

**Question Bank**

**Note:** A flat file is the simplest storage system. Flat files contain only one table of data which limits their use to simple data storage and retrieval systems. They are simple to set up and Easy to use. Smaller: store data by using less disk space than databases.

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**Sonali Bank Ltd.**  
**Assistant Database Administrator**  
**Exam: 2020**

**1. Which is not the steps of SQL Query processing?**

- a) Parsing      b) Translation      c) Optimization      d) None      **Ans: d**

**Note:** Query Processing is the activity performed in extracting data from the database. In query processing, it takes various steps for fetching the data from the database. The steps involved are: Parsing, translation, Optimization and Evaluation.

**2. Find the output:**

```
int a= 10, c, b;
c = (a=99)? b = 11:20;
printf("%d, %d", a, c);
```

- a) 11, 99      b) 99, 11      c) 20, 11      d) 99, 20

**Ans: b****3. What will be the output of following code?**

```
int x=5, y=5, z=5;
printf("%d", ++z+y-1-y+z+x++);
```

- a) 15      b) 17      c) 16      d) 19

**Ans: c****4. A computer system has 6 type drives and each process may need 3 type drives. What is the maximum number of processes than is guaranteed to be deadlock free?**

- a) 4      b) 3      c) 2      d) None

**Ans: c**

**Note:** We have to guarantee that the system will be deadlock free in every condition. So first of all we can't invent easy ways to allocate resources to the process, we have to see that even in worst condition, there is no deadlock. So in case of 2 processes there may never be possibility of deadlock. In case of 4 processes, not with your scheme of allocation but with some other allocation- for ex, give 2 resource to P, 1 to Q, 2 to R and 1 to S- results in deadlock- so it is not guaranteeing no-deadlock in 4 processes, while in case of 2 processes, system is guaranteed to be deadlock free.

**5. Consider the following table named “Course”-**

Course Title	Content
Web Programming	Python, CSS, JS

**What is the main problem/anomalies in the Course table?**

- a) Attribute name is not correct      b) Table is larger  
 c) Attribute has multiple value      d) It has functional dependency

**Ans: a**

**Note:** Attribute name is not correct because database attribute name in not supported space. So, correct attribute name is Course\_Title

6. Which is the immediate addressing mode in an 8086 microprocessor?

- a) MOV, AX, BX      b) MOV, AX, [BX]  
c) MOV AX, 1000      d) MOV Ax, [BX+1000]

**Ans: c**

**Note:** The addressing mode in which the data operand is a part of the instruction itself is known as immediate addressing mode. Example

MOV CX, 4929H, ADD AX, 2387H, MOV AL, FFH

7. Consider the following relation-

employee
ID
name
first_name
last_name
address
city
zip
birth_date
age()

Which is the opposite attribute in the "employee" relation?

- a) age, ID      b) birth\_date      c) name, address      d) name, age

**Ans: a**

8. Which information is not correct for any constructor of a java class?

- a) Constructor is not inherited      b) Constructor has no return type  
c) Constructor can be final      d) Constructor can be overloaded

**Ans: c**

**Note:** Rules for creating Java constructor-

- Constructor name must be the same as its class name
- A Constructor must have no explicit return type
- A java constructor cannot be abstract, static, final and synchronized

9. What will be the output of the given line?

printf("%d", sizeof(int));

- a) 2      b) 4      c) 1      d) 8

**Ans: b**

10. The collection of information stored in the database at a particular moment is called-

- a) Schema      b) Instance      c) Relation      d) Record

**Ans: b**

11. In a table an attribute named interest is defined as follows,

interest numeric (2,1)

When which one is the correct format for the interest columns?

- a) 65.2      b) 7.2      c) 19.02      d) 1.03

**Ans: b**

12. What is the disadvantage of multithreading?

- a) Share the same address space      b) Simultaneous access to multiple application  
c) Low cost communication      d) Difficulty in managing concurrency

**Ans: d**

**Note:** Disadvantages of a multithreading-

- Difficulty of writing code

**Question Bank**

- Difficulty of debugging
- Difficulty of managing concurrency
- Difficulty of testing
- Difficulty of porting existing code

**13. The time needs from the process arrival to the completion of that process is called**

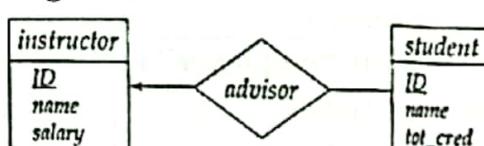
- a) Waiting time                                  b) Response time  
             c) Turnaround time                      d) Throughput

**Ans: c**

**Note:** Turnaround time is the total amount of time spent by the process from coming in the ready state for the first time to its completion. Turnaround time = Burst time + Waiting time or, Turnaround time = Exit time - Arrival time.

