41. What is Fibonacci series?

The Fibonacci numbers are the numbers in the following integer sequence.

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, .....

In mathematical terms, the sequence  $F_n$  of Fibonacci numbers is defined by the recurrence relation  $F_n = F_{n-1} + F_{n-2}$  with seed values  $F_0 = 0$  and  $F_1 = 1$ .

#### 42. What is Big O notation, Omega Notation, Theta Notation?

**Big O Notation (O):** It represents the upper bound of the runtime of an algorithm. Big O Notation's role is to calculate the longest time an algorithm can take for its execution, i.e., it is used for calculating the worst-case time complexity of an algorithm.

**Omega Notation ( $\Omega(n)$ ):** It represents the lower bound of the runtime of an algorithm. It is used for calculating the best time an algorithm can take to complete its execution, i.e., it is used for measuring the best case time complexity of an algorithm.

**Theta Notation ( $\Theta(n)$ ):** It carries the middle characteristics of both Big O and Omega notations as it represents the lower and upper bound of an algorithm.

#### 43. What is NoSQL?

NoSQL databases are non-tabular databases and store data differently than relational tables. NoSQL databases come in a variety of types based on their data model. The main types are document, key-value, wide-column, and graph. They provide flexible schemas and scale easily with large amounts of data and high user loads.

NoSQL databases are purpose built for specific data models and have flexible schemas for building modern applications. NoSQL databases are widely recognized for their ease of development, functionality, and performance at scale. This page includes resources to help you better understand NoSQL databases and to get started.

NoSQL databases use a variety of data models for accessing and managing data. These types of databases are optimized specifically for applications that require large data volume, low latency, and flexible data models, which are achieved by relaxing some of the data consistency restrictions of other databases.

#### 44. What is Triggers in DBMS?

Triggers are the SQL statements that are automatically executed when there is any change in the database. The triggers are executed in response to certain events(INSERT, UPDATE or DELETE) in a particular table. These triggers help in maintaining the integrity of the data by changing the data of the database in a systematic fashion.

#### 45. What are the DBMS ACID properties?

A transaction in a database system must maintain Atomicity, Consistency, Isolation, and Durability – commonly known as ACID properties – in order to ensure accuracy, completeness, and data integrity.

**Atomicity** – This property states that a transaction must be treated as an atomic unit, that is, either all of its operations are executed or none. There must be no state in a database where a transaction is left partially completed. States should be defined either before the execution of the transaction or after the execution/abortion/failure of the transaction.

**Consistency** – The database must remain in a consistent state after any transaction. No transaction should have any adverse effect on the data residing in the database. If the database was in a consistent state before the execution of a transaction, it must remain consistent after the execution of the transaction as well.

**Durability** – The database should be durable enough to hold all its latest updates even if the system fails or restarts. If a transaction updates a chunk of data in a database and commits, then the database will hold the modified data. If a transaction commits but the system fails before the data could be written on to the disk, then that data will be updated once the system springs back into action.

**Isolation** – In a database system where more than one transaction are being executed simultaneously and in parallel, the property of isolation states that all the transactions will be carried out and executed as if it is the only transaction in the system. No transaction will affect the existence of any other transaction.

#### 46. What is Inheritance and what are the properties of inheritance?

Inheritance is the capability of one class to derive or inherit the properties from another class.

The benefits of inheritance are:

- It represents real-world relationships well.
- It provides reusability of a code. We don't have to write the same code again and again. Also, it allows us to add more features to a class without modifying it.
- It is transitive in nature, which means that if class B inherits from another class A, then all the subclasses of B would automatically inherit from class A.

#### **47. What is Cache memory?**

Cache memory is a small-sized type of volatile computer memory that provides high-speed data access to a processor and stores frequently used computer programs, applications and data.

A temporary storage of memory, cache makes data retrieving easier and more efficient. It is the fastest memory in a computer, and is typically integrated onto the motherboard and directly embedded in the processor or main random access memory (RAM).

#### **48. Why Cache memory is expensive?**

The cache memory is usually SRAM (Static RAM) where the principle of storing the bit is latching it between two inverters. The output of one inverter is the input of another. This set up of two inverters when not accessed can continue to store the bit till there is power. In addition to this, there are two more transistors to access the memory cell. This makes 6 transistors in one memory cell which stores only 1 bit (6T SRAM). The latch provides the advantages of speed and reliable storage but it needs 6 transistors for 1 bit.

On the other hand, the main memory is usually DRAM (Dynamic RAM) where the principle of storing the bit is storing charge in the capacitor. The capacitor is hooked to one transistor to act as an access transistor. In such memory cells, every bit is rewritten after every read operation. This makes it a bit slower but it requires a smaller space (since it needs only 1 transistor and 1 capacitor to store 1 bit).

There are many other types of SRAMs and DRAMs but I guess you get the general idea and difference in the storing principle between these two. And that is the simple reason why SRAMs (Cache) are usually more expensive than DRAMs (Main Memory).

#### **49. What is Unicode?**

Unicode is a universal character encoding standard that assigns a code to every character and symbol in every language in the world. Since no other encoding standard supports all languages, Unicode is the only encoding standard that ensures that you can retrieve or combine data using any combination of languages. Unicode is required with XML, Java, JavaScript, LDAP, and other web-based technologies.

#### **50. What do you know about Tower of Hanoi?**

Tower of Hanoi is a mathematical puzzle where we have three rods and n disks. The objective of the puzzle is to move the entire stack to another rod, obeying the following simple rules:

- Only one disk can be moved at a time.
- Each move consists of taking the upper disk from one of the stacks and placing it on top of another stack i.e. a disk can only be moved if it is the uppermost disk on a stack.
- No disk may be placed on top of a smaller disk.

### **51. What is the difference between Homogeneous and Heterogenous data?**

A data set is homogeneous if it is made up of things that are similar to each other it means data from the exact same source. In a typical scenario of supervised learning, this will result in the data set to have the exact same label across the entire set.

The heterogeneous data refer to any data that has a high variability of data formats. They are perhaps indefinite and pose low qualities due to missing values, high data redundancy, and untruthfulness. It is very complicated to combine heterogeneous data for meeting the demands of business information.

### **52. Differentiate between Memory and Storage.**

The main difference between computer memory and storage is that memory stores data short-term for immediate access. A computer's moment-to-moment operations are performed using short-term data access — loading applications, browsing the Web, or editing a spreadsheet. Memory is volatile storage, which means that when you turn the computer off, the data disappears.

Storage (either a hard drive or a solid state drive) stores data long-term for permanent access. It's the component that accesses and stores your files, applications, and operating system. The storage drive is non-volatile, which means the data is stored even if you turn off the computer. For more information about solid state drives, read here. Memory and storage work in tandem with your computer's processor (CPU) to access and use data.

### **53. What is CMOS?**

CMOS (complementary metal-oxide semiconductor) is the semiconductor technology used in the transistors that are manufactured into most of today's computer microchips. Semiconductors are made of silicon and germanium, materials which "sort of" conduct electricity, but not enthusiastically. Areas of these materials that are "doped" by adding impurities become full-scale conductors of either extra electrons with a negative charge (N-type transistors) or of positive charge carriers (P-type transistors). In CMOS technology, both kinds of transistors are used in a complementary way to form a current gate that forms an effective means of electrical control. CMOS transistors use almost no power when not needed. As the current direction changes more rapidly, however, the transistors become hot. This characteristic tends to limit the speed at which microprocessors can operate.

### **54. Why do we use Debugging?**

Software programs undergo heavy testing, updating, troubleshooting, and maintenance during the development process. Usually, the software contains errors and bugs, which are routinely removed. Debugging is the process of fixing a bug in the software. It refers to identifying, analyzing and removing errors. This process begins after the software fails to execute properly and concludes by solving the problem and successfully testing the software. But, it is considered to be an extremely complex and tedious task because errors need to be resolved at all stages of debugging.

## 55. Differentiate between Constructor and Destructor.

### Constructor

- It helps to allocate memory to an object.
- It can take arguments.
- It is called automatically when an object is created.
- It allows an object to initialize a value before it is used.
- They are called in the successive order of their creation.
- There can be multiple constructors in a single class.
- The copy constructor allows the constructor to declare and initialize an object from another object.
- It can be overloaded.

Example:

```
class_name( arguments if any )
{
};
```

### Destructor

- It deallocates the memory of an object.
- It doesn't take any argument.
- It is called automatically when the block is exited or when the program terminates.
- They allow objects to execute code when it is being destroyed.
- They are called in the reverse order of their creation.
- There is a single destructor in a class.
- Destructor can't be overloaded.

Example:

```
~class_name( no arguments )
{
};
```

## 56. What is prime number?

A prime number is a number that can only be divided by itself and 1 without remainders. A prime number is a number greater than 1 with only two factors – themselves and 1. A prime number cannot be divided by any other numbers without leaving a remainder. An example of a prime number is 13. It can only be divided by 1 and 13.

### 57. What is Wireless Sensor network?

Wireless Sensor Network (WSN) is an infrastructure-less wireless network that is deployed in a large number of wireless sensors in an ad-hoc manner that is used to monitor the system, physical or environmental conditions. Sensor nodes are used in WSN with the onboard processor that manages and monitors the environment in a particular area. They are connected to the Base Station which acts as a processing unit in the WSN System. Base Station in a WSN System is connected through the Internet to share data.

### Applications of WSN:

- Internet of Things (IOT)
- Surveillance and Monitoring for security, threat detection
- Environmental temperature, humidity, and air pressure
- Noise Level of the surrounding
- Medical applications like patient monitoring
- Agriculture
- Landslide Detection

### 58. What do you understand by Universal Gate?

A universal gate is a logic gate which can implement any Boolean function without the need to use any other type of logic gate. The NOR gate and NAND gate are universal gates. This means that you can create any logical Boolean expression using only NOR gates or only NAND gates.

### 59. write difference between database schema and instance

#### Schema

- It is defined as the overall description of the database.
- It remains the same for the entire database.
- It doesn't change frequently.
- It is used to define the basic structure of the database.
- It tells about how the data would be stored in a database.

#### Instance

- It refers to the collection of information that is stored in the database at a specific moment.
- Data in these instances can be changed.
- This can be done using addition, deletion, and updating.
- The instance changes frequently.
- It is the set of Information that is stored at a particular time

## 60. What is Function Overloading and Overriding?

1. Function Overloading is when multiple function with same name exist in a class. Function Overriding is when function have same prototype in base class as well as derived class.
2. Function Overloading can occur without inheritance. Function Overriding occurs when one class is inherited from another class.
3. Overloaded functions must differ in either number of parameters or type of parameters should be different. In Overridden function parameters must be same.

## 61. How to Print in PHP?

The echo statement can be used with or without parentheses: echo or echo().

Example

```
<?php  
echo "Hello world!<br>";  
?>
```

## 62. What is Aggregate function?

In database management an aggregate function is a function where the values of multiple rows are grouped together as input on certain criteria to form a single value of more significant meaning.

Various Aggregate Functions

- |            |          |
|------------|----------|
| 1. Count() | 4. Min() |
| 2. Sum()   | 5. Max() |
| 3. Avg()   |          |

## 63. What is GUI?

A GUI (graphical user interface) is a system of interactive visual components for computer software. A GUI displays objects that convey information, and represent actions that can be taken by the user. The objects change color, size, or visibility when the user interacts with them.

## 64. What are the functions of operating system?

An Operating System acts as a communication bridge (interface) between the user and computer hardware. The purpose of an operating system is to provide a platform on which a user can execute programs in a convenient and efficient manner. The main task an operating system carries out is the allocation of resources and services, such as the allocation of memory, devices, processors, and information. The operating system also includes programs to manage these resources, such as a traffic controller, a scheduler, memory management module, I/O programs, and a file system.

#### **65. Differentiate between Syntax and Semantic error.**

Syntax errors and "semantic" errors are not the same. The syntax error is an incorrect construction of the source code, whereas a semantic error is erroneous logic that produces the wrong result when executed.

#### **66. What is difference between mysql and nosql?**

- MySQL is a relational database that is based on tabular design whereas NoSQL is non-relational in nature with its document-based design.
- MySQL has established a database, covering huge IT market whereas NoSQL databases are the latest arrival, hence still gaining popularity among big IT giants.
- MySQL database with its settled market encompasses a huge community whereas the NoSQL database with the short span arrival has a comparatively short community.
- MySQL is not so easily scalable with their rigid schema restrictions whereas NoSQL can be easily scaled with their dynamic schema nature.
- MySQL is one of the types of relational database whereas NoSQL is more of design based database type with examples like MongoDB, Couch DB, etc.
- MySQL is available with a wide array of reporting tools help application's validity whereas NoSQL databases lack reporting tools for analysis and performance testing.
- MySQL being a relational database is less flexible with its design constraint whereas NoSQL being non-relational in nature, provides a more flexible design as compared to MySQL.
- MySQL is being used with a standard query language called SQL whereas NoSQL like databases misses a standard query language.
- MySQL like a relational database can provide a performance issue for a huge amount of data, hence require optimization of queries whereas NoSQL databases like MongoDB are good at performance even with the dataset is huge in size.

#### **67. Why LIFO is used? Where LIFO is used?**

LIFO stands for Last-In-First-Out. In this approach, the new element is inserted above the existing element, So that the newest element can be at the top and taken out first. The data structure that implements LIFO is Stack.

#### **68. What are the functions of ALU?**

An arithmetic logic unit (ALU) is a digital circuit used to perform arithmetic and logic operations. It represents the fundamental building block of the central processing unit (CPU) of a computer. The ALU performs simple addition, subtraction, multiplication, division, and logic operations, such as OR and AND. The memory stores the program's instructions and data.

## 69. What does Referential Integrity (RI) mean?

Referential integrity refers to the relationship between tables. In order to maintain referential integrity, the relational data in database tables has to be universally configurable so that changes in one part of the system don't lead to unanticipated problems elsewhere.

Specifically, keys that reference elements of other tables need to be connected to those other fields, so that if there is a change, everything gets updated together, and not separately.

## 70. What are the major components of a web search engine?

A search engine normally consists of four components, that are:

- search interface
- crawler (also known as a spider or bot)
- indexer
- database.

## 71. What is View and what do you understand by index in DB?

### SQL Index

Indexes are special lookup tables. It is used to retrieve data from the database very fast. An Index is used to speed up select queries and where clauses. But it slows down the data input with insert and update statements. Indexes can be created or dropped without affecting the data. An index in a database is just like an index in the back of a book.

For example: When you reference all pages in a book that discusses a certain topic, you first have to refer to the index, which alphabetically lists all the topics and then referred to one or more specific page numbers.

### Views in SQL

Views in SQL are considered as a virtual table. A view also contains rows and columns. To create the view, we can select the fields from one or more tables present in the database. A view can either have specific rows based on certain condition or all the rows of a table.

## 72. Full form of RAID? Why do we use RAID? What are the Levels of RAID?

RAID stands for Redundant Array of Inexpensive/Independent Disks. RAID is a technique of data virtualization that uses multiple hard disks or solid-state drives to provide for data redundancy and performance improvement. Redundancy provides threat resilience to the data in case of unforeseen events, thus proving advantageous over the conventional storage technique of having a “single large expensive disk” (SLED). So instead of having all the data on one SLED, RAID instead makes use of multiple small-sized disks allowing faster I/O operations and providing robustness to the whole system. In case one of the disks in the system crashes the others remain safe and the whole system doesn't collapse.

### Advantages

- Data access speed: Data access speed in RAID systems is undeniably better than SLED systems. RAID 0, RAID 4 and RAID 5 are specially designed for fast and cheap data access.
- Redundant data: Data redundancy provided by RAID systems provides for a reliable storage system. RAID 1 uses data mirroring to keep copies of data to ensure reliability.
- Error Correction: RAID 2, RAID 3, RAID 4 and RAID 5 use hamming code parity for error correction in data.
- Simultaneous I/O requests: RAID 0, RAID 4 and RAID 5 use the striping storage techniques hence support multiple I/O operations at the same time.
- Bulk data transfer: RAID 3 provides for quick bulk data transfers.
- Data security: Striping and continuous parity checks provide for high data security.

### Disadvantages

- Cost: The cost of RAID systems is more than SLED systems.
- Data loss: The RAID systems that do not use mirroring are vulnerable to some data loss.
- Choice of RAID level: Given that there are so many RAID levels with each having some drawbacks and features of their it is a difficult choice as to what system can be used.
- Improper use: If RAID is not use properly, the overall performance of the system as a whole may decrease.
- Complex technology: RAID is a difficult to use architecture of data storage and requires skilled and proficient people to unlock the full potential of RAID.

### RAID levels:

- RAID 0 – striping
- RAID 1 – mirroring
- RAID 5 – striping with parity
- RAID 6 – striping with double parity
- RAID 10 – combining mirroring and striping

**73. What are the layers of OSI?**

OSI model		
Layer	Name	Example protocols
7	Application Layer	HTTP, FTP, DNS, SNMP, Telnet
6	Presentation Layer	SSL, TLS
5	Session Layer	NetBIOS, PPTP
4	Transport Layer	TCP, UDP
3	Network Layer	IP, ARP, ICMP, IPSec
2	Data Link Layer	PPP, ATM, Ethernet
1	Physical Layer	Ethernet, USB, Bluetooth, IEEE802.11

**74. What is BIOS? What are the Properties of BIOS? What happens when BIOS fails? What is Booting in OS?**

Every computer with a motherboard includes a special chip referred to as the BIOS or ROM BIOS (Read Only Memory Basic Input/Output System). The BIOS includes instructions on how to load basic computer hardware. The BIOS also includes a test referred to as a POST (Power On Self Test) which will ensure that the computer meets requirements to boot up properly. If the computer does not pass the POST you will receive a combination of beeps indicating what is malfunctioning within the computer.

**The BIOS has 4 main functions:**

- POST - Test computer hardware insuring hardware is properly functioning before starting process of loading Operating System.
- Bootstrap Loader - Process of locating the operating system. If capable Operating system located BIOS will pass the control to it.
- BIOS - Software / Drivers which interfaces between the operating system and your hardware. When running DOS or Windows you are using complete BIOS support.
- CMOS Setup - Configuration program. Which allows you to configure hardware settings including system settings such as computer passwords, time, and date.