**14. We can create a “View” of a relation using the “create view\_name” command in SQL analyze the following information about view and find which option is correct-**

- a) view is not visible to user                      b) It is not a virtual table  
             c) it is not a part of the logical model        d) View cannot be updated

**Ans: c****15. A relationship is given below in an ER diagram How many tables can be created (preferred) from below diagram?**

- a) No definite numbers                              b) Two    c) Three    d) Two or Three

**Ans: d****16. Which information is wrong for Switch?**

- a) Stores MAC address table                      b) Operates at Data Link Layer  
             c) Forward the packet to intended computer      d) Has no memory

**Ans: d****17. Which one is the Data Control Language (DCL) in SQL?**

- a) Insert     b) Create     c) Drop    d) Grant

**Ans: d**

**Note:** DCL (Data Control Language) includes commands like GRANT and REVOKE, which are useful to give "rights & permissions." Other permission controls parameters of the database system.

**18. What is postfix expression of the string a+(b-c)\*d?**

- a) abc-d\*+    b) abcd-\*+    c) ad\*bc-    d) abc-d+\*

**Ans: a**

**Note:**  $a+(b-c)*d$   
      = a+bc-\* d                          [ <operand> <operator> <operator> ]  
      = a+bc-d\*  
      = abc-d\*+

**19. Which is not the state of a process in an Operating System?**

- a) New    b) Sleep    c) Terminated    d) Ready

**Ans: b**

**Note:** Processes in the operating system can be in any of the following states:

- NEW- The process is being created.
- READY- The process is waiting to be assigned to a processor.
- RUNNING- Instructions are being executed.

- WAITING- The process is waiting for some event to occur (such as an I/O completion or reception of a signal).
- TERMINATED- The process has finished execution.

**20. If we represent a binary tree using array, what will be the children of node "n"-**

- a)  $2n \& 2n+1$       b)  $2n \& 2-n$       c)  $(n+1)2$       d)  $2n \& 2n-1$

Ans: a

**21. Find the correct output-**

```
int a=10, b=20;
a^=b; b^=a; a^=b;
printf("%d%d", a, b);
```

- a) 20 30      b) 10 30      c) 20 10      d) Garbage Value

Ans: c

**22. Consider the following "staff" table**

staff_name	staff_dep	city
Riaz	CSE	Dhaka
Toha	EEE	Rajshahi

**What should be the query to find the output like "Riaz(CSE)" from the staff table?**

- a) select staff\_name || '|| staff\_dep ||' FROM staff where city= 'Dhaka'  
 b) select staff\_name '|| staff\_dep ||' FROM staff where city== 'Dhaka'  
 c) select staff\_name || '|| staff\_dep ||'|| FROM staff where city= 'Dhaka'  
 d) select staff\_name || '|| staff\_dep ||' FROM staff where city= 'Rajshahi'

Ans: c

**23. Among the following which is not a divisor of - (10010110111100000000)<sub>2</sub>?**

- a)  $(2)_{10}$       b)  $(64)_{10}$       c)  $(128)_{10}$       d)  $(256)_{10}$

Ans: d

**24. The \_\_\_\_\_ was the first wide-area packet-switching network with distributed control and one of the first networks to implement the TCP/IP protocol suite.**

- a) INTRANET      b) UCLA      c) CREN      d) ARPANET

Ans: d

**Note:** The ARPANET (an acronym for Advanced Research Projects Agency Network) was the first wide-area packet-switching network with distributed control and one of the first networks to implement the TCP/IP protocol suite. Both technologies became the technical foundation of the Internet.

**25. What is the output of this Java program?**

```
class Test {
    int i;
}
public class Main{
    public static void main(String args[]) {
        Test t=new Test();
        System.out.println(t.i);
    }
}
```

- a) The program will cause an compile error because the object "t" was not initialized  
 b) The program will cause an runtime exception because the variable "i" was not initialized  
 c) A garbage value      d) 0

Ans: d

## Question Bank

MCQ

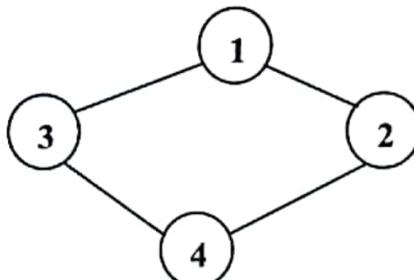
### 26. Which language was used to build Android Operating System?

- a) Java
- b) Python
- c) Kotlin
- d) Android is not an operating system

Ans: a

**Note:** The official language for Android development is Java. Large parts of Android are written in Java and its APIs are designed to be called primarily from Java.

### 27. In the following graph, determine the cost of the shortest path between node 1 to node 4



- a) 0
- b) 4
- c) -5
- d) -∞

Ans: d

### 28. Suppose, Y is an integer variable whose value is either 0 or 1. Which of the following is the equivalent of the statement: if (Y==0) Y=1; else Y=0; ?

- a) Y=1+Y
- b) Y=1-Y
- c) Y=Y-1
- d) Y=1%Y

Ans: d

### 29. Which one is the characteristics of Stack ADT?

- a) Sequential Index
- b) Last-In-First Out
- c) First-In-First Out
- d) Key indexing

Ans: b

**Note:** A stack is an Abstract Data Type (ADT), commonly used in most programming languages. Stack ADT allows all data operations at one end only. At any given time, we can only access the top element of a stack. This feature makes it LIFO data structure.

### 30. If you are told to remove the inconsistency from the course table which normalization technique you will use-

- a) 1NF
- b) 2NF
- c) 3NF
- d) BCNF

Ans: d

### 31. What is the maximum length of the “varchar” in the database?

- a) 35000
- b) 100
- c) 65535
- d) 255

Ans: c

**Note:** Values in VARCHAR columns are variable-length strings. The length can be specified as a value from 0 to 65,535. The effective maximum length of a VARCHAR is subject to the maximum row size (65,535 bytes, which is shared among all columns) and the character set used.

### 32. Which for loop statement is invalid?

- a) for(int x=10; k<=5; x+=2)
- b) for(int x=10; x>=2; --x)
- c) for(int x=10; x>=200; x=3\*x)
- d) for(int x=10; x>=0; x/9)

Ans: a

### 33. How many IP addresses can be assigned using IPv4 techniques?

- a)  $2^{32}$
- b)  $2^{64}$
- c)  $4^{32}$
- d)  $4^64$

Ans: a

**Note:** Internet Protocol version 4 provides  $2^{32}$  (4,294,967,296) addresses. However, large blocks of IPv4 addresses are reserved for special uses and are unavailable for public allocation.

34. In which tree structure left to right subtree height differs not more than 1?

- a) Binary tree      b) BST      c) AVL tree      d) Binary Heap      Ans: c

Note: AVL Tree can be defined as height balanced binary search tree in which each node is associated with a balance factor which is calculated by subtracting the height of its right subtree from that of its left sub-tree.

35. Assume that in a table named “student” the cgpa is calculated using the all course’s gpa. What kind of attribute cgpa is?

- a) Multivalued      b) Derived      c) Simple      d) Composite      Ans: b

Note: A derived data element is a data element derived from other data elements using a mathematical, logical or other type of transformation, e.g. arithmetic formula, composition, aggregation.

36. Which is the lightweight message format?

- a) XML      b) JSON      c) SQL      d) HTML      Ans: b

Note: JSON stands for JavaScript Object Notation. JSON is a lightweight format for storing and transporting data. JSON is often used when data is sent from a server to a web page.

37. What is wrong statements for SQL?

- a) Non-procedural language      b) Input can be several tables  
c) Output is always a single table      d) Output can be multiple table      Ans: d

38. The \_\_\_\_\_ operation, denoted by  $-$ , allows us to find tuples that are in one relation but are not in another.

- a) Union      b) Set-difference      c) Difference      d) Intersection      Ans: b

Note: The expression  $r - s$  produces a relation containing those tuples in  $r$  but not in  $s$ .

39. Why RAID is used in database storage?

- a) Improve performance      b) Reduce Cost  
c) Both a & b      d) None      Ans: c

Note: RAID or Redundant Array of Independent Disks, is a technology to connect multiple secondary storage devices and use them as a single storage media.

40. Which is not the steps of SQL query processing?

- a) Parsing      b) Translation      c) Optimization      d) None      Ans: d

Note: Query Processing is the activity performed in extracting data from the database. In query processing, it takes various steps for fetching the data from the database. The steps involved are:

- Parsing and translation
- Optimization
- Evaluation

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1. Which of the following is not a web server attack type?