BIOS is a piece of program. When the system starts, the register EIP is initialized to FFFF0 to execute the JMP instruction there, which leads to the execution of the system BIOS code.

BIOS will initialize other devices; initialize the interrupt vector; find other BIOS programs and run them.

If your BIOS update procedure fails, your system will be useless until you replace the BIOS code.

You have two options:

Install a replacement BIOS chip (if the BIOS is located in a socketed chip).

Use the BIOS recovery feature (available on many systems with surface-mounted or soldered-in-place BIOS chips).

### 75. SDLC कि? Write down the main phases of SDLC? What are the steps to build a software?

Software Development Life Cycle is the application of standard business practices to building software applications. It's typically divided into six to eight steps: Planning, Requirements, Design, Build, Document, Test, Deploy, Maintain. Some project managers will combine, split, or omit steps, depending on the project's scope. These are the core components recommended for all software development projects.

SDLC is a way to measure and improve the development process. It allows a fine-grain analysis of each step of the process. This, in turn, helps companies maximize efficiency at each stage. As computing power increases, it places a higher demand on software and developers. Companies must reduce costs, deliver software faster, and meet or exceed their customers' needs. SDLC helps achieve these goals by identifying inefficiencies and higher costs and fixing them to run smoothly.

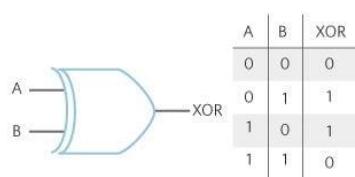
#### Phases of SDLC:

1. Planning
2. Define Requirements
3. Design and Prototyping
4. Software Development
5. Testing
6. Deployment
7. Operations and Maintenance

### 76. What is XOR gate?

“XOR” an abbreviation for “Exclusively-OR.” The simplest XOR gate is a two-input digital circuit that outputs a logical “1” if the two input values differ, i.e., its output is a logical “1” if either of its inputs are 1, but not at the same time (exclusively). The symbol and truth table for an XOR is shown in Figure 1. The Boolean expression for a two-input XOR gate, with inputs A and B and output X:

$$X = A \oplus B$$



### **77. What is Optical Disk and how does it work?**

An optical disk is an electronic data storage medium that can be written to and read from using a low-powered laser beam. Most of today's optical disks are available in three formats: compact disks (CDs), digital versatile disks (DVDs) -- also referred to as digital video disks -- and Blu-ray disks, which provide the highest capacities and data transfer rates of the three.

Optical disks rely on a red or blue laser to record and read data. Most of today's optical disks are flat, circular and 12 centimeters in diameter. An optical disk drive uses a laser beam to read the data from the disk as it is spinning. It distinguishes between the pits and lands based on how the light reflects off the recording material. The drive uses the differences in reflectivity to determine the 0 and 1 bits that represent the data.

### **78. Where the mass of an object is zero?**

The weight of an object is zero when the net gravitational force acting on the object is zero. However, the mass of an object can never be zero since mass is a property of matter.

### **79. What are the fundamental colors of a TV screen?**

A monitor or TV screen generates three colors of light (red, green, and blue) and the different colors we see are due to different combinations and intensities of these three primary colors.

### **80. What are the programming languages that are interpreter based?**

An Interpreter directly executes instructions written in a programming or scripting language without previously converting them to an object code or machine code. Examples of interpreted languages are Perl, Python and Matlab.

### **81. What do you know about the speed of Supercomputer?**

A supercomputer is a computer with a high level of performance compared to a general-purpose computer. **Performance of a supercomputer is measured in floating-point operations per second (FLOPS)** instead of million instructions per second (MIPS). Supercomputers contain tens of thousands of processors and can perform billions and trillions of calculations or computations per second. Some supercomputers can perform up to a hundred quadrillion FLOPS. Since information moves quickly between processors in a supercomputer (compared to distributed computing systems) they are ideal for real-time applications.

### 82. What do you know about active hub and passive hub?

**Active hub:** These hubs regenerate our signals as well as amplifies the signal. Active hubs need electricity to work.

**Passive hub:** Talking about passive hubs, it simply distributes the signal coming from the previous ports. Passive hub neither regenerates any signal nor amplifies, therefore it does not require electricity to work.

### 83. What is 2 tier and 3 tier architecture?

**2-Tier Architecture:** A 2 Tier Architecture in DBMS is a Database architecture where the presentation layer runs on a client (PC, Mobile, Tablet, etc.), and data is stored on a server called the second tier. Two tier architecture provides added security to the DBMS as it is not exposed to the end-user directly. It also provides direct and faster communication.

Example: A Contact Management System created using MS- Access.

**3-Tier Architecture:** A 3 Tier Architecture in DBMS is the most popular client server architecture in DBMS in which the development and maintenance of functional processes, logic, data access, data storage, and user interface is done independently as separate modules. Three Tier architecture contains a presentation layer, an application layer, and a database server.

### 84. What are the functions of LLC sublayer and MAC sublayer?

**Logical Link Control (LLC) sublayer** provides the logic for the data link. Thus, it controls the synchronization, flow control, and error checking functions of the data link layer.

**Media Access Control (MAC) sublayer** provides control for accessing the transmission medium. It is responsible for moving data packets from one network interface card (NIC) to another, across a shared transmission medium. Physical addressing is handled at the MAC sublayer.

### 85. What is system call in OS?

In computing, a system call is the programmatic way in which a computer program requests a service from the kernel of the operating system it is executed on. A system call is a way for programs to interact with the operating system. A computer program makes a system call when it makes a request to the operating system's kernel. System call provides the services of the operating system to the user programs via Application Program Interface(API). It provides an interface between a process and operating system to allow user-level processes to request services of the operating system. System calls are the only entry points into the kernel system. All programs needing resources must use system calls.

### 86. What is VPN?

A virtual private network (VPN) gives you online privacy and anonymity by creating a private network from a public internet connection. VPNs mask your internet protocol (IP) address so your online actions are virtually untraceable. Most important, VPN services establish secure and encrypted connections to provide greater privacy than even a secured Wi-Fi hotspot.

### 87. What is page fault?

A page fault occurs when a program attempts to access a block of memory that is not stored in the physical memory, or RAM. The fault notifies the operating system that it must locate the data in virtual memory, then transfer it from the storage device, such as an HDD or SSD, to the system RAM.

### 88. SRAM VS DRAM

SRAM	DRAM
<b>SRAM stands for Static Random Access Memory.</b>	<b>DRAM stands for Dynamic Random Access Memory.</b>
<b>Transistors are used to store information in SRAM</b>	<b>Capacitors are used to store information in DRAM</b>
<b>Refreshing is not required.</b>	<b>Refreshing is required.</b>
<b>SRAM offers low packaging density.</b>	<b>DRAM offers high packaging density.</b>
<b>SRAM storage capacity is in Mega Bytes.</b>	<b>DRAM storage capacity is in Giga Bytes.</b>
<b>SRAM consumes less power.</b>	<b>DRAM consumes much power.</b>
<b>SRAM is costlier than DRAM</b>	<b>DRAM is cheap compared to SRAM</b>

### 89. Hub Vs Switch

Hub	Switch
<b>Hub transmits the signal to every port except the port that received the signal</b>	<b>Switch do not transmit to every port rather it sends to specific addresses</b>
<b>Hub operates on the physical layer</b>	<b>Switch operates on the data link layer</b>
<b>Transmission mode for Hub is Half Duplex</b>	<b>Transmission mode for Switch is Full Duplex</b>
<b>Hub is a passive device</b>	<b>Switch is an active device</b>
<b>Hub Not an intelligent device</b>	<b>Switch is an intelligent device</b>
<b>Speed is up to 10 Mbps</b>	<b>Speed is more than Hub, up to 10 Gbps</b>
<b>Hub does not use software</b>	<b>Switch has software for administration</b>
<b>Hub can have maximum 4 ports.</b>	<b>Switch can have 24 to 28 ports</b>
<b>Hub does not provide packet filtering</b>	<b>Switch provides packet filtering</b>

## 90. IP address Vs MAC address

MAC Address	IP Address
MAC Address stands for Media Access Control Address.	IP Address stands for Internet Protocol Address.
NIC Card's Manufacturer provides the MAC Address.	Internet Service Provider provides IP Address.
MAC Address is used to ensure the physical address of a computer.	IP Address is the logical address of the computer.
MAC Address operates in the data link layer.	IP Address operates in the network layer.
MAC Address helps in simply identifying the device.	IP Address identifies the connection of the device on the network.
MAC Address of computer cannot be changed with time and environment.	IP Address modifies with the time and environment.

## 91. DDL Vs DML

DDL	DML
It stands for Data Definition Language.	It stands for Data Manipulation Language.
It is used to create database schema and can be used to define some constraints as well.	It is used to add, retrieve or update the data.
It basically defines the column (Attributes) of the table.	It add or update the row of the table. These rows are called as tuple.
It doesn't have any further classification.	It is further classified into Procedural and Non-Procedural DML.
Basic command present in DDL are CREATE, DROP, RENAME, ALTER etc.	BASIC command present in DML are UPDATE, INSERT, MERGE etc.
DDL does not use WHERE clause in its statement.	While DML uses WHERE clause in its statement.

## 92. Stack Vs Queue

Stack	Queue
The stack is based on LIFO(Last In First Out) principle	The queue is based on FIFO(First In First Out) principle.
Push and Pop Operation takes place from one end of the stack	Enqueue and Dequeue Operation takes place from a different end of the queue
The most accessible element is called Top and the least accessible is called the Bottom of the stack	The insertion end is called Rear End and the deletion end is called the Front End.
Only one pointer is used for performing operations	Two pointers are used to perform operations
Used to solve the recursive type problems	Used to solve the problem having sequential processing

### 93. Interpreter Vs Compiler

Interpreter	Compiler
Interpreter translates just one statement of the program at a time into machine code.	Compiler scans the entire program and translates the whole of it into machine code at once.
An interpreter takes very less time to analyze the source code. However, the overall time to execute the process is much slower.	A compiler takes a lot of time to analyze the source code. However, the overall time taken to execute the process is much faster.
An interpreter does not generate an intermediary code. Hence, an interpreter is highly efficient in terms of its memory.	A compiler always generates an intermediary object code. It will need further linking. Hence more memory is needed.
Keeps translating the program continuously till the first error is confronted. If any error is spotted, it stops working and hence debugging becomes easy.	A compiler generates the error message only after it scans the complete program and hence debugging is relatively harder while working with a compiler.
Interpreters are used by programming languages like Ruby and Python for example.	Compilers are used by programming languages like C and C++ for example.

### 94. Primary Vs Foreign Key

PRIMARY KEY	FOREIGN KEY
A primary key is used to ensure data in the specific column is unique.	A foreign key is a column or group of columns in a relational database table that provides a link between data in two tables.
It uniquely identifies a record in the relational database table.	It refers to the field in a table which is the primary key of another table.
Only one primary key is allowed in a table.	Whereas more than one foreign key are allowed in a table.
It is a combination of UNIQUE and Not Null constraints.	It can contain duplicate values and a table in a relational database.
It does not allow NULL values.	It can also contain NULL values.
Its value cannot be deleted from the parent table.	Its value can be deleted from the child table.
It constraint can be implicitly defined on the temporary tables.	It constraint cannot be defined on the local or global temporary tables.

### 95. High Level Vs Low Level Language

High Level Language	Low Level Language
<b>It is programmer friendly language.</b>	<b>It is a machine friendly language.</b>
<b>High level language is less memory efficient.</b>	<b>Low level language is high memory efficient.</b>
<b>It is easy to understand.</b>	<b>It is tough to understand.</b>
<b>It is simple to debug.</b>	<b>It is complex to debug comparatively.</b>
<b>It is simple to maintain.</b>	<b>It is complex to maintain comparatively.</b>
<b>It is portable.</b>	<b>It is non-portable.</b>
<b>It can run on any platform.</b>	<b>It is machine-dependent.</b>
<b>It needs compiler or interpreter for translation.</b>	<b>It needs assembler for translation.</b>
<b>It is used widely for programming.</b>	<b>It is not commonly used now-a-days in programming</b>

### 96. IPv4 Vs IPv6

IPv4	IPv6
<b>IPv4 has a 32-bit address length</b>	<b>IPv6 has a 128-bit address length</b>
<b>It can generate <math>4.29 \times 10^9</math> address space</b>	<b>Address space of IPv6 is quite large it can produce <math>3.4 \times 10^{38}</math> address space</b>
<b>The Security feature is dependent on application</b>	<b>IPSEC is an inbuilt security feature in the IPv6 protocol</b>
<b>Address representation of IPv4 is in decimal</b>	<b>Address Representation of IPv6 is in hexadecimal</b>
<b>Fragmentation performed by Sender and forwarding routers</b>	<b>In IPv6 fragmentation performed only by the sender</b>
<b>In IPv4 Packet flow identification is not available</b>	<b>In IPv6 packet flow identification are Available and uses the flow label field in the header</b>
<b>In IPv4 checksum field is available</b>	<b>In IPv6 checksum field is not available</b>
<b>It has broadcast Message Transmission Scheme</b>	<b>In IPv6 multicast and anycast message transmission scheme is available</b>
<b>In IPv4 Encryption and Authentication facility not provided</b>	<b>In IPv6 Encryption and Authentication are provided</b>
<b>IPv4 has a header of 20-60 bytes.</b>	<b>IPv6 has header of 40 bytes fixed</b>

### 97. Array Vs Linked List

Array	Linked list
An array is a collection of elements of a similar data type.	A linked list is a collection of objects known as a node where node consists of two parts, i.e., data and address.
Array elements store in a contiguous memory location.	Linked list elements can be stored anywhere in the memory or randomly stored.
Array works with a static memory.	The Linked list works with dynamic memory
Accessing any element in an array is faster as the element in an array can be directly accessed through the index.	Accessing an element in a linked list is slower as it starts traversing from the first element of the linked list.
In the case of an array, memory is allocated at compile-time.	In the case of a linked list, memory is allocated at run time.

### 98. Call by Value Vs Call by Reference?

No.	Call by value	Call by reference
1	A copy of the value is passed into the function	An address of value is passed into the function
2	Changes made inside the function is limited to the function only. The values of the actual parameters do not change by changing the formal parameters.	Changes made inside the function validate outside of the function also. The values of the actual parameters do change by changing the formal parameters.
3	Actual and formal arguments are created at the different memory location	Actual and formal arguments are created at the same memory location

### 99. Strong entity Vs week entity.

Strong entity	Week entity
Strong entity has a primary key.	Weak entity has a partial key.
Strong entity is independent	Weak entity is dependent on a strong entity
Strong entity indicated by a single rectangle.	Strong entity indicated by a double rectangle.
Two strong entity's relationship is indicated by a single diamond.	One strong and one weak entity is indicated by a double diamond.
Strong entity may be or may not be participate relationships.	Weak entity always participates relationships.
In strong entity connecting line is a single line	In weak entity connecting line is a double line

### 100.http Vs https

Parameter	HTTP	HTTPS
Protocol	It is hypertext transfer protocol.	It is hypertext transfer protocol with secure.
Security	It is less secure as the data can be vulnerable to hackers.	It is designed to prevent hackers from accessing critical information. It is secure against such attacks.
Port	It uses port 80 by default	It uses port 443 by default.
Used for	It's a good fit for websites designed for information consumption like blogs.	If the website needs to collect the private information such as credit card number, then it is a more secure protocol.
Scrambling	HTTP does not scramble the data to be transmitted. That's why there is a higher chance that transmitted information is available to hackers.	HTTPS scrambles the data before transmission. At the receiver end, it descrambles to recover the original data. Therefore, the transmitted information is secure which can't be hacked.
Domain Name Validation	HTTP website do not need SSL.	HTTPS requires SSL certificate.
Search Ranking	HTTP does not improve search rankings.	HTTPS helps to improve search ranking.

## The Differences

### 1. Primary Vs Secondary Memory

Primary memory	Secondary memory
Primary memory is temporary.	Secondary memory is permanent.
Primary memory is directly accessible by Processor/CPU.	Secondary memory is not directly accessible by the CPU.
Nature of Parts of Primary memory varies, RAM- volatile in nature. ROM- Non-volatile.	It's always Non-volatile in nature.
Primary memory devices are more expensive than secondary storage devices.	Secondary memory devices are less expensive when compared to primary memory devices.
The memory devices used for primary memory are semiconductor memories.	The secondary memory devices are magnetic and optical memories.
Primary memory is also known as Main memory or Internal memory.	Secondary memory is also known as External memory or Auxiliary memory.
Examples: RAM, ROM, Cache memory, PROM, EPROM, Registers, etc.	Examples: Hard Disk, Floppy Disk, Magnetic Tapes, etc.