- a) DOS attack                          b) Website Defacement using SQLi  
c) Directory Traversal                d) Password guessing

Ans: d

**Note:** The web servers are actually computers running that makes us available & accessible files (web pages) through the internet. Different web server attack types are through DOS attack, website defacement using SQLi and directory traversal.

2. The \_\_\_\_\_ loop is especially useful when you process a menu selection?

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

Ans: b

**Note:** The do-while loop is similar to the while loop with one important difference. The body of do-while loop is executed at least once. Only then, the test expression is evaluated. The syntax of the do...while loop is:

```
do {  
    // statements inside the body of the loop  
}  
while (testExpression);
```

3. Which file format can be added to a PowerPoint show?

- a) .jpg                                b) .gif                                c) .wav                                d) All of the above

Ans: d

**Note:** All of options file format can be added to a PowerPoint show.

4. Which shortcut key on the keyboard can be used to view slide show?

- a) F1                                    b) F7                                    c) F5                                    d) F12

Ans: c

**Note:**

- F1: Opens the Help pane.
- F5: Starts the slideshow at the first slide and displays it in full-screen mode.
- Shift+F5: Starts the slideshow at the current slide.
- F7: Runs spellcheck.
- F12: Opens the Save As dialog box.

5. Multiple calculation can be made in a single formula using.

- a) Standard Formula                b) Array Formula  
c) Complex Formula                 d) Smart Formula

Ans: b

**Note:** An array formula is a formula that can perform multiple calculations on one or more of the items in an array. We can think of an array as a row of values, a column of values, or a combination of rows and columns of values. Array formulas can return either multiple results or a single result. For example, we can create an array formula in a range of cells and use the array formula to calculate a column or row of subtotals. We can also place an array formula in a single

cell and calculate a single amount. An array formula that includes multiple cells is called a multi-cell formula, and an array formula in a single cell is called a single-cell formula.

**6. The \_\_\_\_\_ block used to execute a given set of the statement whether the exception is thrown or not.**

- a) try      b) tryif      c) finally      d) thrown

**Ans: c**

**Note:** The Finally block is used to execute a given set of statements, whether an exception is thrown or not thrown. For example, if open a file, it must be closed whether an exception is raised or not.

**7. Which area in an excel window allow entering values and formulas?**

- a) Title bar      b) Menu bar  
c) Formula bar      d) Standard tool bar

**Ans: c**

**Note:** Formula Bar area in an Excel window allows entering values and formulas. Formula Bar is a toolbar at the top of the Microsoft Excel spreadsheet window that we can use to enter or copy an existing formula in to cells or charts. It is labeled with function symbol (fx). By clicking the Formula Bar, or when you type an equal (=) symbol in a cell, the Formula Bar will activate.

**8. Java uses a keyword \_\_\_\_\_ to preface a block of code that is likely to cause an error condition and ‘throw’ an exception.**

- a) throw      b) catch      c) finally      d) try

**Ans: d**

**Note:** The try statement allows to define a block of code to be tested for errors while it is being executed. The catch statement allows to define a block of code to be executed, if an error occurs in the try block.

**9. Which of the following method(s) not included in InputStream class?**

- a) available()      b) reset()      c) flush()      d) close()

**Ans: c**

**Note:** The Java.io.InputStream class is the superclass of all classes representing an input stream of bytes. Applications that need to define a subclass of InputStream must always provide a method that returns the next byte of input.

**Class methods:**

- available()
- close()
- mark(int readlimit)
- markSupported()
- read()
- reset()

**10. A proxy firewall filters at \_\_\_\_\_.**

- a) Physical layer      b) Data link layer  
c) Network layer      d) Application layer

**Ans: d**

**Note:** The application firewall is typically built to control all network traffic on any layer up to the application layer. It is able to control applications or services specifically, unlike a stateful network firewall, which is without additional software unable to control network traffic regarding a specific application. There are two primary categories of application firewalls, network-based application firewalls and host-based application firewalls.

**11. Virtual memory located on:**

- a) RAM      b) CPU      c) Flash drive      d) Hard drive

**Ans: d**

**Note:** Virtual memory typically located on Hard drive.

**12. A number of signal can be carried simultaneously if each signal is modulated that a different carried frequency called:**

- a) TDM
- b) FDM
- c) Frequency modulation
- d) Pulse modulation

**Ans: b**

**Note:** Frequency-division multiplexing (FDM) is a technique by which the total bandwidth available in a communication medium is divided into a series of non-overlapping frequency bands, each of which is used to carry a separate signal. This allows a single transmission medium such as a cable or optical fiber to be shared by multiple independent signals. Another use is to carry separate serial bits or segments of a higher rate signal in parallel.