### 2. RAM Vs ROM

RAM	ROM
RAM stands for Random Access Memory	ROM stands for Read Only Memory
RAM data is volatile that means it depends on voltage. Data stores as long as power supply is there.	ROM data is Non volatile. Data stores even when power supply is not there.
RAM data can be read, erased or modified.	ROM data can only be read.
RAM is used to store data that CPU needs for current instruction processing.	ROM is used to store data that is needed to bootstrap the computer.
RAM is faster	ROM is slower than RAM
RAM is costly	ROM is cheaper than RAM

### 3. SRAM VS DRAM

SRAM	DRAM
SRAM stands for Static Random Access Memory.	DRAM stands for Dynamic Random Access Memory.
Transistors are used to store information in SRAM	Capacitors are used to store information in DRAM
Refreshing is not required.	Refreshing is required.
SRAM offers low packaging density.	DRAM offers high packaging density.
SRAM storage capacity is in Mega Bytes.	DRAM storage capacity is in Giga Bytes.
SRAM consumes less power.	DRAM consumes much power.
SRAM is costlier than DRAM	DRAM is cheap compared to SRAM

#### 4. Maskable Vs Non Maskable Interrupt

Maskable Interrupt	Non Maskable Interrupt
Maskable interrupt can be easily disable or ignored	Non Maskable interrupt can not be ignored or disabled by any means
Maskable interrupts used to interface with peripheral device.	Non Maskable interrupt used for emergency purpose e.g. power failure, smoke detector etc.
When this type of interrupt occurs the system can handle it after executing current instructions	When this type of interrupt occurs it must halt execution of current instructions
It helps handling tasks that are of lower priority	It helps handling tasks that are of higher priority
A Maskable interrupt has comparatively higher response time.	A Non Maskable interrupt has comparatively very low response time.
Example: RST 5.5, RST 6.5, RST 7.5 of 8085	Example: Trap of 8085

#### 5. Microprocessor Vs Microcontroller

Microprocessor		Micro Controller								
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Microcontroller</td> <td style="padding: 5px;">Read-Only Memory</td> <td style="padding: 5px;">Read-Write Memory</td> </tr> <tr> <td style="padding: 5px;">Timer</td> <td style="padding: 5px;">I/O Port</td> <td style="padding: 5px;">Serial Interface</td> </tr> </table>			Microcontroller	Read-Only Memory	Read-Write Memory	Timer	I/O Port	Serial Interface
Microcontroller	Read-Only Memory	Read-Write Memory								
Timer	I/O Port	Serial Interface								
Microprocessor is heart of Computer system.		Micro Controller is a heart of embedded system.								
It is just a processor. Memory and I/O components have to be connected externally		Micro controller has external processor along with internal memory and i/O components								
Since memory and I/O has to be connected externally, the circuit becomes large.		Since memory and I/O are present internally, the circuit is small.								
Cannot be used in compact systems and hence inefficient		Can be used in compact systems and hence it is an efficient technique								
Cost of the entire system increases		Cost of the entire system is low								
Due to external components, the entire power consumption is high. Hence it is not suitable to use with devices running on stored power like batteries.		Since external components are low, total power consumption is less and can be used with devices running on stored power like batteries.								
Most of the microprocessors do not have power saving features.		Most of the micro controllers have power saving modes like idle mode and power saving mode. This helps to reduce power consumption even further.								
Since memory and I/O components are all external, each instruction will need external operation, hence it is relatively slower.		Since components are internal, most of the operations are internal instruction, hence speed is fast.								
Microprocessor have less number of registers, hence more operations are memory based.		Micro controller have more number of registers, hence the programs are easier to write.								
Microprocessors are based on von Neumann model/architecture where program and data are stored in same memory module		Micro controllers are based on Harvard architecture where program memory and Data memory are separate								
Mainly used in personal computers		Used mainly in washing machine, MP3 players								

## 6. Hub Vs Switch

Hub	Switch
Hub transmits the signal to every port except the port that received the signal	Switch do not transmit to every port rather it sends to specific addresses
Hub operates on the physical layer	Switch operates on the data link layer
Transmission mode for Hub is Half Duplex	Transmission mode for Switch is Full Duplex
Hub is a passive device	Switch is an active device
Hub Not an intelligent device	Switch is an intelligent device
Speed is up to 10 Mbps	Speed is more than Hub, up to 10 Gbps
Hub does not use software	Switch has software for administration
Hub can have maximum 4 ports.	Switch can have 24 to 28 ports
Hub does not provide packet filtering	Switch provides packet filtering

## 7. UTP Vs STP

UTP	STP
UTP stands for Unshielded Twisted Pair	STP stands for Shielded Twisted Pair
Made up of wires that are twisted together	Cable is enclosed in foil or mesh shield
UTP cables are noisier.	STP cables are less noisy
UTP has high crosstalk	STP has low crosstalk
UTP does not require a grounding cable	STP requires a grounding cable
Price is lower than STP	Price is more than UTP
UTP is suitable for small distance	STP is suitable for long distance
UTP does not require much maintenance	STP requires much maintenance

## 8. Analog Vs Digital Signal

Analog Signals	Digital Signals
Continuous signals	Discrete signals
Represented by sine waves	Represented by square waves
Human voice, natural sound, analog electronic devices are a few examples	Computers, optical drives, and other electronic devices
Continuous range of values	Discontinuous values
Records sound waves as they are	Converts into a binary waveform.
Only used in analog devices.	Suited for digital electronics like computers, mobiles and more.

## 9. IP address Vs MAC address

MAC Address	IP Address
<b>MAC Address stands for Media Access Control Address.</b>	<b>IP Address stands for Internet Protocol Address.</b>
<b>MAC Address is a six byte hexadecimal address.</b>	<b>IP Address is either a four-byte (IPv4) or an eight-byte (IPv6) address.</b>
<b>A device attached with MAC Address can retrieve by ARP protocol.</b>	<b>A device attached with IP Address can retrieve by RARP protocol.</b>
<b>NIC Card's Manufacturer provides the MAC Address.</b>	<b>Internet Service Provider provides IP Address.</b>
<b>MAC Address is used to ensure the physical address of a computer.</b>	<b>IP Address is the logical address of the computer.</b>
<b>MAC Address operates in the data link layer.</b>	<b>IP Address operates in the network layer.</b>
<b>MAC Address helps in simply identifying the device.</b>	<b>IP Address identifies the connection of the device on the network.</b>
<b>MAC Address of computer cannot be changed with time and environment.</b>	<b>IP Address modifies with the time and environment.</b>
<b>MAC Addresses can't be found easily by a third party.</b>	<b>IP Addresses can be found by a third party.</b>
<b>It is a 48-bit address that contains 6 groups of 2 hexadecimal digits, separated by either hyphens (-) or colons(:).</b>  <b>Example:</b> <b>00:FF:FF:AB:BB:AA</b> <b>or</b> <b>00-FF-FF-AB-BB-AA</b>	<b>IPv4 uses 32-bit addresses in dotted notations, whereas IPv6 uses 128-bit addresses in hexadecimal notations.</b>  <b>Example:</b> <b>IPv4 192.168.1.1</b> <b>IPv6 FFFF:F200:3204:0B00</b>
<b>No classes are used for MAC addressing.</b>	<b>IPv4 uses A, B, C, D, and E classes for IP addressing.</b>
<b>MAC Address sharing is not allowed.</b>	<b>In IP address multiple client devices can share the IP address.</b>

## 10. Active Vs Passive Attack

Active Attack	Passive Attack
Active attack tries to change the system resources or affect their operations.	Passive attack tries to read or make use of information from the system but does not change system resources.
Active attack is danger for integrity and availability	Passive attack is danger for confidentiality
In Active attack attention is on detection.	In Passive attack attention is on prevention.
Active attack causes system damage.	Passive attack does not cause system damage but it creates vulnerability.
Active attack depends on passive attack because active attack requires collection of information taken by passive attack.	Passive attack helps Active attack by giving sensitive information

## 11. DDL Vs DML

DDL	DML
It stands for Data Definition Language.	It stands for Data Manipulation Language.
It is used to create database schema and can be used to define some constraints as well.	It is used to add, retrieve or update the data.
It basically defines the column (Attributes) of the table.	It adds or updates the row of the table. These rows are called as tuple.
It doesn't have any further classification.	It is further classified into Procedural and Non-Procedural DML.
Basic command present in DDL are CREATE, DROP, RENAME, ALTER etc.	BASIC command present in DML are UPDATE, INSERT, MERGE etc.
DDL does not use WHERE clause in its statement.	While DML uses WHERE clause in its statement.

## 12. While Loop Vs Do While Loop

While Loop	Do-While Loop
This is entry-controlled loop. It checks condition before entering into loop	This is exit control loop. Checks condition when coming out from loop
The while loop may run zero or more times	Do-While may run more than one times but at least once.
The variable of test condition must be initialized prior to entering into the loop	The variable for loop condition may also be initialized in the loop also.
<pre>while(condition){     //statement }</pre>	<pre>do{     //statement }while(condition);</pre>

### 13. Stack Vs Queue

Stack	Queue
The stack is based on LIFO(Last In First Out) principle	The queue is based on FIFO(First In First Out) principle.
Insertion Operation is called Push Operation	Insertion Operation is called Enqueue Operation
Deletion Operation is called Pop Operation	Deletion Operation is called Dequeue Operation
Push and Pop Operation takes place from one end of the stack	Enqueue and Dequeue Operation takes place from a different end of the queue
The most accessible element is called Top and the least accessible is called the Bottom of the stack	The insertion end is called Rear End and the deletion end is called the Front End.
Only one pointer is used for performing operations	Two pointers are used to perform operations
Empty condition is checked using Top== -1	Empty condition is checked using Front== -1    Front == Rear + 1
Full condition is checked using Top == Max - 1	Full condition is checked using Rear == Max - 1
There are no variants available for stack	There are three types of variants i.e circular queue, double-ended queue and priority queue
Used to solve the recursive type problems	Used to solve the problem having sequential processing

### 14. Global Variable Vs Local Variable

Global Variable	Local Variable
Global variables are declared outside all the function blocks.	Local Variables are declared within a function block.
The scope remains throughout the program.	The scope is limited and remains within the function only in which they are declared.
Any change in global variable affects the whole program, wherever it is being used.	Any change in the local variable does not affect other functions of the program.
A global variable exists in the program for the entire time the program is executed.	A local variable is created when the function is executed, and once the execution is finished, the variable is destroyed.
It can be accessed throughout the program by all the functions present in the program.	It can only be accessed by the function statements in which it is declared and not by the other functions.
If the global variable is not initialized, it takes zero by default.	If the local variable is not initialized, it takes the garbage value by default.
Global variables are stored in the data segment of memory.	Local variables are stored in a stack in memory.
We cannot declare many variables with the same name.	We can declare various variables with the same name but in other functions.

### 15. Primary Key Vs Candidate Key

Comparison Basis	Primary Key	Candidate Key
Definition	<b>It is a unique and non-null key to identify each table's records in a schema uniquely.</b>	<b>It is also a unique key to identify records in relation or table uniquely.</b>
Basic	<b>A table or relation can contain only one primary key.</b>	<b>A table or relation can have more than one candidate key.</b>
NULL	<b>Any column of a primary key cannot be NULL.</b>	<b>The column of a candidate can contain a NULL value.</b>
Objective	<b>It is the essential part of a table or relation.</b>	<b>It signifies which key can be used as a primary key.</b>
Use	<b>It can be used as a candidate key.</b>	<b>It may or may not be used as a primary key.</b>
Specify	<b>It is not mandatory to specify a primary key for any relation.</b>	<b>There cannot be a relationship without specifying the candidate key.</b>
Example	<b>Consider a table "student" with columns (roll_no., name, class, DOB, email, mobile). Here roll_no column can be a primary key for the relationship because it identifies the student's records uniquely.</b>	<b>The roll_no, mobile, and email columns can be candidate keys in the given table because they can uniquely identify student's records.</b>

### 16. Interpreter Vs Compiler

Interpreter	Compiler
<b>Interpreter translates just one statement of the program at a time into machine code.</b>	<b>Compiler scans the entire program and translates the whole of it into machine code at once.</b>
<b>An interpreter takes very less time to analyze the source code. However, the overall time to execute the process is much slower.</b>	<b>A compiler takes a lot of time to analyze the source code. However, the overall time taken to execute the process is much faster.</b>
<b>An interpreter does not generate an intermediary code. Hence, an interpreter is highly efficient in terms of its memory.</b>	<b>A compiler always generates an intermediary object code. It will need further linking. Hence more memory is needed.</b>
<b>Keeps translating the program continuously till the first error is confronted. If any error is spotted, it stops working and hence debugging becomes easy.</b>	<b>A compiler generates the error message only after it scans the complete program and hence debugging is relatively harder while working with a compiler.</b>
<b>Interpreters are used by programming languages like Ruby and Python for example.</b>	<b>Compilers are used by programming languages like C and C++ for example.</b>

## 17. HDD Vs SSD

Basis	HDD	SSD
Stands for	Hard Disk Drive	Solid State Drive
Speed	HDD has higher latency, longer read/write times, and supports fewer IOPs (input output operations per second) compared to SSD.	SSD has lower latency, faster read/writes, and supports more IOPs (input output operations per second) compared to HDD.
Heat, Electricity, Noise	Hard disk drives use more electricity to rotate the platters, generating heat and noise.	Since no such rotation is needed in solid state drives, they use less power and do not generate heat or noise.
Defragmentation	The performance of HDD drives worsens due to fragmentation; therefore, they need to be periodically defragmented.	SSD drive performance is not impacted by fragmentation. So defragmentation is not necessary.
Components	HDD contains moving parts - a motor-driven spindle that holds one or more flat circular disks (called platters) coated with a thin layer of magnetic material. Read-and-write heads are positioned on top of the disks; all this is encased in a metal cas	SSD has no moving parts; it is essentially a memory chip. It is interconnected, integrated circuits (ICs) with an interface connector. There are three basic components - controller, cache and capacitor.
Weight	HDDs are heavier than SSD drives.	SSD drives are lighter than HDD drives because they do not have the rotating disks, spindle and motor.
Dealing with vibration	The moving parts of HDDs make them susceptible to crashes and damage due to vibration.	SSD drives can withstand vibration up to 2000Hz, which is much more than HDD.

## 18. int vs long int

int	long int
The datatype int is of 32-bits.	The data type long is of 64-bits.
If counted in bytes, int is 4 bytes.	If counted in bytes, long is 8 bytes.
In Java the range of type int is -2,147,483,648 to 2,147,483,647.	In Java the range of type long is -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807.
Keyword used to declare a variable of int type is "int".	Keyword used to declare a variable of long type is "long".
Memory required to store an int variable is less as compared to long.	Memory required to store a long variable is larger as compared to int.

### 19. Internet Vs intranet Vs Extranet

<b>Point of difference</b>	<b>Internet</b>	<b>Intranet</b>	<b>Extranet</b>
<b>Accessibility of network</b>	Public	Private	Private
<b>Availability</b>	Global system.	Specific to an organization.	To share information with suppliers and vendors it makes the use of public network.
<b>Coverage</b>	All over the world.	Restricted area upto an organization.	Restricted area upto an organization and some of its stakeholders or so.
<b>Accessibility of content</b>	It is accessible to everyone connected.	It is accessible only to the members of organization.	Accessible only to the members of organization and external members with logins.
<b>No. of computers connected</b>	It is largest in number of connected devices.	The minimal number of devices are connected.	The connected devices are comparable with Intranet.
<b>Owner</b>	No one.	Single organization.	Single/ Multiple organization.
<b>Purpose of the network</b>	It's purpose is to share information throughout the world.	It's purpose is to share information throughout the organization.	It's purpose is to share information between members and external, members.
<b>Security</b>	It is dependent on the user of the device connected to network.	It is enforced via firewall.	It is enforced via firewall that separates internet and extranet.
<b>Users</b>	General public.	Employees of the organization.	Employees of the organization which are connected.
<b>Policies behind setup</b>	There is no hard and fast rule for policies.	Policies of the organization are imposed.	Policies of the organization are imposed.
<b>Maintenance</b>	It is maintained by ISP.	It is maintained by CIO. HR or communication department of an organization.	It is maintained by CIO. HR or communication department of an organization.
<b>Economical</b>	It is more economical to use.	It is less economical.	It is also less economical.
<b>Relation</b>	It is the network of networks.	It is derived from Internet.	It is derived from Intranet.
<b>Example</b>	What we are normally using is internet.	WIPRO using internal network for its business operations.	DELL and Intel using network for its business operations

## 20. DBMS Vs File System

File System	DBMS
A file system is a software that manages and organizes the files in a storage medium. It controls how data is stored and retrieved.	DBMS or Database Management System is a software application. It is used for accessing, creating, and managing databases.
The file system provides the details of data representation and storage of data.	DBMS gives an abstract view of data that hides the details
Storing and retrieving of data can't be done efficiently in a file system.	DBMS is efficient to use as there are a wide variety of methods to store and retrieve data.
It does not offer data recovery processes.	There is a backup recovery for data in DBMS.
The file system doesn't have a crash recovery mechanism.	DBMS provides a crash recovery mechanism
Protecting a file system is very difficult.	DBMS offers good protection mechanism.
In a file management system, the redundancy of data is greater.	The redundancy of data is low in the DBMS system.
Data inconsistency is higher in the file system.	Data inconsistency is low in a database management system.
The file system offers lesser security.	Database Management System offers high security.
File System allows you to stores the data as isolated data files and entities.	Database Management System stores data as well as defined constraints and interrelation.
Not provide support for complicated transactions.	Easy to implement complicated transactions.
The centralization process is hard in File Management System.	Centralization is easy to achieve in the DBMS system.
It doesn't offer backup and recovery of data if it is lost.	DBMS system provides backup and recovery of data even if it is lost.
There is no efficient query processing in the file system.	You can easily query data in a database using the SQL language.
These system doesn't offer concurrency.	DBMS system provides a concurrency facility.

## 21. Array Vs Structure

<b>ARRAY</b>	<b>STRUCTURE</b>
<b>Array refers to a collection consisting of elements of homogeneous data type.</b>	<b>Structure refers to a collection consisting of elements of heterogeneous data type.</b>
<b>Array uses subscripts or “[ ]” (square bracket) for element access</b>	<b>Structure uses “.” (Dot operator) for element access</b>
<b>Array is pointer as it points to the first element of the collection.</b>	<b>Structure is not a pointer</b>
<b>Instantiation of Array objects is not possible.</b>	<b>Instantiation of Structure objects is possible.</b>
<b>Array size is fixed and is basically the number of elements multiplied by the size of an element.</b>	<b>Structure size is not fixed as each element of Structure can be of different type and size.</b>
<b>Bit filed is not possible in an Array.</b>	<b>Bit filed is possible in an Structure.</b>
<b>Array declaration is done simply using [] and not any keyword.</b>	<b>Structure declaration is done with the help of “struct” keyword.</b>
<b>Arrays is a non-primitive datatype</b>	<b>Structure is a user-defined datatype.</b>
<b>Array traversal and searching is easy and fast.</b>	<b>Structure traversal and searching is complex and slow.</b>
<b>data_type array_name[size];</b>	<b>struct struct_name{ data_type1 ele1; data_type2 ele2; };</b>
<b>Array elements are stored in continuous memory locations.</b>	<b>Structure elements may or may not be stored in a continuous memory location.</b>
<b>Array elements are accessed by their index number using subscripts.</b>	<b>Structure elements are accessed by their names using dot operator.</b>

## 22. Supervised Vs Unsupervised Learning

Parameters	Supervised machine learning technique	Unsupervised machine learning technique
Process	In a supervised learning model, input and output variables will be given.	In unsupervised learning model, only input data will be given
Input Data	Algorithms are trained using labeled data.	Algorithms are used against data which is not labeled
Algorithms Used	Support vector machine, Neural network, Linear and logistics regression, random forest, and Classification trees.	Unsupervised algorithms can be divided into different categories: like Cluster algorithms, K-means, Hierarchical clustering, etc.
Computational Complexity	Supervised learning is a simpler method.	Unsupervised learning is computationally complex
Use of Data	Supervised learning model uses training data to learn a link between the input and the outputs.	Unsupervised learning does not use output data.
Accuracy of Results	Highly accurate and trustworthy method.	Less accurate and trustworthy method.
Real Time Learning	Learning method takes place offline.	Learning method takes place in real time.
Number of Classes	Number of classes is known.	Number of classes is not known.
Main Drawback	Classifying big data can be a real challenge in Supervised Learning.	You cannot get precise information regarding data sorting, and the output as data used in unsupervised learning is labeled and not known.

### 23. AI Vs ML

Artificial Intelligence	Machine learning
Artificial intelligence is a technology which enables a machine to simulate human behavior.	Machine learning is a subset of AI which allows a machine to automatically learn from past data without programming explicitly.
The goal of AI is to make a smart computer system like humans to solve complex problems.	The goal of ML is to allow machines to learn from data so that they can give accurate output.
In AI, we make intelligent systems to perform any task like a human.	In ML, we teach machines with data to perform a particular task and give an accurate result.
Machine learning and deep learning are the two main subsets of AI.	Deep learning is a main subset of machine learning.
AI has a very wide range of scope.	Machine learning has a limited scope.
AI is working to create an intelligent system which can perform various complex tasks.	Machine learning is working to create machines that can perform only those specific tasks for which they are trained.
AI system is concerned about maximizing the chances of success.	Machine learning is mainly concerned about accuracy and patterns.
The main applications of AI are Siri, customer support using chatbots, Expert System, Online game playing, intelligent humanoid robot, etc.	The main applications of machine learning are Online recommender system, Google search algorithms, Facebook auto friend tagging suggestions, etc.
On the basis of capabilities, AI can be divided into three types, which are, Weak AI, General AI, and Strong AI.	Machine learning can also be divided into mainly three types that are Supervised learning, Unsupervised learning, and Reinforcement learning.
It includes learning, reasoning, and self-correction.	It includes learning and self-correction when introduced with new data.
AI completely deals with Structured, semi-structured, and unstructured data.	Machine learning deals with Structured and semi-structured data.

#### 24. Primary Vs Foreign Key

<b>PRIMARY KEY</b>	<b>FOREIGN KEY</b>
A primary key is used to ensure data in the specific column is unique.	A foreign key is a column or group of columns in a relational database table that provides a link between data in two tables.
It uniquely identifies a record in the relational database table.	It refers to the field in a table which is the primary key of another table.
Only one primary key is allowed in a table.	Whereas more than one foreign key are allowed in a table.
It is a combination of UNIQUE and Not Null constraints.	It can contain duplicate values and a table in a relational database.
It does not allow NULL values.	It can also contain NULL values.
Its value cannot be deleted from the parent table.	Its value can be deleted from the child table.
It constraint can be implicitly defined on the temporary tables.	It constraint cannot be defined on the local or global temporary tables.

#### 25. High Level Vs Low Level Language

<b>High Level Language</b>	<b>Low Level Language</b>
It is programmer friendly language.	It is a machine friendly language.
High level language is less memory efficient.	Low level language is high memory efficient.
It is easy to understand.	It is tough to understand.
It is simple to debug.	It is complex to debug comparatively.
It is simple to maintain.	It is complex to maintain comparatively.
It is portable.	It is non-portable.
It can run on any platform.	It is machine-dependent.
It needs compiler or interpreter for translation.	It needs assembler for translation.
It is used widely for programming.	It is not commonly used now-a-days in programming

## 26. IPv4 Vs IPv6

IPv4	IPv6
<b>IPv4 has a 32-bit address length</b>	<b>IPv6 has a 128-bit address length</b>
<b>It Supports Manual and DHCP address configuration</b>	<b>It supports Auto and renumbering address configuration</b>
<b>It can generate <math>4.29 \times 10^9</math> address space</b>	<b>Address space of IPv6 is quite large it can produce <math>3.4 \times 10^{38}</math> address space</b>
<b>The Security feature is dependent on application</b>	<b>IPSEC is an inbuilt security feature in the IPv6 protocol</b>
<b>Address representation of IPv4 is in decimal</b>	<b>Address Representation of IPv6 is in hexadecimal</b>
<b>In IPv4 Packet flow identification is not available</b>	<b>In IPv6 packet flow identification are Available and uses the flow label field in the header</b>
<b>It has broadcast Message Transmission Scheme</b>	<b>In IPv6 multicast and anycast message transmission scheme is available</b>
<b>In IPv4 Encryption and Authentication facility not provided</b>	<b>In IPv6 Encryption and Authentication are provided</b>

## 27. http VS https?

Parameter	HTTP	HTTPS
<b>Protocol</b>	<b>It is hypertext transfer protocol.</b>	<b>It is hypertext transfer protocol with secure.</b>
<b>Security</b>	<b>It is less secure as the data can be vulnerable to hackers.</b>	<b>It is designed to prevent hackers from accessing critical information. It is secure against such attacks.</b>
<b>Port</b>	<b>It uses port 80 by default</b>	<b>It uses port 443 by default.</b>
<b>Used for</b>	<b>It's a good fit for websites designed for information consumption like blogs.</b>	<b>If the website needs to collect the private information such as credit card number, then it is a more secure protocol.</b>
<b>Scrambling</b>	<b>HTTP does not scramble the data to be transmitted. That's why there is a higher chance that transmitted information is available to hackers.</b>	<b>HTTPS scrambles the data before transmission. At the receiver end, it descrambles to recover the original data. Therefore, the transmitted information is secure which can't be hacked.</b>
<b>Domain Name Validation</b>	<b>HTTP website do not need SSL.</b>	<b>HTTPS requires SSL certificate.</b>
<b>Search Ranking</b>	<b>HTTP does not improve search rankings.</b>	<b>HTTPS helps to improve search ranking.</b>

## 28. Array Vs Linked List

Array	Linked list
An array is a collection of elements of a similar data type.	A linked list is a collection of objects known as a node where node consists of two parts, i.e., data and address.
Array elements store in a contiguous memory location.	Linked list elements can be stored anywhere in the memory or randomly stored.
Array works with a static memory. Here static memory means that the memory size is fixed and cannot be changed at the run time.	The Linked list works with dynamic memory. Here, dynamic memory means that the memory size can be changed at the run time according to our requirements.
Array elements are independent of each other.	Linked list elements are dependent on each other. As each node contains the address of the next node so to access the next node, we need to access its previous node.
Array takes more time while performing any operation like insertion, deletion, etc.	Linked list takes less time while performing any operation like insertion, deletion, etc.
Accessing any element in an array is faster as the element in an array can be directly accessed through the index.	Accessing an element in a linked list is slower as it starts traversing from the first element of the linked list.
In the case of an array, memory is allocated at compile-time.	In the case of a linked list, memory is allocated at run time.
Memory utilization is inefficient in the array. For example, if the size of the array is 6, and array consists of 3 elements only then the rest of the space will be unused.	Memory utilization is efficient in the case of a linked list as the memory can be allocated or deallocated at the run time according to our requirement.

## 29. Static VS Dynamic Website

Static Website	Dynamic Website
<b>Content of Web pages cannot be change at runtime.</b>	<b>Content of Web pages can be changed.</b>
<b>No interaction with database possible.</b>	<b>Interaction with database is possible</b>
<b>It is faster to load as compared to dynamic website.</b>	<b>It is slower than static website.</b>
<b>Cheaper Development costs.</b>	<b>More Development costs.</b>
<b>No feature of Content Management.</b>	<b>Feature of Content Management System.</b>
<b>HTML, CSS, Javascript is used for developing the website.</b>	<b>Server side languages such as PHP, Node.js are used.</b>
<b>Same content is delivered everytime the page is loaded.</b>	<b>Content may change everytime the page is loaded.</b>

## 30. Client side VS Server-side scripting?

Client side scripting	Server side scripting
<b>Source code is visible to user.</b>	<b>Source code is not visible to user because it's output of server side is a HTML page.</b>
<b>It usually depends on browser and it's version.</b>	<b>In this any server side technology can be use and it does not depend on client.</b>
<b>It runs on user's computer.</b>	<b>It runs on web server.</b>
<b>There are many advantages link with this like faster response times, a more interactive application.</b>	<b>The primary advantage is it's ability to highly customize, response requirements, access rights based on user.</b>
<b>It does not provide security for data.</b>	<b>It provides more security for data.</b>
<b>It is a technique use in web development in which scripts runs on clients browser.</b>	<b>It is a technique that uses scripts on web server to produce a response that is customized for each clients request.</b>
<b>HTML, CSS and javascript are used.</b>	<b>PHP, Python, Java, Ruby are used.</b>

### 31. get VS post method

Basis	Get	Post
History	Parameters remain in browser history because they are part of the URL	Parameters are not saved in browser history.
Bookmarked	Can be bookmarked.	Cannot be bookmarked.
BACK button/re-submit behaviour	GET requests are re-executed but may not be re-submitted to server if the HTML is stored in the browser cache.	The browser usually alerts the user that <u>data</u> will need to be re-submitted.
Parameters	can send but the parameter data is limited to what we can stuff into the request line (URL). Safest to use less than 2K of parameters, some servers handle up to 64K	Can send parameters, including uploading files, to the server.
Hacked	Easier to hack for script kiddies	More difficult to hack
Restrictions on form data type	Yes, only ASCII characters allowed.	No restrictions. Binary data is also allowed.
Security	GET is less secure compared to POST because data sent is part of the URL. So it's saved in browser history and server logs in plaintext.	POST is a little safer than GET because the parameters are not stored in browser history or in <u>web server</u> logs.
Usability	GET method should not be used when sending passwords or other sensitive information.	POST method used when sending passwords or other sensitive information.
Visibility	GET method is visible to everyone (it will be displayed in the browser's address bar) and has limits on the amount of information to send.	POST method variables are not displayed in the URL.

### 32. programming VS scripting languages?

Programming Language	Scripting Language
A programming language is a computer language that is used to communicate with computers using a set of instructions.	A scripting language is a type of programming language designed for a runtime system to automate the execution of tasks.
It is compiled language or compiler-based language.	It is interpreted language or interpreter-based language
It is used to develop an application or software from scratch.	It is used to combine existing components and automate a specific task.
It runs or executes independently and does not depend on the parent (exterior) program.	It runs or executes inside another program.
It uses a compiler to convert source code into machine code.	It uses an interpreter to convert source code into machine code.
As it uses a compiler, hence the complete program is converted into machine code in one shot.	As it uses an interpreter, hence the program is converted into machine code line by line.
These languages are required to be compiled.	There is no need for compilation.
It is comparatively difficult to write code in a programming language, and it requires numerous lines of code for each task.	It is comparatively easy to write code in the scripting language, and it requires few lines of code for each task.
The development time in programming languages is high as more lines are required.	The development time in a scripting language as a smaller number of lines are required.
There is the high maintenance cost.	There is less maintenance cost.
All programming languages are not scripting languages	All scripting languages are programming languages
It generates a .exe file.	It does not create a .exe file.
Usually, programming languages do not support or provide very little support for user interface designing, data types, and graphic designing.	Scripting languages provide great support to user interface design, data types, and graphic design.
Some popular examples are C, C++, Java, Scala, COBOL, etc.	Some popular examples are Perl, Python, JavaScript, etc.

### 33. Call by Value Vs Call by Reference?

No.	Call by value	Call by reference
1	A copy of the value is passed into the function	An address of value is passed into the function
2	Changes made inside the function is limited to the function only. The values of the actual parameters do not change by changing the formal parameters.	Changes made inside the function validate outside of the function also. The values of the actual parameters do change by changing the formal parameters.
3	Actual and formal arguments are created at the different memory location	Actual and formal arguments are created at the same memory location

### 34. actual Vs formal parameters?

Actual Parameters	Formal Parameters
Actual Parameters used in the function call.	Formal Parameters used in the function header.
Data type not required.	Data type define must be required.
Parameters can be constant values or variable names.	Parameters can be handle as local variables.
Ex:- add(a,b); A and B are Actual parameters	Ex:- int add(int a,int b) {//All function code} A and B are Formal parameters

### 35. Malloc() Vs calloc()

malloc()	calloc()
Malloc() function will create a single block of memory of size specified by the user.	Calloc() function can assign multiple blocks of memory for a variable.
Malloc function contains garbage value.	The memory block allocated by a calloc function is always initialized to zero.
Number of argument is 1.	Number of arguments are 2.
Calloc is slower than malloc.	Malloc is faster than calloc.
It is not secure as compare to calloc.	It is secure to use compared to malloc.
Time efficiency is higher than calloc().	Time efficiency is lower than malloc().
Malloc() function returns only starting address and does not make it zero.	Before allocating the address, Calloc() function returns the starting address and make it zero.
It does not perform initialization of memory.	It performs memory initialization.

### 36. Memory Mapped IO Vs Isolated IO

Isolated I/O	Memory Mapped I/O
Memory and I/O have separate address space	Both have same address space
All address can be used by the memory	Due to addition of I/O addressable memory become less for memory
Separate instruction control read and write operation in I/O and Memory	Same instructions can control both I/O and Memory
In this I/O address are called ports.	Normal memory address are for both
More efficient due to separate buses	Lesser efficient
Larger in size due to more buses	Smaller in size
It is complex due to separate logic is used to control both.	Simpler logic is used as I/O is also treated as memory only.

### 37. Strong entity Vs week entity.

Strong entity	Week entity
Strong entity has a primary key.	Weak entity has a partial key.
Strong entity is independent	Weak entity is dependent on a strong entity
Strong entity indicated by a single rectangle.	Strong entity indicated by a double rectangle.
Two strong entity's relationship is indicated by a single diamond.	One strong and one weak entity is indicated by a double diamond.
Strong entity may be or may not be participate relationships.	Weak entity always participates relationships.
In strong entity connecting line is a single line	In weak entity connecting line is a double line

### 38. What are the difference between TCP and UDP?

Basis	Transmission control protocol (TCP)	User datagram protocol (UDP)
Type of Service	TCP is a connection-oriented protocol. Connection-orientation means that the communicating devices should establish a connection before transmitting data and should close the connection after transmitting the data.	UDP is the Datagram-oriented protocol. This is because there is no overhead for opening a connection, maintaining a connection, and terminating a connection. UDP is efficient for broadcast and multicast types of network transmission.
Reliability	TCP is reliable as it guarantees the delivery of data to the destination router.	The delivery of data to the destination cannot be guaranteed in UDP.
Error checking mechanism	TCP provides extensive error-checking mechanisms. It is because it provides flow control and acknowledgment of data.	UDP has only the basic error checking mechanism using checksums.
Acknowledgment	An acknowledgment segment is present.	No acknowledgment segment.
Sequence	Sequencing of data is a feature of Transmission Control Protocol (TCP). this means that packets arrive in order at the receiver.	There is no sequencing of data in UDP. If the order is required, it has to be managed by the application layer.
Speed	TCP is comparatively slower than UDP.	UDP is faster, simpler, and more efficient than TCP.
Retransmission	Retransmission of lost packets is possible in TCP, but not in UDP.	There is no retransmission of lost packets in the User Datagram Protocol (UDP).
Header Length	TCP has a (20-60) bytes variable length header.	UDP has an 8 bytes fixed-length header.
Weight	TCP is heavy-weight.	UDP is lightweight.
Handshaking Techniques	Uses handshakes such as SYN, ACK, SYN-ACK	It's a connectionless protocol i.e. No handshake
Broadcasting	TCP doesn't support Broadcasting.	UDP supports Broadcasting.
Protocols	TCP is used by HTTP, HTTPS, FTP, SMTP and Telnet.	UDP is used by DNS, DHCP, TFTP, SNMP, RIP, and VoIP.
Stream Type	The TCP connection is a byte stream.	UDP connection is message stream.
Overhead	Low but higher than UDP.	Very low.

### 39. Differentiate between Starvation and Deadlock

Features	Deadlock	Starvation
Definition	Deadlock happens when every process holds a resource and waits for another process to hold another resource.	Starvation happens when a low priority program requests a system resource but cannot run because a higher priority program has been employing that resource for a long time.
Basic	A deadlock occurs when no process can proceed and becomes blocked.	Starvation occurs when low priority procedures are blocked while high priority operations proceed.
Other names	Deadlock is also known as circular wait.	Starvation is known as a Lived lock.
Resources	Other processes block requested resources while a process is deadlocked.	High-priority processes continue to use the requested resources.
Arising Condition	Mutual exclusion's occurrence, Hold and wait, No preemption, and Circular wait all happen simultaneously.	Uncontrolled resource management, enforcement of priorities.
Prevention	It can be prevented by avoiding the situations that lead to deadlock.	Aging may prevent it.