**13. Convert the binary number  $(1011010)_2$  into hexadecimal?**

- a) 5B
- b) 5F
- c) 5A
- d) 5C

**Ans: c**

**Note:**

$$\begin{array}{r} 0101 \ 1010 \\ \downarrow \quad \downarrow \\ 5 \quad 10 \ (\text{A}) \end{array}$$

**14. Which of the data structure is linear type?**

- a) Tree
- b) Binary Tree
- c) Queue
- d) Graph

**Ans: c**

**Note:** Data structure where data elements are arranged sequentially or linearly where the elements are attached to its previous and next adjacent in what is called a linear data structure. Linear data structures are easy to implement because computer memory is arranged in a linear way. Its examples are array, stack, queue, linked list etc.

**15. If List= [1,2,3,4,5] and write List[3] = List[1] then what will be List[3]?**

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

**Ans: c**

**16. In programming language DRY principle makes the code.**

- a) reusable
- b) loop forever
- c) repetitive
- d) complex

**Ans: a**

**Note:** DRY inherently promotes reuse of code because we are merging 2 or more instances of repeating code into a single block of code. Reusable code pays off in the long run as it speeds development time.

**17. K nearest neighbor algorithm is part of:**

- a) Clustering algorithm
- b) classification algorithm
- c) association algorithm
- d) None of these

**Ans: b**

**Note:** The k-nearest neighbors (KNN) algorithm is a simple, supervised machine learning algorithm that can be used to solve both classification and regression problems.

**18. If the class levels of training data set are unknown in machine learning, then it is called:**

- a) classification
- b) clustering
- c) association
- d) reinforcement learning

**Ans: a**

**Note:** There are two main types of supervised learning problems: they are classification that involves predicting a class label and regression that involves predicting a numerical value.

**Question Bank**

**19. Communication path between a computer microprocessor and main memory is called:**

- a) system bus      b) ISA bus      c) PCI bus      d) local bus

**Ans: a**

**Note:** The system bus is a pathway composed of cables and connectors used to carry data between a computer microprocessor and the main memory. The bus provides a communication path for the data and control signals moving between the major components of the computer system.

**20. Ice Lake CPU is intel's code name for the processor of:**

- a) 11<sup>th</sup> generation      b) 8<sup>th</sup> generation  
c) 9<sup>th</sup> generation      d) 10<sup>th</sup> generation

**Ans: d**

**Note:** Ice Lake is Intel's codename for the 10th generation Intel Core mobile processors based on the new Sunny Cove Core microarchitecture. Ice Lake represents an Architecture step in Intel's Process-Architecture-Optimization model.

**21. In core i7-8650U processor, here U means:**

- a) Ultra low power      b) Ultra high power  
c) Upgrade version      d) Upgrade processor

**Ans: c**

**22. Smallest unit of bit coin is called:**

- a) unit coin      b) satoshis      c) etherum      d) litecoin

**Ans: b**

**Note:** The satoshi is the smallest unit of the bitcoin cryptocurrency. It is named after Satoshi Nakamoto, the creator of the protocol used in blockchains and the bitcoin cryptocurrency. The satoshi to bitcoin ratio is 100 million satoshis to one bitcoin.

**23. Which is not pipeline hazard?**

- a) Resource hazard      b) Control hazard  
c) Address hazard      d) Data hazard

**Ans: c**

**Note:** There are three classes of hazards:

- **Structural Hazards:** Also known as Resource hazard. They arise from resource conflicts when the hardware cannot support all possible combinations of instructions in simultaneous overlapped execution.
- **Data Hazards:** They arise when an instruction depends on the result of a previous instruction in a way that is exposed by the overlapping of instructions in the pipeline.
- **Control Hazards:** They arise from the pipelining of branches and other instructions that change the PC.

**24. In a block chain, a bundle of transaction is called:**

- a) node      b) block      c) chain      d) nonce

**Ans: b**

**Note:** Blocks are the components that bundle a set of transactions and distribute them among each node of a blockchain network. Miners create these blocks.