### 40. Differentiate between RISC and SISC

RISC	CISC
<b>It is a Reduced Instruction Set Computer.</b>	<b>It is a Complex Instruction Set Computer.</b>
<b>It emphasizes on software to optimize the instruction set.</b>	<b>It emphasizes on hardware to optimize the instruction set.</b>
<b>It requires multiple register sets to store the instruction.</b>	<b>It requires a single register set to store the instruction.</b>
<b>Uses of the pipeline are simple in RISC.</b>	<b>Uses of the pipeline are difficult in CISC.</b>
<b>It uses a limited number of instruction that requires less time to execute the instructions.</b>	<b>It uses a large number of instruction that requires more time to execute the instructions.</b>
<b>The execution time of RISC is very short.</b>	<b>The execution time of CISC is longer.</b>
<b>RISC architecture can be used with high-end applications like telecommunication, image processing, video processing, etc.</b>	<b>CISC architecture can be used with low-end applications like home automation, security system, etc.</b>
<b>It has fixed format instruction.</b>	<b>It has variable format instruction.</b>
<b>The program written for RISC architecture needs to take more space in memory.</b>	<b>Program written for CISC architecture tends to take less space in memory.</b>
<b>Example of RISC: ARM, PA-RISC, Power Architecture, Alpha, AVR, ARC and the SPARC.</b>	<b>Examples of CISC: VAX, Motorola 68000 family, System/360, AMD and the Intel x86 CPUs.</b>

**41. What are the differences between compile time error and run time error?**

Parameters	Compile Time Errors	Runtime Errors
Detection	Compilers can easily detect compile-time errors during the development of code.	A compiler cannot easily detect a runtime error. Thus, we need to identify it during the execution of code.
Reference	A compile-time error generally refers to the errors that correspond to the semantics or syntax.	A runtime error refers to the error that we encounter during the code execution during runtime.
Fixation	We can easily fix a compile-time error during the development of code.	A compiler cannot identify a runtime error. But we can fix it after the execution of code and identification of the code in prior.

## **Full Forms (CSE Related Only)**

1. API	Application Programming Interface.
2. APK	Android Application Package.
3. BIOS	Basic Input Output System.
4. CSS	Cascading Style Sheet.
5. DHTML	Dynamic Hyper Text Markup Language.
6. FTP	File Transfer Protocol.
7. GPRS	General Packet Radio Service.
8. GPS	Global Positioning System.
9. GUI	Graphical User Interface.
10. GOOGLE	Global Organization Of Oriented Group Language Of Earth.
11. HTTPS	Hyper Text Transfer protocol secure
12. IBM	International Business Machines.
13. JPG	Joint Photographic Experts Group.
14. MVC	Model View Controller.
15. PDF	Portable Document Format.
16. PNG	Portable Network Graphics.
17. PHP	Hypertext Preprocessor.
18. UML	Unified Modeling Language.
19. URL	Uniform Resource Locator.
20. USB	Universal Serial Bus.
21. VGA	Video Graphics Array.
22. VIRUS	Vital Information Resources Under Seize.
23. WIFI	Wireless Fidelity.
24. XML	EXtensible Markup Language.
25. XAMPP	Cross - Platform (X), Apache (A), MariaDB (M), PHP (P) and Perl (P).
26. PROM	Programmable Read Only Memory
27. POST	Power ON Self Test
28. LCD	Liquid Crystal Display
29. SIM	Subscriber Identity Module.
30. GIF	Graphic Interchangeable Format
31. ARPANET	Advanced Research Project Agency Network.
32. FAT	FILE ALLOCATION TABLE
33. CMYK	CYAN – MAGENTA – YELLOW – KEY (BLACK)
34. ASCII	American Standard Code for Information Interchange
35. MAC	Media Access Control

<b>36. MODEM</b>	<b>Modulator Demodulator</b>
<b>37. MIDI</b>	<b>Musical Instrument Digital Interface</b>
<b>38. MIME</b>	<b>Multipurpose Internet Mail Extension</b>
<b>39. MPEG</b>	<b>Moving Picture Experts Group</b>
<b>40. NAT</b>	<b>Network Address Translation</b>
<b>41. NIC</b>	<b>Network Interface Card</b>
<b>42. NTFS</b>	<b>New Technology File System</b>
<b>43. PCI</b>	<b>Peripheral Component Interconnect</b>
<b>44. PPP</b>	<b>Point-To-Point Protocol</b>
<b>45. QoS</b>	<b>Quality Of Service</b>
<b>46. RAID</b>	<b>Redundant Array Of Inexpensive Disks</b>
<b>47. SMTP</b>	<b>Simple Mail Transport Protocol</b>
<b>48. SSL</b>	<b>Secure Sockets Layer</b>
<b>49. UART</b>	<b>Universal Asynchronous Receiver Or Transmitter</b>
<b>50. SMS</b>	<b>Short Message Service</b>
<b>51. MMS</b>	<b>Multimedia Messaging Service</b>
<b>52. ATM</b>	<b>Asynchronous Transfer Mode</b>
<b>53. CIDR</b>	<b>Classless Inter Domain Routing</b>
<b>54. CMOS</b>	<b>Complementary Metal-Oxide Semiconductor</b>
<b>55. DHCP</b>	<b>Dynamic Host Configuration Protocol</b>
<b>56. DMA</b>	<b>Direct Memory Access</b>
<b>57. DNS</b>	<b>Domain Name Service/Server/System</b>
<b>58. DOS</b>	<b>Disk operating system or Denial of Service</b>
<b>59. DTE</b>	<b>Data Terminal Equipment</b>
<b>60. GSM</b>	<b>Global System for Mobile-communications</b>
<b>61. HTML</b>	<b>Hypertext Markup Language</b>
<b>62. HTTP</b>	<b>Hypertext Transfer Protocol</b>
<b>63. PAN</b>	<b>Personal Area Network</b>
<b>64. PIN</b>	<b>Personal Identification Number</b>
<b>65. RISC</b>	<b>Reduced Instruction Set Computer</b>
<b>66. RPC</b>	<b>Remote Procedure Call</b>
<b>67. SDH</b>	<b>Synchronous Digital Hierarchy</b>
<b>68. SONET</b>	<b>Synchronous Optical Network</b>
<b>69. SQL</b>	<b>Structured Query Language</b>
<b>70. TCP/IP</b>	<b>Transmission Control Protocol/Internet Protocol</b>
<b>71. UTP</b>	<b>Unshielded Twisted Pair</b>
<b>72. VPN</b>	<b>Virtual Private Network</b>

<b>73. ALU</b>	<b>Arithmetic Logic Unit</b>
<b>74. BCD</b>	<b>Binary Coded Decimal</b>
<b>75. CAD</b>	<b>Computer Aided Design</b>
<b>76. OSI</b>	<b>Open System Interconnection</b>
<b>77. WiMAX</b>	<b>Worldwide Interoperability for Microwave Access</b>
<b>78. RUP</b>	<b>Rational Unified Process</b>
<b>79. SDLC:</b>	<b>Software Development Life Cycle</b>
<b>80. COBOL</b>	<b>Common Business Oriented Language</b>
<b>81. PROLOG</b>	<b>Programming in Logic</b>
<b>82. ORACLE</b>	<b>Oak Ridge Analytical and Common Logical Engine</b>
<b>83. DSL</b>	<b>Digital Subscribers Line</b>
<b>84. MAN</b>	<b>Metropolitan Area Network</b>
<b>85. PLA</b>	<b>Programmable Logic Array</b>
<b>86. CDMA</b>	<b>Code Division Multiple Access.</b>
<b>87. GPU</b>	<b>Graphics Processing Unit.</b>
<b>88. MSB</b>	<b>Most Significant Bit</b>
<b>89. RDBMS</b>	<b>Relational Database Management System</b>
<b>90. CPU</b>	<b>Central Processing Unit</b>
<b>91. BTRC</b>	<b>Bangladesh Telecommunication Regulatory Commission</b>
<b>92. UMTS</b>	<b>Universal Mobile Telecommunication System</b>
<b>93. AMR</b>	<b>Adaptive Multi-Rate Codec</b>
<b>94. JAD</b>	<b>Java Application Descriptor</b>
<b>95. AAC</b>	<b>Advanced Audio Coding</b>
<b>96. GIF</b>	<b>Graphic Interchangeable Format</b>
<b>97. WMV</b>	<b>Windows Media Video</b>
<b>98. DVD</b>	<b>Digital Versatile Disk</b>
<b>99. DAT</b>	<b>Digital Audio Tape</b>
<b>100. DOS</b>	<b>Disk Operating System</b>
<b>101. UPS</b>	<b>Uninterruptable Power Supply</b>
<b>102. EDGE</b>	<b>Enhanced Data for Global Evolution. (Also known as Enhanced GPRS)</b>
<b>103. GPRS</b>	<b>General Packet Radio Service</b>
<b>104. WAP</b>	<b>Wireless Application Protocol</b>
<b>105. HP</b>	<b>Hawlett Packard</b>
<b>106. WORM</b>	<b>Write Once Read Many</b>
<b>107. MBR</b>	<b>Memory Buffer Register / Master Boot Record</b>
<b>108. MIDI</b>	<b>Musical Instrument Digital Interface</b>
<b>109. MPEG</b>	<b>Moving Pictures Expert Group</b>

<b>110. NIC</b>	<b>Network Interface Card</b>
<b>111. OMR</b>	<b>Optical Mark Reader</b>
<b>112. OCR</b>	<b>Optical Character Reader/Recognition</b>
<b>113. TCP</b>	<b>Transmission Control Protocol</b>
<b>114. UDP</b>	<b>User Datagram Protocol</b>
<b>115. TDM</b>	<b>Time Division Multiplexing</b>
<b>116. URL</b>	<b>Uniform Resource Locator</b>
<b>117. VAN</b>	<b>Value Added Network</b>
<b>118. VCR</b>	<b>Video Cassette Recorder</b>
<b>119. VGA</b>	<b>Video Graphics Array</b>
<b>120. VoIP</b>	<b>Voice over Internet Protocol</b>
<b>121. VSAT</b>	<b>Very Small Aperture Terminal</b>
<b>122. FAT</b>	<b>File Allocation Table</b>
<b>123. FDM</b>	<b>Frequency Division Multiplexing</b>
<b>124. JRE</b>	<b>Java Runtime Engine</b>
<b>125. URI</b>	<b>Uniform Resource Identifier</b>
<b>126. BCD</b>	<b>Binary Coded Decimal</b>
<b>127. CAD</b>	<b>Computer Aided Design</b>
<b>128. CLI</b>	<b>Command Line Interface</b>
<b>129. CRT</b>	<b>Cathode Ray Tube</b>
<b>130. DDL</b>	<b>Data Definition Language</b>
<b>131. IMAP</b>	<b>Internet Message Access Protocol</b>
<b>132. PLA</b>	<b>Programmable Logic Array</b>
<b>133. FPGA</b>	<b>Field Programmable Gate Array</b>
<b>134. CISC</b>	<b>Complex Instruction Set Computer</b>
<b>135. MAR</b>	<b>Memory address register</b>
<b>136. MOM</b>	<b>Message oriented middleware</b>



**EMCS Program**  
**Admission Test Summer 2013**  
Department of Computer Science and Engineering  
Jagangirnagar University

Signature of Incharge

Name: \_\_\_\_\_ Student ID: \_\_\_\_\_

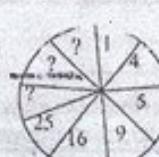
Full Marks: 50

Date: 26-04-2013

Time: 1 hour

Answer all of the following according to the instruction of each question. Encircle the correct answer in case of multiple choice questions.

1. Physical transmission medium lies in \_\_\_\_\_ layer of OSI reference model.  
A. Physical Layer    B. Network Layer  
C. Session    D. None
2. Which technique is preferable for huge data transfer between I/O and memory?  
A. Memory Mapped I/O    B. Isolated I/O  
C. Interrupt I/O    D. DMA
3. Arithmetic and geometric mean of X and Y will be the same if  
A.  $X = Y$     B.  $X = \sqrt{Y}$   
C.  $X = \sqrt[3]{Y}$     D.  $X = \sqrt[4]{Y}$
4. If the eccentricity of a circle, ellipse and parabola are  $e_1, e_2, e_3$  then which one is true?  
A.  $e_1 < e_2 < e_3$     B.  $e_1 > e_2 > e_3$   
C.  $e_2 > e_3 > e_1$     D.  $e_1 > e_3 > e_2$
5. Determine the missing terms of the triangular matrix.
- |    |    |     |    |   |
|----|----|-----|----|---|
| 12 | 7  | 9   | 18 | 6 |
| 5  | -2 | 0   | 12 |   |
| 7  | 7  | -21 |    |   |
| 0  | ?  |     |    |   |
| ?  |    |     |    |   |
6. Mr. Karim earns  $x$  taka in 3 months and expends the same amount in 4 months. How much he saves in a year?  
A. He has no savings    B.  $3x$  taka  
C.  $x$  taka    D.  $4x$  taka
7. Fill in the blank:  
Take \_\_\_\_\_ what I say.  
A. Off    B. Up  
C. On    D. Down
8. Differentiation of  $\log_e 'x'$  is .....
9. Elaboration of POST is .....
10. What will be the mass of an object traveling with the speed of light?
11. Expand the term *http*.
12. An optical drive uses the ..... to read data.  
A. Magnetize particle    B. Electric particle  
C. Reflected light    D. Refracted light
13. If  $a < b$  then  $Q(a, b) = 0$  otherwise  $Q(a, b) = Q(a-b, b) + 1$ . Find  $Q(12, 5)$ .
14. Find the next two elements of the following series: 0, 1, 1, 2, 3, 5 ...
15. Write the full form of WiMAX
16. In the fig shown, if  $CP=BP$  and  $x=120^\circ$ , then  $y=$ ?
- A.  $30^\circ$     B.  $45^\circ$   
C.  $60^\circ$     D.  $90^\circ$
17.  $3^1+3^2+3^3=?$   
A.  $9^4$     B.  $3^{1+2+3}$   
C.  $9^{3^2}$     D.  $3^{3^3}$
18. If  $p$  and  $q$  are prime numbers, how many divisors does the product  $p^3 q^6$  have?  
A. 9    B. 28  
C. 18    D. 12
19. What social networking website started out as a band promotion service?  
A. Facebook    B. MySpace  
C. LinkedIn    D. Twitter
20. Which of the following terms does not describe a type of flash drive?  
A. Hard Drive    B. Pen Drive  
C. Jump Drive    D. Thumb Drive

21. What type of RAM is most often used for system memory?  
 A. SRAM      B. PRAM  
 C. SDRAM      D. VRAM
22. Where the mass of an object is zero?
23. Why a bullet is stopped after traversing a distance?
24. Who is titled as "IRON LADY" of Britain?
25. How the measurement of a monitor/ TV is performed?
26. Which one is a volatile memory?  
 A. RAM      B. ROM  
 C. Hard disk      D. CD
27. Which one of the following words is synonym of "inhibit"?  
 A. Protect      B. Hinder  
 C. Improvise      D. Concur
28. If the side of a square is increased by a 20% then its area increased by  
 A. 40%      B. 44%  
 C. 30%      D. None
29. If the perimeter of the outer circle is  $2\pi R$  and inner circle is  $2\pi r$  where  $R > r$ . Consider the center of two circles is at the same point. What is the area of the intermediate region?  
 A.  $\pi (R^2 - r^2)$       B.  $2\pi r (2R + r)$   
 C.  $2\pi r (R+r)$       D.  $\pi (R^2 + r^2)$
30. What is IT?  
 A. Store, retrieve, represent and manipulate data      B. Store, retrieve and manipulate data.  
 C. Store, retrieve, transmit and manipulate data      D. None
31. Which of the following is not an application software?  
 A. Oracle      B. BIOS  
 C. Adobe      D. Excel
32. IPv4 address is represented in dotted decimal notation using...  
 A. 132 bit      B. 64 bit  
 C. 32 bit      D. None
33. Taking each of the digit 4, 3, 0, 1 only once, how many numbers of four digit can be formed?  
 A. 18      B. 12  
 C. 48      D. 24
34. The average of a, b and c is 6;  $a+b = 4$  and  $ab = 21$ . What is the value of c?  
 A. 2      B. 7  
 C. 3      D. None
35. Hub falls in \_\_\_\_\_ layer and Bridge falls in \_\_\_\_\_ layer.
36. MP3G is compressed form of \_\_\_\_\_ file.  
 A. Audio      B. Video  
 C. Text file      D. A and B
37. Fill up the "?" cell.
- 
38. FLOPS used to measure \_\_\_\_\_?  
 A. Storage Capacity      B. Processor Speed  
 C. Data Transfer Rates      D. Network Bandwidth
39. The arithmetic mean of 3, 6, 10, m and n is 9, then what is the average of m + 4 and n - 2?  
 A. 9      B. 13  
 C. 14      D. 18
40. He is blind \_\_\_\_\_ the system fault.  
 A. of      B. to  
 C. in      D. from
41. Each pixel of a grayscale image is represented by \_\_\_\_\_ bits and that of RGB case is \_\_\_\_\_ bits.
42. Smallest unit of information is \_\_\_\_\_.
43. Voice/Video in a network is \_\_\_\_\_ traffic.
44. Operating system provides interface between \_\_\_\_\_ and \_\_\_\_\_.
45. GSM is \_\_\_\_\_ generation and UMTS-2000 is \_\_\_\_\_ generation technology.
46. Mughal emperor Shahjahan is the son of \_\_\_\_\_ and grandson of \_\_\_\_\_.
47. The furthest planet of solar system is \_\_\_\_\_.
48. Einstein awarded the Nobel Prize for discovering \_\_\_\_\_.
49. LED converts \_\_\_\_\_ signal to \_\_\_\_\_ signal.
50. The fundamental colors used in TV/monitor are \_\_\_\_\_ and \_\_\_\_\_.

# Set-B

	<b>DEPARTMENT OF COMPUTER SCIENCE &amp; ENGINEERING JAHNAGIRNAGAR UNIVERSITY EMCS Program</b> <i>Admission Test Spring 2014</i>	Signature of the Invigilator     Time : 1 Hour Marks: 50
Applicant's Name: ..... Roll: .....		

*Answer the following questions according to the instructions. Put a tick mark on the correct answer for multiple choice questions and fill in the blanks where applicable.*

1. Outsourcing involves
 

a) In-house software development	b) Software Import
c) Software export	d) Third party software development
  2. Light propagates through an optical fiber because of
 

a) Total internal reflection	b) Refraction of light through core
c) Diffraction of light	d) Scattering of light
  3. Which of the following programming language use interpreter instead of compiler?
 

a) MATLAB	b) PROLOG
c) C	d) FORTRAN
  4. Which of the following characteristics is not in connection with RAM?
 

a) non-volatile	b) stores data
c) store instructions	d) volatile
  5. The unit of bandwidth in data communication is \_\_\_\_\_ and the unit of storage capacity of a memory is \_\_\_\_\_.
  6. If the arithmetic- and geometric-mean of two numbers are equal and the one is 10 then the another will be
 

a) 10	b) 4
c) $\sqrt{4}$	d) $4^2$
  7. What is the value returned by the function call: Fun(2)? Ans: 5
 

```
int Fun(int n){  
    if(n == 4)  
        return 2;  
    else  
        return 2 * n + 1;  
}
```
  8. Write down the appropriate number in the missing section of the circle.  
Ans:
- 
- 20
9. All good comic writers use humor to \_\_\_\_\_, not to side-step the problems of human behavior.
 

a) amuse	b) avert
c) confront	d) solve
  10. It is refreshing to read a book about our planet by an author who does not allow facts to be \_\_\_\_\_ by politics.
 

a) overshadowed	b) invalidated
c) illuminated	d) obscured
  11. At the end of a banquet 10 people shake hands with each other. How many handshakes will there be in total?
 

a) 100	b) 20
c) 45	d) 50
  12. Which one of the following devices is used to connect different types of networks?
 

a) Hub	b) Switch
c) Gateway	d) Router
  13. Which one is a DBMS tool?
 

a) COBOL	b) Java
c) Oracle	d) Pro-B
  14. If  $\log_2 324 = 4$ , then  $x = ?$ 

a) 6	b) 4
c) $4\sqrt{2}$	d) $3\sqrt{2}$
  15. The train is \_\_\_\_\_ to start.
 

a) on	b) at
c) about	d) nearer
  16. Two sides of a triangular field are of the same length 13ft. Third side is 10 ft in length. Find the area of the field in square feet?
 

a) 60	b) 65
c) 30	d) 50
  17. Which one of the following is a popular mobile phone's operating system for mobile application software development?
 

a) UNIX	b) Windows XP
c) Android	d) Sun Solaris

27. Who introduced the "stored program" concept?  
 (a) Dr. John Von Neumann (b) Charles Babbage  
 (c) Blaise Pascal (d) Herman Hollerith
28. Which of the following cables is widely used in LAN?  
 (a) Twisted pair (b) Co-axial (c) Fiber optic (d) None
29. Which of the following does the interface between a process and the operating system?  
 (a) Procedure call (b) System call  
 (c) Function call (d) Kernel
30. Which one is the arithmetic mean?  
 (a)  $\bar{X} = \frac{\sum f_i d_i}{\sum f_i}$  (b)  $\bar{X} = A + \frac{\sum f_i d_i}{\sum f_i} \times c$   
 (c)  $\bar{X} = \frac{(l_1 - l_0)}{f} (m - c)$  (d) none of them
- GROUP-B:** Answer the following questions shortly. Each question carries 2 (two) points.
31. Define the terms: (i) Interpreter (ii) Compiler
32. What are the functions of operating system?
33. Write down the basic structure of SOL.
34. Find the number  $n$  of committees of 5 with a given chairperson that can be selected from 12 people.
35. Prove that,  $A = \overline{A}B + A + B$  where A and B are Boolean variables.
36. Rewrite the following C program using do-while loop.
- ```
#include <stdio.h>
main()
{
    int count;
    count=0;
    while (count < 100)
    {
        count++;
        printf("Hello World\n");
    }
}
```
37. What you will see if you run the following codes:
- ```
#include <stdio.h>
int main(void)
{
    int first=15, second=10, sum;
    printf("Enter two integers > ");
    scanf("%d %d", &first, &second);
    printf("The two numbers are: %d %d\n", first, second);
    sum=first+second;
    printf("Their sum is %d\n", sum);
}
```
38. Evaluate:  

$$\int_{0}^{\pi} \sin x \cos^2 x dx$$
39. If  $y=e^{x \log x}$ , Find  $dy/dx$  at  $x=1$ .
40. Draw a flowchart to find out the smallest number from three integers.

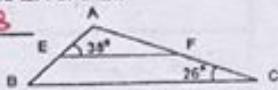
	<b>DEPARTMENT OF COMPUTER SCIENCE &amp; ENGINEERING</b> Jahnagirnagar University <b>EMCS Program</b> <b>Admission Test Summer 2014</b>	Signature of the Invigilator    Time : 1 Hour Marks: 50
Applicant's Name: ..... Roll No.: .....		

**GROUP A:** Put a tick mark (✓) on the correct answer for multiple choice questions (MCQ) and fill in the blank where applicable. Each question carries 1 (one) point.

- Multiple Choice Questions (MCQ) are evaluated by:
1. (a) OCR    (b) OMR    (c) MICR    (d) Plotter
  2. Which part of the computer performs logical operations?  
 (a) ROM    (b) Control Unit    (c) ALU    (d) RAM
  3. Which of the following methods is involved in data transmission between Keyboard and CPU?  
 (a) Simplex (b) Duplex (c) Half duplex (d) None of them
  4. Database is a –  
 (a) collection of files    (b) collection of data  
 (c) collection of interrelated data    (d) all of them
  5. An entity is a/an –  
 (a) collection of items in an application  
 (b) Inanimate object in an application  
 (c) distinct real world item in an application  
 (d) data structure
  6. A distributed database has which of the following advantages over a centralized database?  
 (a) Software cost    (b) Software complexity  
 (c) Slow Response    (d) Modular growth
  7. Which of the following is a method of transferring money from one person's account to another?  
 (a) electronic check    (b) credit card  
 (c) e-transfer    (d) none of the above
  8. Which of the following describes E-commerce?  
 (a) Buying products from each other  
 (b) Buying services from each other  
 (c) Selling services from each other  
 (d) All of the above
  9. Rearrange the following letters to make a word and choose the category in which it fits: MENMYSINGH *mymensingh*  
 (a) city    (b) fruit    (c) bird    (d) vegetable
  10. The speed of supercomputer is generally measured in -----.
  11. C language was originally developed by:  
 (a) Babbage (b) Denis Ritchie (c) Neumann (d) Ada
  12. The common fields of an instruction are ----- and -----.
  13. What will be the next two numbers in the following series?  
 4, 10, 5, 12, 6, 14, 7, 16.
  14. HTML is simple and easy. Why is it not used more often in programming?  
 (a) its monetary expense outweighs its benefits.  
 (b) it cannot handle the high volume and complexity of business transactions.  
 (c) inherent deficiencies in the language cause computers using it to fail ("crash").  
 (d) all of the above
  15. XML makes it easier for:  
 (a) humans to read web sites  
 (b) machines to read web sites.  
 (c) both of the above.  
 (d) neither of the above.
  16. Which of the following are methods or means of safeguarding computer systems?  
 (a) physical traits of users    (b) worms  
 (c) password    (d) a and c
  17. Which one is more faster on the basis of data access and retrieval time?  
 (a) flash memory    (b) cache memory  
 (c) blue ray device    (d) hard disk
  18. Which type of network topology is usually used?  
 (a) bus topology    (b) star topology  
 (c) ring topology    (d) hard disk
  19. What output you will get from the following program?  

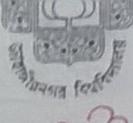
```
void main()
{
float f;
f=4/5+9%4;
printf("% .2f", f);
}
(a) 1.80    (b) 1.00    (c) 0.00    (d) 3.05
```
  20. Semantic error occurs due to:  
 (a) Incorrect syntax (b) incorrect logic  
 (c) Wrong input    (d) none of them
  21. Which of the following is used to answer a question about a database?  
 (a) Query (b) Table (c) Report (d) Form
  22. The function of a DNS server to convert domain name to IP address.  
 (a) Web address & DNS    (b) Email address & DNS  
 (c) MAC address & IP    (d) DNS and IP
  23. Active HUB is under \_\_\_\_\_ layer but passive HUB is under \_\_\_\_\_ layer of OSI model.  
 (a) Data link and Network    (b) Physical and Data link  
 (c) Physical and zero    (d) Network and Transport
  24. Which one of the following is not a keyword in C?  
 (a) while    (b) name  
 (c) default    (d) sizeof
  25. Metadata means –  
 (a) data that describes other data (b) unused data  
 (c) data used as metaphor (d) frequently accessed data
  26. A = {2,3,4}. What is the cardinality of set A?  
 (a) 2    (b) 3    (c) 8    (d) 24

$$\begin{array}{r} 36 \\ 26 \\ \hline 62 \end{array} \quad \begin{array}{r} 180 \\ 62 \\ \hline 118 \checkmark \end{array}$$

18. The corporation expects only \_\_\_\_\_ increases in sales next year despite a year-long effort to revive its retailing business.  
 a) dynamic      b) predictable  
 c) expanding     d) slight
19. Who is the Inventor of facebook?  
 Ans: *Mark Zuckerberg*
20. How many bits are used in IPv6 address?  
 Ans:
21. Polished data is known as \_\_\_\_\_
22. In a relational database a common \_\_\_\_\_ existing in any two tables creates a relationship between them.
23. The total age of Lamirho and Irisha is 10. If Lamira is 2 years older than Irisha and Suzana is 2 years younger than Irisha, then the age of Suzana is  
 a) 1 year      b) 2 years  
 c) 4 years      d) 5 years
24. If the integer  $a$  is even and  $b$  is odd, then  $(a+b)^2$  is odd or even? Ans:
25. Write the equivalent C/C++ expression for the expression:  $y=10e^x+3\sin(3x)$ .  
 Ans:
26. Einstein was awarded Nobel prize for contributing to  
 a) Photoelectric effect      b) Cosmology  
 c) Relativity      d) Microelectronics
27. The area under a curve is determined by \_\_\_\_\_
28. The synonym of the word Giant is:  
 a) Colossal      b) Monster  
 c) enormous      d) all of them
29. Evaluate  $\int \frac{1}{x} \ln x dx$       Ans:
30. VSAT stands for \_\_\_\_\_
31. Which one indicates lowest boundary of complexity between Big O and Big Omega?  
 Ans:
32. What is the decimal equivalent of the binary number 110001? Ans:
33. Which one has the highest complexity?  
 a) Constant      b)  $n$   
 c)  $n^2$       d)  $n!$
34. A group of 4 bits is called  
 a) byte      b) nibble  
 c) word      d) none of them.
35. Which one is platform independent programming language?  
 a) JAVA      b) BASIC  
 c) C++      d) FORTRAN
36. In  $\triangle ABC$ ,  $E$  is on  $BC$ . Find  $\angle A$  and  $\angle B$ .  
 Ans: 118 and 38
- 
37. Which one of the following C++ expressions does not always correctly compute the mathematical average of the integer variables  $a$ ,  $b$ ,  $c$ , and  $d$ ?  
 a)  $\text{float}((a+b+c+d)/4.0)$ ;      b)  $(\text{float}(a+b+c+d))/4$ ;  
 c)  $(a+b+c+d)/4$ ;      d)  $(a+b+c+d)/4.0$ ;
38. What is the perimeter of the circle  $(x-1)^2 + (y-2)^2 = 100$ ? Ans:
39. Elaborate Li-Fi: \_\_\_\_\_
40. What is the greatest prime number among two-digit integers? Ans:
41. Fill in the blanks in the following sequence:  
 2, 8, 18, \_\_\_\_\_, 50, 72
42. If  $y=x^{\alpha}$ , then what is the value of  $dy/dx$  at  $x=1$ ?  
 Ans:
43. Which one is reversible logic gate?  
 a) AND      b) NOT  
 c) OR      d) XOR
44. If  $f(x)=x[x+1]$ , then  $f(3) f(5)=?$  Ans:
45. Which one is a non-volatile memory?  
 a) ROM      b) CD  
 c) Hard disk      d) all of them.
46. For MAC address, MAC stands for \_\_\_\_\_
47. Nucleus of an atom consists of  
 a) Electron-Proton      b) Proton-Neutron  
 c) Neutron-Electron      d) None
48. If the eccentricity of a conic is less than unity, then it is called  
 a) Circle      b) Ellipse  
 c) Hyperbola      d) Parabola
49. Charges on a capacitor generate \_\_\_\_\_ field and current through a coil generates \_\_\_\_\_ field.
50. Which one of the following protocols is widely used in the Internet?  
 a) http      b) TCP/IP  
 c) FTP      d) SMTP

- (c) To keep systems programmers employed  
 (d) To allow people to use the computer
21. Which of the numbers does not belong in the following series?  
 2-3-6-7-8-14-15-30  
 (a) 3 (b) 7 (c) 8 (d) 15
22. The complexity of linear search algorithm is  
 O (a)  $O(n)$  (b)  $O(\log n)$  (c)  $O(n^2)$  (d)  $O(n \log n)$
23. In case of fiber-optic cables, which transmission mode is used for transmission data over long distance?  
 (a) infrared (b) Radio (c) Single mode (d) Multimode
24. Frames from one LAN can be transmitted to another LAN via the device—  
 (a) Router (b) Repeater (c) Modem (d) Bridge
25. POST means  
 (a) Post Operating System Test (b) Power On Self Test  
 (c) Power On Self Timing (d) None
26. Which one of the following is more near in meaning to the word "outskirt"?  
 (a) Dress (b) Boundary (c) Sky (d) None of the above
27. IPv6 increases the size of the IP address from  
 (a) 64 to 132 bits (b) 32 to 128 bits  
 (c) 64 to 128 bits (d) None
28. If you want your condition to depend on two conditions being true, what is the proper notation to put between the two Boolean statements?  
 (a) || (b) & (c) | (d) &&
29.  $A = \{4, 2, 3\}$ . What is the cardinality of set A?  
 (a) 24 (b) 3 (c) 2 (d) 9
- The intersection ( $\cap$ ) operation on two relations/tables returns  
 (a) All records of both tables  
 (b) Only common records  
 (c) Records from the left table/relation only  
 (d) None
- Ques: Answer the following questions shortly.  
 Each question carries 2 (two) points.
- Write in brief 2-tier and 3-tier software system.
33. If the letters in the word, "TRIANGLE" are rearranged at random, find the probability that the first letter is an A.
34. Write down the main phases of SDLC.
35. List the Four important layers of the OSI model in order.  
 1. Data link layer  
 2. Communication layer  
 3. Network layer  
 4. Transmission layer.
36. What are the major components of a web search engine?
37. Two sides of a triangular field are of the same length 13 ft. Third side is 10' in length. Find the area of the field in square feet?
38. What will be the output if you will compile and execute the following C code?
- ```
#include<stdio.h>
#define x 5+2
void main()
{
    int i;
    i=x*x*x;
    printf("%d", i);
```
- Output is = 21
39. Evaluate  $\int_0^{\sqrt{\pi}} 2 \ln(e^x) dx$
40. Write down the SQL DDL definition to create a bank account relation with a primary key declaration.

How many users are possible from the subnet mask of 255.255.255.224 of class C IP.



23

Applicant's Name: Md. Rezaul Huq

Roll: 1511079

**GROUP-A:** Put a tick mark (/) on the correct answer for multiple choice questions (MCQ) and Fill ans where applicable. Each question carries 1 (one) point.

The output of the following program is

4

```
#include<stdio.h>
void fun(int num)
int main()
{
    int a = 4;
    fun(a);
    printf("%d\n", a);
    return 0;
}
void fun(int x)
{
    x = x+3;
    return;
}
```

Which of the following computer language is used for artificial intelligence?

- (a) FORTRAN (b) PROLOG (c) C (d) COBOL (e) none

Divide 30 by half and add ten. What do you get?

- (a) 25 (b) 40 (c) 70 (d) 20

Which of the following is not in connection with SQL statement?

- (a) SELECT (b) INSERT (c) CONCATE (d) DELETE

Which development has made programming easier?

- (a) Object-oriented programming (b) Visual Programming  
(c) Both of the above (d) None of the above

$xy = c$  is the equation of a \_\_\_\_\_.

- (a) Straight line (b) hyperbola (c) parabola (d) ellipse

If a coin is tossed twice, find the probability of tossing a head and then a head again?

- (a) 0 (b) 1/8 (c) 1/4 (d) 1 (e) 1/2

By which technology Internet file can be sent secretly?

- (a) encryption (b) secure data interchange  
(c) cryptogram (d) regulated code

When a domain is submitted to DNS, it converts to

- (a) binary (b) hexadecimal (c) IP (d) URL

Find the variance of 2, 2, 2, and 2.

- (a) 2 (b) 0 (c) 1 (d)  $\infty$

Profusion is most nearly opposite in meaning to

- (a) Plenitude (b) Confusion (c) Sparseness  
(d) Celerity (e) Apology

Which one is Correct in Java?

- (a) int x==0; (b) int x = 0;  
(c) int x ="Rahim"; (d) None

A binomial expression connects two words using

- (a) and (b) or (c) from (d) none

14. Which of the following statements concerning relational DBMS is true?  
 (a) A foreign key field may be null  
(b) A primary key field may be null  
(c) All relations must be in at least third normal form  
(d) Many to many mappings cannot be represented.

15. Which of the following TCP/IP protocol is used for transmitting electronic mail message from one machine to another?  
 (a) FTP (b) SNMP (c) SMTP (d) RPC

16. If  $xy = 2$  and  $xy^2 = 8$ , what is the value of  $x$ ?  
 (a) 1/2 (b) 3/4 (c) 2 (d) 4

17. Which of the following tasks is a function of the operating system?  
 (a) Adding data to a spreadsheet  
(b) Producing a database report  
(c) File management  
(d) Producing a presentation

18. Virginia, \_\_\_\_\_ is said to be quite beautiful, is the home of many senators and representatives now.  
 (a) that (b) in which (c) which (d) where

19. Which one of the following is not a relational operator?  
 (a) < (b) <= (c) = (d) !=

20. Which of these numbers cannot be a probability?  
 (a) -0.00001 (b) 0.5 (c) 1 (d) 0

21. Which layer of OSI is responsible for ASCII code assignment of character?  
 (a) Data link layer (b) Presentation layer  
(c) Session layer (d) Application layer

22. UML stands for Unified Markup.

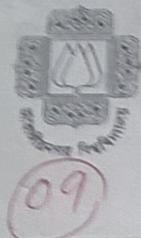
23. The speed of the supercomputer is generally measured in \_\_\_\_\_.  
 (a) GHz

24. Routers connect --

- (a) Two networks (b) Two PCs  
(c) Two bridges (d) none

25. Find the next three terms in the sequence 1, 1, 2, 4,  
 (a) 3, 40, 67 (b) 44, 81, 149 (c) 13, 7, 4 (d) 31

26. Which of the following is not a valid variable name?  
 (a) int number (b) float\_rate  
(c) int variable\_count (d) float \$sum



## EMCS Program

Time : 1 Hour  
Marks: 50

09

## Admission Test Spring 2015

Applicant's Name: SHOWRAY ACHARJYYA

Roll: 1517113

**GROUP-A:** Put a tick mark (✓) on the correct answer for multiple choice questions (MCQ) and Fill in the blank where applicable. Each question carries 1 (one) point.

1. Which of the following memories needs refresh?
  - (a) SRAM (b) DRAM (c) ROM (d) All of above
2. A perfectionist is someone who feels \_\_\_\_\_ when he makes even the most minuscule of errors.
  - (a) Possibility (b) indifference (c) vexation (d) condemnation
3. What is the type of the image?
 

$\begin{bmatrix} 12 & 75 & 90 \\ 1 & 154 & 246 \\ 0 & 1 & 3 \end{bmatrix}$

  - (✓) RGB (b) Gray Scale (c) Binary (d) NTSC
4. What percent of 30 is 0.15?
  - (a) 0.3 (b) 1.5 (c) 0.01 (d) None of these
5. The perpendicular of the line  $2x+3y=4$  is
  - (a)  $3x-2y=4$  (b)  $3x+2y=4$  (✓)  $2x-3y=4$  (d)  $2x+3y=0$
6. The Storage memory is placed between RAM and CPU.
7. Which of the following data structure is not linear data structure?
  - (a) Arrays (b) Linked lists
  - (✓) Both of the above (d) None of the above

This is an IP address 168.212.226.204. On which class this address belongs to?

- (a) Class A (b) Class B (✓) Class C (d) Class D

We should keep pace \_\_\_\_\_ time and technology.

- (✓) in (b) out (c) with (d) none

Write the equation of a circle with radius r and center is at (0,0).

In TCP/IP network, the port address is

- (a) 16-bit (✓) 32-bit (c) 64-bit (d) 128-bit

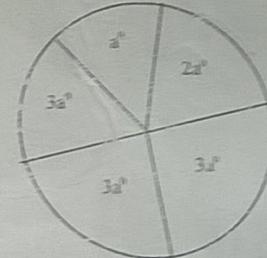
VLANs can \_\_\_\_\_.

- (a) reduce network traffics
- (b) provide an extra measure of security
- (c) either (a) or (b)

- (✓) both (a) and (b)

13. Which of the following is not usually part of the responsibilities of a database administrator?
  - (a) Approving structural changes to the database
  - (✓) Designing data entry screens
  - (c) Ensuring that an adequate back-up regime is in place
  - (d) Issuing accounts to users
14. Volatile is most nearly opposite in meaning to
  - (a) Flighty (b) Calm (✓) Variegated (d) Rancid
15. The function of LLC sub-layer of data link layer are:
  - (a) Framing and channel allocation
  - (b) Channel re-allocation (c) Error control
  - (c) Error control and security
  - (✓) Framing and error control
16. Who preside the interface between a process and the OS?
  - (✓) Kernel (b) System Calls (c) API (d) Processor
17. What is the average of the five angles?
 

(a) 45  
 (b) 72  
 (c) 60  
 (d) 48



18. Which of the following is generally a best fit of normalization?
  - (a) Performance is improved
  - (b) Insertion anomalies are avoided
  - (c) Selection anomalies are avoided
  - (✓) Number of tables is reduced
19. Which of the following is not based on all the observations?
  - (a) Mode (✓) Arithmetic Mean
  - (c) Geometric Mean (d) Harmonic Mean
20. The primary purpose of an operation system is:
  - (✓) To make computers easier to use
  - (b) To make the most efficient use of the computer hardware

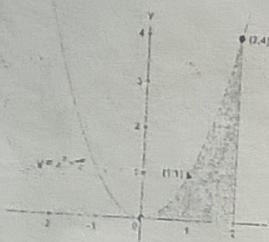
27.  RAM is used as a short memory because it is  
 (a) volatile (b) has small capacity (c) is very expensive  
 (d) is programmable (e) None of the above.
28. Which of the following is a database language?  
 (a) Data Manipulation language  
 (b) Data Definition Language  
 (c) Query Language  
 (d) All of the above

GROUP-B: Answer the following questions shortly.  
 Each question carries 2 (two) points.

29. What does SQL stand for, and what purpose it is used for?

Structure Query Language.  
 It is used for Database programming.

30. Determine the shaded area using integration.



31. Express the following data in normalize form.  
 (10, 5, 20, 35, 30)

5, 10, 20, 30, 35

32. Give examples of a strong-entity and a weak-entity.

Give the concept of VPN in 2 sentences.

VPN means Virtual private network.

What is the dotted decimal notation of the IP address  
~~11000000 11100100 00010001 00111001~~?

~~192 228 35.57~~

192.228.17.57

When does deadlock situation occur?

If in a database error.

When microprocessor is

What is the function of the BIOS?

IOS means Basic input output system.

29. Evaluate the value of the following expressions:  
 (a)  $\text{floor}(-9.5) \rightarrow -9$    
 (b)  $\text{ceil}(-3.4) \rightarrow -3$
30. FTP is built on OSI architecture.

39. When does page fault error occur?

40. What is GPU? Describe the steps of instruction cycle.

Graphical processor unit.

|                                                                                   |                                                                                                                                                             |                                                                                    |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  | <b>Department of Computer Science and Engineering<br/>Jahangirnagar University, Dhaka-1342</b><br><b>PMSCS Program</b><br><b>ADMISSION TEST SPRING 2018</b> | Signature of the Invigilator _____<br><br><b>Time : 1 Hour</b><br><b>Marks: 50</b> |
| <b>Applicant's Name:</b> ..... <b>Gender:</b> M / F <b>Roll:</b> .....            |                                                                                                                                                             |                                                                                    |

**GROUP- A: Put a tick mark (✓) on the correct answer. Each question carries 1 (one) mark (40×1=40).**

1. What value will be printed through the following C statement?  
 $\text{printf}("%d", 13/10+10.93)$
- A. 11      B. 12  
C. 10      D. None of the above
2. Which member would replace the question mark in series 7, 12, 19, ?, 39
- A. 24      B. 28  
C. 31      D. 33
3. Which one is memoryless system?
- A.  $y(n)=y(n-1)+y(n-2)$       B.  $y(n)=10y(n-3)$   
C.  $y(n)=10$       D. None of the above
4. The price of a cycle is reduced by 25 percent. The new price is reduced by a further 20 percent. The two reductions together are equal to a single reduction of
- A. 45%      B. 40%  
C. 35%      D. 32.5%
5. From the following algorithm design techniques which one is used to find all the pairs of shortest distances in a graph?
- A. Backtracking      B. Greedy  
C. Dynamic programming      D. Divide and Conquer
6. \_\_\_\_\_ is the concept in which a process is copied into main memory from the secondary memory according to the requirement.
- A. Paging      B. Demand paging  
C. Segmentation      D. Swapping
7. The \_\_\_\_\_ provides a set of operations that take one or more relations as input and return a relation as an output.
- A. Schematic representation      B. Relational algebra  
C. Scheme diagram      D. Relation flow
8. MAC address is of
- A. 24 bits      B. 36 bits  
C. 42 bits      D. 48 bits
9. Did you watch the football \_\_\_\_ TV last night?
- A. on      B. by  
C. to      D. in
10. Which of the following sorting algorithm is of divide-and-conquer type?
- A. Bubble sort      B. Insertion sort  
C. Quick sort      D. All of above
11. System design is carried out
- A. as soon as system requirements are determined      B. whenever a system analyst feels it is urgent  
C. after final system specifications are approved by the organization      D. whenever the user management feels it should be done
12. Half duplex data transmission means
- A. Data flow in one direction      B. Data flow both direction simultaneously  
C. Data flow both direction alternatively      D. None of them
13. Which of the following searching algorithm is efficient?
- A. Binary search      B. Linear search  
C. Huffman search      D. Excessive Search
14. Which one is not a valid identifier?
- A. \_Itestdata      B. test\_data
- C. testdata      D. Itestdata
15. The network layer protocol of internet is
- A. Ethernet      B. Hypertext Transfer Protocol  
C. Internet Protocol      D. None of the above
16. 20% of 2 is equal to
- A. 20      B. 4  
C. 0.4      D. 0.04
17. In C, if a function does not explicitly specify a return type, it is assumed to return \_\_\_\_\_ by default.
- A. Integer      B. Char  
C. Void      D. float
18. Computer's ability to use disk storage as memory is called
- A. cache memory      B. virtual memory  
C. CMOS memory      D. associative memory
19. The barcode reader is an \_\_\_\_\_ device
- A. pointing      B. storage  
C. output      D. input
20. Concurrent access to shared data may result in data
- A. consistency      B. inconsistency  
C. recovery      D. repository
21. To avoid the race condition, the number of processes that may be simultaneously inside their critical section is
- A. 4      B. 1  
C. 8      D. 16
22. Maximum number of nodes in a binary tree with height k, where root is height 0, is
- A.  $2^k - 1$       B.  $2^{k+1} - 1$   
C.  $2^{k+1}$       D.  $2^k + 1$
23. Which one of the following task is not done by data link layer?
- A. framing      B. error control  
C. flow control      D. data encryption
24. A tuple is a
- A. Column of a table      B. Two dimensional table  
C. Row of a table      D. Key of a table
25. Which of the following is not a group function?
- A. avg()      B. sum()  
C. min()      D. max()
26. A sorting algorithm which can prove to be a best time algorithm in one case and a worst time algorithm in worst case
- A. Quick Sort      B. Heap Sort  
C. Merge Sort      D. Insert Sort
27. It was really difficult, but eventually he \_\_\_\_\_ get tickets for the match
- A. was able to      B. can  
C. could      D. would can
28. Metadata means
- A. data that describes other data      B. data used as metaphor  
C. unnecessary data      D. data stored in memory
29. Which keyword in MySQL can be used for sorting?
- A. Count      B. Order by  
C. Group by      D. Min
30. According to Boolean algebra theorem  $x \cdot x$  is equal to
- A. x      B. 1

### SET-A

- C. 0 D.  $x'$   
 31. Which one is the synonym of epitome?  
 A. Epic B. Poem  
 C. Abstract D. Monument  
 32. Which of the following computer language is used for artificial intelligence?  
 A. FORTRAN B. PROLOG  
 C. C D. COBOL  
 33. Which of the following type of class allows only one object of it to be created?  
 A. Virtual class B. Abstract class  
 C. Singleton class D. Friend class  
 34. A \_\_\_\_\_ is a stored program that is attached to a table or a view.  
 A. Pseudo file B. embedded SELECT  
 C. trigger D. None of the above  
 35. SQL views can be used to hide  
 A. Columns and rows B. Complicated SQL syntax only  
 C. both of the above D. None of the above
36. Privacy and anti-jamming can be achieved by  
 A. multiplexing B. Spreading  
 C. Both A and B D. None of above  
 37. All protocol provides source authentication and data integrity, but not  
 A. Integrity B. Privacy  
 C. Non repudiation D. Both A and C  
 38. Which one requires refresh circuitry?  
 A. SRAM B. DRAM  
 C. DMA D. None  
 39. Which one is the frequently used network topology?  
 A. Mesh B. Bus  
 C. Star D. Ring  
 40. Which of the following gate is represented by  $x+y=2$ ?  
 A. NOR gate B. OR gate  
 C. NOT gate D. XOR gate

**GROUP-B: Answer the following questions briefly. Each question carries 1 (One) mark (10×1=10)**

41. The cost function of a product can be expressed by the following function. Which value of variable  $x$  indicates optimum cost?

$$f(x) = x^2 - 100x + 3225$$

42. Consider a recursive function:

$$H(n) = \begin{cases} 3, & n \leq 2 \\ 2 * H(n-1) + 5, & \text{Otherwise} \end{cases}$$

Find  $H(5)$ .

45. A Z B Y D W G T ??  
 Which two letters come next?

46. How many users can be serviced by the following classless IPv4 address?  
 205.16.37.39/28

43. On dividing a number by 357, we get 39 as remainder. On dividing the same number 17, what will be the remainder?

44. What will be the output of the following program?

```
void test (int *a);
main ( ){
    int x=50;
    test (&x);
    printf ("%d\n", x);
}
void test (int *a){
    *a=*a+50;
}
```

47. Which number should replace the question marks ???

|    |    |   |   |
|----|----|---|---|
| 17 | 8  | 5 | 5 |
| 13 | 7  | 5 | 4 |
| 6  | 12 | 6 | 3 |
| 10 | 6  | 4 | ? |

48. What is the output of the following program?

```
#include<iostream>
using namespace std;
main () {
    class student {
        int mno=10;
    };
    cout << v.mno;
}
```

49. Fill in the blank  
 He liked to \_\_\_\_\_ his drinks.

50. If  $y = \log_2(1+x)$ , then  $x=?$

## PMSCS Previous Years Questions Solve

### MCQ Part

1. Concurrent access to share data may result ..... Ans: Inconsistency
2. DRAM refers to ..... Ans: Dynamic Random Access Memory.
3. Datagram is related with ..... Service and Virtual Circuit is related to ..... Service?  
Ans: Connectionless, Connection Oriented.
4. In C programming if a function does not explicitly specify a return type it is assumed to return an ..... By default. Ans: Integer
5. Mouse is a/an ..... Device? Ans: Input.
6. Flash memory was developed taking the concept of .....? Ans: EEPROM
7. A constructor is Called Whenever ..... Ans: Object is declared.
8. A card is shown from a pack of 52 cards. The probability of getting a queen of club or king of heart is ..... Ans: 1/26
9. The term MIPS refers to ..... Ans: Millions of Instructions Per Second.
10. The automatic execution of some SQL statements can be started automatically due to any change to a database relation can be caused by ..... Ans: Trigger
11. Number next to the series: 10, 17, 26, 37 ..... Ans: 50
12. A girl introduced a boy as the son of the daughter the father of her uncle. The boy is girls .....  
Ans: Brother.
13. The product of two numbers is 120 and the sum of their square is 289. The sum of numbers is .....  
Ans: 23
14. Frames from one LAN can be transmitted to another LAN via the device ..... Ans: Bridge
15. What will be the equation of the line that pass through the point (1,2) and is parallel to  $2x+3y=4$ ? Ans:  
 $2x+3y=8$
16. The main purpose of a primary key in a database table is ..... Ans: Searching
17. Which of the following is a valid declaration of an object of class box in JAVA? Ans: Box obj=new Box();
18. Creating a new class using one or more new existing classes is known as ..... Ans: Inheritance
19. Communication between a computer and a Keyboard involves ..... transmission? Ans: Simplex
20. One nibble means ..... Ans: 4 bits
21. Logical design of database is called ..... Ans: Database Schema
22. Time factor when determining the efficiency of algorithm is measured by ..... Ans: Counting the number of key operations.
23. The SQL where clause ..... Ans: Limits the raw data

24. What percent of 50 is 0.15? Ans: 0.075
25. Digital Modulation on bit string (sender) operates in ..... layer of OSI? Ans: Physical
26. Subset of {b,c,d} is ..... Ans: {}
27. The amount of time a program takes from when a request was submitted until the first result is processed is ..... Ans: Response time
28. Which of the following memory needs refreshing? Ans: DRAM
29. What are the next two numbers of the series: 2,5,6,11,9,17,12,23 Ans: 15,29
30. Synonym of Probity is ..... Ans: Honesty
31. Memory Sizes: Mega, Giga, Tera, ..... Ans: Peta
32. The decimal number -34 is expressed in 2's complement form as ..... Ans: 11011110
33. ..... is a special type of store procedure, executed when certain events occur? Ans: Trigger
34. Hierarchical database represented using a ..... diagram? Ans: Tree structured
35. If n and k are positive integers and  $8n=2k$  what is the value of  $n/k$ ? Ans:  $\frac{1}{4}$
36. A switch is most often used to connect ..... Ans: Individual Computer
37. IP address 168.212.226.204 belongs ..... Ans: Class B
38. If  $xy=2$  and  $xy^2=8$  what is the value of x? Ans:  $\frac{1}{2}$
39. A constructor is classed whenever ..... Ans: an object is declared
40. The data link layer takes the packet from ..... layer? Ans: Network
41. Which one makes data access from database faster? Ans: Indexing
42. TCP/IP protocol used for transferring email from one machine to another is ..... Ans: SMTP
43.  $A=\{2,3,4\}$  what is the cardinality of set A? Ans: 3
44. Best way of protecting data from loss is ..... Ans: Regular Backup
45. Which of the following is an invalid variable name? Ans: double num ber
46. Which of the following is more near meaning to "Outskirt"? Ans: Boundary
47. ..... can reduce network traffics and provide an extra measure of security? Ans: VLAN
48. The primary purpose of an operating system is ..... Ans: To make the most efficient use of the computer hardware.
49. Who preside the interface between a process and the OS? Ans: System Calls
50. We should keep pace ..... time and technology. Ans: With
51. ..... memory is placed between RAM and CPU? Ans: Cache
52. Benefit of Normalization is ..... Ans: Number of tables reduced.
53. POST means ..... Ans: Power on Self-Test
54. Multiple choice questions (MCQ) are evaluated by ..... Ans: OMR
55. An entity is an ..... Ans: Collection of items in an application.
56. XML makes it easier for ..... Ans: Machine to read websites
57. ..... cables widely used in LAN's? Ans: Co-axial
58. Which technique is preferable for huge data transfer between I/O and Memory? Ans: Memory Mapped I/O

59.  $d/dx e^x$  is ..... Ans:  $e^x$
60. An optical drive uses the ..... light to read data? Ans: Reflected
61. Find the next two element of the series: 0,1,2,3,5 Ans: 8,3
62.  $3^x \cdot 3^x \cdot 3^x = ?$  Ans:  $3^{3x}$
63. Full form of WIMAX = Worldwide Interoperability for Microwave Access
64. Which of following is volatile? Ans: RAM
65. ..... is known as "IRON LADY" of Britain? Ans: Margaret Thatcher.
66. The fundamental colors used in TV monitor are ..... ? Ans: Red, Green, Blue
67. He is blind ..... the system faults? Ans: of
68. MPEG is compressed form of ..... File? Ans: Video
69. Synonym of Inhibit is ..... ? Ans: Protect
70. If the side of a square is increased by 20% then the area increased by ..... Ans: 44%
71. If P and Q are prime numbers, how many divisors does the product  $p^3q^6$  have? Ans: 28
72. Which social media website started out as a brand promotion service? Ans: Facebook
73. What type of RAM is often used for system memory? Ans: SRAM
74. IPv4 address is represented in dotted decimal notion using ..... ? Ans: 32 bits
75. Hub falls in ..... Layer but bridge falls in ..... Layer? Ans: physical, Data link
76. Flops used to measure ..... Ans: Processor speed or Performance
77. The furthest planet of Solar System is ..... Ans: Sun
78. Einstein awarded the noble prize for discovering ..... Ans: Law of photoelectric effect (physics)
79. Mugol emperor Shahjahan is the son of ..... and grandson of ..... Ans: Emperor Jahangir, Akbar
80. Voice/Video causes ..... network traffic? Ans: Real Time
81. Operating system provides interface between ..... and ..... Ans: Programs, Computer Hardware
82. In TCP/IP the port address is ..... Ans: 16 bit
83. The perpendicular of the line  $2x+3y=4$  is ..... Ans:  $2x-3y=4$
84. The intersection operation on two relations/tables returns ..... Ans: only common records
85. The complexity of linear search algorithm is ..... Ans:  $O(n)$
86. The function of LLC sublayer of data link layer are ..... and ..... Ans: Framing, error control
87. In case of fibre optic cables, which transmission mode is used for transmission data over long distance?  
Ans: Single Mode.
88. A perfectionist is someone who feels ..... when he makes even the most minuscule of errors.  
Ans: Condemnation
89. Frames from one LAN can be transmitted to another LAN via the device ..... Ans: Bridge
90. Volatile is most nearly opposite in meaning to ..... Ans: flighty

91. Which part of the computer performs logical operations? Ans: ALU
92. Database is ..... Ans: Collection of interrelated data
93. 4,10,5,12,6,14, ..... Ans: 7,16
94. What type of network topology is usually used? Ans: Star
95. The function of DNS server is to convert ..... name to ..... address? Ans: DNS, IP
96. Outsourcing involves ..... Ans: Third party software development
97. Polished data also known as ..... Ans: prefix notation
98. Light propagates through an optical fibre because of ..... Ans: Reflection of light through core.
99. ..... devices used to connect different types of networks? Ans: gateway
100. ..... is a DBMS tool. Ans: ORACLE
101. The train is ..... To start? Ans: about
102. ..... is platform independent programming language. Ans: JAVA
103. ..... protocol is widely used for internet? Ans: TCP/IP
104. Arithmetic and Geometric mean of x and y will be the same if, ..... Ans:  $x=y$
105. MR. Karim earns x taka in 3 months and expends the same amount in 4 months. How much he saves? Ans:  
x taka
106. Take ..... What I say. Ans: Off
107. Metadata means ..... Ans: Data that describes other data
108. Active HUB is under ..... Layer but passive HUB is under ..... Layer. Ans: physical, data link
109. If the arithmetic and geometric mean of two numbers is equal and if one of them are 10 then the other one is ..... Ans: 10
110. Which of the following programming language use interpreter instead of compiler? Ans: MATLAB and  
PYTHON
111. The unit of Bandwidth in data communication is ..... Ans: bit per second
112. All good comic writers use humor to ..... not to side stop the problems of human behavior. Ans:  
Confront
113. 10 people shake hands each other. How many handshakes will be there in total? Ans: 45
114. If  $\log x^{324}=4$  then  $x=?$  Ans:  $3\sqrt{2}$
115. Who introduced the stored program concept? Ans: John Von Neuman
116. Mac address is of ..... Bits? Ans: 48
117. Which number will replace the question mark of the series: 7, 12, 19, ?, 39 Ans: 28
118. Did you watch the football match.....TV last night? Ans: on
119. Which of the following sorting algorithm is of divide and conquer type? Ans: Quick Sort
120. Half Duplex data transmission means ..... Ans: Data flow both directions alternatively
121. The network layer protocol of internet is ..... Ans: internet protocol
122. 20% of 2 is ..... Ans: 0.4
123. Computers ability to use disk storage as memory is called ..... Ans: virtual memory

124. Maximum number of nodes in a binary tree with height k where root is height 0 is ..... Ans:  $2^k - 1$
125. A tuple in database means ..... Ans: Row of a table
126. Which keyword in MYSQL can be used for sorting? Order by
127. Synonym for epitome is ..... Ans: epic
128. .... language is used for Artificial Intelligence? Ans: PROLOG
129. Which of the following type of class allows only one object of it to be created? Ans: Singleton class
130. Which of the following gate is represented by  $x+y=z$ ? Ans: OR gate
131. The price of a cycle is reduced by 25% The new price is reduced by a further 20% the two reductions together are equal to a single reduction of ..... Ans: 45%
132. .... technique used to find all the points of shortest distance in a graph? Ans: greedy
133. .... Provides a set of operations that take one or more relations as input and return a relation as output? Ans: Relational Algorithm
134. The barcode reader is an ..... Device? Ans: input
135. The common fields of an instruction are ..... And ..... Ans: Operation, Address
136. A distributed database has which of the following advantage over a centralized database? Ans: Modular growth
137. Which one is faster on the basis of data access and retrieval time? Ans: Cache memory
138. Semantic error occurs due to ..... Ans: incorrect logic
139. Which of the following is not based on all the observations? Ans: Harmonic mean
140. Which of the number does not belong to the series: 2 3 6 7 8 14 15 30 Ans: 8
141. IPv6 increases the size of the IP address from ..... to ..... bits. Ans: 32, 128
142. Which of the following is not usually part of the responsibilities of a database administrator? Ans:  
Designing Data Entry Screens
143. Which of the following is generally a benefit of normalization? Ans: Performance is improved
144. Which one is correct in JAVA? Ans: int x=0;
145. Which of the following is linear data structure? Ans: Array and Linked List
146. A coin is tossed twice. Find the probability of tossing a head and then a head again. Ans:  $\frac{1}{4}$
147. Which of the following is not a relational operator? Ans: =
148. Which of the statement is true in RDBMS? Ans: foreign key can be null
149. Find the variance of 2,2,2,2 Ans: 0
150. What is the dotted decimal notation of the IP address: 11000000 11100100 00010001 00111001?  
Ans: 192. 228. 17.57
151. By which technology internet file can be sent secretly? Ans: Encryption
152. The speed of supercomputer is generally measured in ..... Ans: FLOPS (Floating Point Operations Per Second)
153. Which of these numbers can not be a probability? Ans: -0.00001
154. If  $xy=2$  and  $xy^2=8$  then  $x=?$  Ans:  $\frac{1}{2}$

- 155..... is not in connection with SQL? Ans: Concat
- 156.A binomial expression connects two words using ..... Ans: and
- 157.Floor(-9.5) = ? Ans: -10
- 158.Ceil(-3.4)=? Ans: -3
- 159.Which development has made programming easier? Ans: both (OOP and Visual Programming)
- 160.Which of the following is an invalid variable name? Ans: float \$sum
- 161.Router connects ..... Ans: Two networks
- 162.Virginia ..... is said to be quite beautiful. Ans: which
- 163.When a domain is submitted to DNS, it converts to ..... Ans: IP
- 164.Which layer of OSI is responsible for ASCII code against character? Ans: presentation layer
- 165.Divide 30 by half and add 10 results? Ans: 70
- 166.XY=C is the equation of ..... Ans: Hyperbola
- 167.Profusion opposite ..... Ans: Plethora
- 168.Function of operating system is ..... Ans: File Management
- 169.Find the next three terms in the sequence: 1,1,2,4,7,13,24 Ans: 44,81,149
- 170.FTP is build on ..... Architecture? Ans: Client Server
- 171.UML stands for ..... Ans: Unified Modeling Language

## Written Part

- Differentiate between Strong entity and Weak entity.

| S.NO | Strong Entity                                                        | Weak Entity                                                                                   |
|------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| 1.   | Strong entity always has a primary key.                              | While a weak entity has a partial discriminator key.                                          |
| 2.   | Strong entity is not dependent on any other entity.                  | Weak entity depends on strong entity.                                                         |
| 3.   | Strong entity is represented by a single rectangle.                  | Weak entity is represented by a double rectangle.                                             |
| 4.   | Two strong entity's relationship is represented by a single diamond. | While the relation between one strong and one weak entity is represented by a double diamond. |
| 5.   | Strong entities have either total participation or not.              | While weak entity always has total participation.                                             |

- Briefly describe 2 tier and 3 tier system

<https://www.geeksforgeeks.org/difference-between-two-tier-and-three-tier-database-architecture/>

| S.NO | Two-Tier Database Architecture                                                                                                              | Three-Tier Database Architecture                                                                                                  |
|------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 1    | It is a Client-Server Architecture.                                                                                                         | It is a Web-based application.                                                                                                    |
| 2    | In two-tier, the application logic is either buried inside the user interface on the client or within the database on the server (or both). | In three-tier, the application logic or process resides in the middle-tier, it is separated from the data and the user interface. |
| 3    | Two-tier architecture consists of two layers : Client Tier and Database (Data Tier).                                                        | Three-tier architecture consists of three layers : Client Layer, Business Layer and Data Layer.                                   |
| 4    | It is easy to build and maintain.                                                                                                           | It is complex to build and maintain.                                                                                              |
| 5    | Two-tier architecture runs slower.                                                                                                          | Three-tier architecture runs faster.                                                                                              |
| 6    | It is less secured as client can communicate with database directly.                                                                        | It is secured as client is not allowed to communicate with database directly.                                                     |
| 7    | It results in performance loss whenever the users increase rapidly.                                                                         | It results in performance loss whenever the system is run on Internet but gives more performance than two-tier architecture.      |
| 8    | Example – Contact Management System created using MS-Access or Railway Reservation System, etc.                                             | Example – Designing registration form which contains text box, label, button or a large website on the Internet, etc.             |

Solve yourself:

- Write down the SQL DDL definition to create a bank account relation with the primary key declaration
- How many users are possible from the Subnet Mask to 225.225.225.224 of class C IP?
- If the letter in the word “TRIAGLE” are rearranged at random find the probability that the first letter is an A

```
void fun (int num)
int main ()
int a = 4;
fun (a);
printf ("%d \n", a);
return 0;
```

```
void fun (int x)
{
    x = x + 3;
    return;
```

What will be the output ?

Ans: 4 [compiler error may be]

```
{ printf ("x=%d/n", (n<0)? -1;
        (n==0)? 0; 1); }
```

What is the Output ?

Ans: None/Error

```
#define x 5+2
main ()
int i;
i = x*x*x;
printf ("%d", i);
```

Ans: 27

```
main ()
int a = 10;
printf ("%d %d %d", a, ++a, a++);
```

What will be the output ?

Ans: 12 12 10

What is the value returned by the function  
Call : Fun (2);

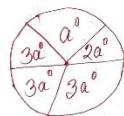
```
int Fun (int n) {
if (n == 4) return 2;
else return 2*n + 1;
```

Ans: 5

```
main ()
float t;
t = 4/5 + 9/4;
printf ("% .2f", t);
```

What will be the output ?

Ans: 1.00



What is the average of the  
five angles ?

Ans: 72       $\left\{ \frac{360^\circ}{5} = 72 \right\}$

④ What is the purpose of SQL ?

Ans: Structured Query Language

⇒ Adding, Updating and deleting

⇒ Modifying database table and index structure.

⇒ Retrieving subsets of information.

— o —

④ When does a page fault occurs?

Ans: A page fault occurs when a requested page is mapped in virtual address space but not present in memory.

— o —

④ What is WiMAX ?

Ans: WiMAX (Worldwide Interoperability for Microwave Access) is a telecommunication tech. aimed to provide wireless data over long distances.

— o —

④ What are the functions of BIOS ?

Ans: BIOS is a firmware used to perform hardware initialization during the booting process and provide runtime services for OS and programs.

Major functions of BIOS

1. POST (Power On Self Test)
2. Bootstrap loader
3. Driver setup
4. CMOS setup

— o —

④ What is GPU ?

Ans: GPU (Graphics Processing Unit) is designed for parallel processing. GPU used specially for graphics and video rendering.

— o —

④ What are the steps of instruction cycle ?

Ans: 1. Fetch Instructions from memory

2. Decode the instructions

3. Read the effective address from

4. Execute the instruction. memory.

— o —

④ Write short note on VPN

Ans:

⇒ VPN → Virtual Private Network

⇒ Establishes a protected network connection.

⇒ Encrypts internet traffic.

⇒ Disguish one's identity.

⇒ Makes difficult to track online activities.

— o —

④ How the measurement of TV monitor is performed ?

Ans: The screen size of a TV is measured diagonally from one corner of the ~~flat~~ panel to the opposite corner. This does not include the bezels or any other outside surface of the TV.

— o —

④ What are the major components of web search engine ?

Ans: Components :

1. Search Interface
2. Crawler / Spider / Bot
3. Indexer
4. Database

④ Prove  $A + \bar{A}B = A + B$

Ans:

$$\begin{aligned}
 & A + \bar{A}B \\
 &= A(1+B) + \bar{A}B \quad [1+B = 1 \text{ so basically we didn't} \\
 & \quad \text{add anything extra}] \\
 &= A + AB + \bar{A}B \\
 &= A + B(A + \bar{A}) \\
 &= A + B, \text{ i} \\
 &= A + B \quad [\text{Proved}]
 \end{aligned}$$

④ What are the main phases of SDLC?

- |                |                   |
|----------------|-------------------|
| 1. Planning    | 5. Testing        |
| 2. Analysis    | 6. Implementation |
| 3. Design      | 7. Maintenance    |
| 4. Development |                   |

④ Interpreter and Compiler

Ans: Interpreter executes statements of the whole program one by one.  
Compiler executes the whole program at once.

④ Operating System:

An Operating System is a program on which application programs are executed and acts as an interface between the user and computer hardware.

OS functions

- ⇒ Memory management.
- ⇒ File management.
- ⇒ Device management.
- ⇒ Security.

④ What is Referential Integrity?

Ans: Referential Integrity is a relational database concept which states that the table relationships must always be consistent. A foreign key field must agree with the primary key that is referenced by primary key. Thus any primary key field changes must be applied to all foreign keys, or not at all.

④ What is the normalized form for following values?

10, 5, 20, 35, 30

Ans: -0.784, -1.117, 0.000, 1.117, 0.784

Explanation mean = 20 standard dev. 12.7475

$$\frac{(10-20)}{12.7475} = -0.784$$

and so on...

④ What is the difference between while and do while statements?

Ans: while is not executed if the condition is false but do while will execute at least once.

④ Differentiate between Active and passive attacks.

| Active attack                                           | Passive attack               |
|---------------------------------------------------------|------------------------------|
| In active attack modification of information take place | does not                     |
| Danger for integrity and availability                   | confidentiality              |
| System gets damaged                                     | does not but vulnerabilities |

④ Write down OSI layers sequentially.

1. Physical layer

2. Data Link layer

3. Network layer

4. Transport layer

5. Session layer

6. Presentation layer

7. Application Layer

⑤ Suppose  $a=2$  and  $b=8$  find the arithmetic mean and geometric mean.

Ans:

$$\text{Arithmetic Mean} = \frac{a+b}{2} = \frac{2+8}{2} = 5$$

$$\text{Geometric Mean} = \sqrt{ab} = \sqrt{2 \cdot 8} = \sqrt{16} = 4$$

⑥ Database Schema and instance.

Schema: Schema refers to the organization of data as a blueprint of how the database is constructed.

Instance: Database instance is a set of memory structures that manage database files.

⑦ What is SQL? Classify SQL statement in three categories.

Ans: SQL (Structured Query Language) is used to communicate with database. It's a standard language for RDBMS. Three categories are: DDL, DML, DCL

1. CREATE [To create objects in the Database]

2. ALTER [Alters the structure of the database]

3. DROP [Deletes objects from the database]

⑧ SIM and RIM

Ans:

SIM (Set Interrupt Mask)

Used to mask the hardware interrupt

RIM (Read Interrupt Mask)

Used to check whether the interrupt is masked or not.

⑨ What is the main problem of Mac address?

Ans: There are only  $2^{48}$  Mac addresses available. The only organizational structure of them is by manufacturer grouping which is completely useless for routing purpose.

[Sources:  
Quora]

|     |     |    |
|-----|-----|----|
| 12  | 75  | 90 |
| 184 | 246 | 12 |
| 0   | 1   | 3  |

which type of image is this?

Ans: Gray Scale.

আপনি যদি কনফিউজড থাকেন যে কোথায় এপ্লাই করলে ভালো হবে তাহলে আমাৰ বানানো নিচেৰ ভিডিওগুলো দেখুন সবকিছু বুঝো যাবেন ইনশা আল্লাহ।

- PMSCS and PMIT question pattern tutorial: [https://youtu.be/Z\\_z3H\\_jLVNo](https://youtu.be/Z_z3H_jLVNo)
- PMSCS এৱং সবৱকম তথ্য: <https://youtu.be/0b-Jyumpz3c>
- PMSCS এৱং ফ্ৰেসারদেৱ সাথে আমাৰ জুম মিটিং:  
<https://youtu.be/NUzfruj52rM>  
<https://youtu.be/gfDtb1J9h4>
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