**25. The processor reads an instruction from memory is called:**

- a) Interpret instruction      b) Fetch instruction  
c) Read instruction      d) Fetch data

**Ans: b**

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**Note:** Fetch instruction: The CPU reads an instruction from memory. Interpret instruction: The instruction is decoded to determine what action is required. Fetch data: The execution of an instruction may require reading data from memory or an I/O module.

**26. A branch office, location or other data processing centers, where a newly developed system is used under normal operating conditions for several months, to test it, is called:**

- a) Beta test data
- b) String test data
- c) Alpha test data
- d) System test data

Ans: a

**Note:** A beta test is a type of testing period for a computer product prior to any sort of commercial or official release. Beta testing is considered the last stage of testing, and normally involves distributing the product to beta test sites and individual users ("beta testers") outside the company for real-world exposure.

**27. Microprocessor reference that are available in the cache are called \_\_\_\_\_:**

- a) Cache hits
- b) Cache line
- c) Cache memory
- d) All of these

Ans: a

**28. If any error occurs due to violation of programming rule is \_\_\_\_\_.**

- a) Syntax error
- b) Run-time Errors
- c) Linker Errors
- d) Logical Errors

Ans: a

**Note:** Errors that occur when violate the rules of writing C/C++ syntax are known as syntax errors. This compiler error indicates something that must be fixed before the code can be compiled. All these errors are detected by compiler and thus are known as compile-time errors.

**29. Running the given task in less time by increasing the degree of parallelism in DBMS is called \_\_\_\_\_.**

- a) scale up
- b) roll up
- c) speedup
- d) Data Warehouse

Ans: a

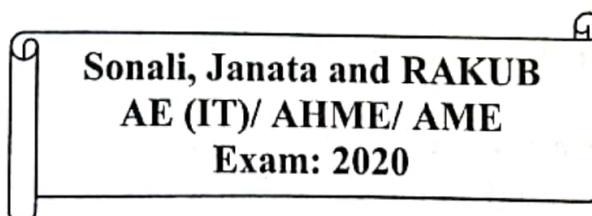
**Note:** Parallelism is used to provide scale-up, where increasing workloads are managed without increase response-time, via an increase in the degree of parallelism.

**30. The most common use of \_\_\_\_\_ in OOP occurs when a parent class reference is used to refer to a child class object.**

- a) Polymorphism
- b) Inheritance
- c) Encapsulation
- d) Method overriding

Ans: a

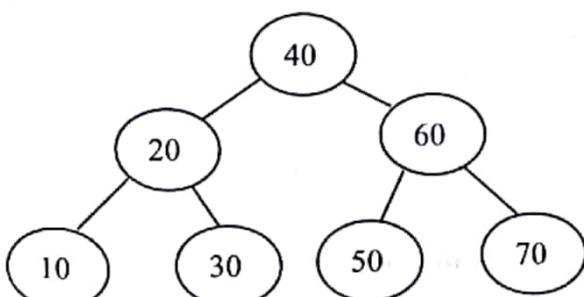
**Note:** Polymorphism is the ability of an object to take on many forms. The most common use of polymorphism in OOP occurs when a parent class reference is used to refer to a child class object.



**1. With zero volts on both inputs, what is the ideal output of an Operational Amplifier?**

- a) Equal to Zero                         b) Same as positive input voltage  
 c) None of the above                      d) Same as negative input voltage          Ans: a
2. A technician testing a logic circuit sees that the output of a particular INVERTER is stuck LOW while its input is pulsing. Which one of the following is the possible reason for this faulty operation?  
 a) The output of the INVERTER is internally grounded  
 b) The output of the INVERTER is externally grounded  
 c) The input being driven by output of the INVERTER is internally grounded  
 d) All of the above                        Ans: c
3. Which of the following memory devices is not reprogrammable?  
 a) Flash memory    b) ROM            c) EPROM          d) EEPROM                        Ans: b
4. Consider the activities A1, A2 and A3 related to email:  
**A1:** Send an email from a mail client to a mail server  
**A2:** download an email from mailbox server to a mail client  
**A3:** Checking email in a web browser
- Which is the application level protocols used in each activity?  
 a) A1: HTTP A2: SMTP A3: POP    b) A1: SMTP A2: FTP A3: HTTP  
 c) A1: SMTP A2: POP A3: HTTP    d) A1: POP A2: SMTP A3: IMAP          Ans: c
- Note:** SMTP is used by user client to send mail, POP is used to download in mailbox from mail sever and checking mail using browser simply uses HTTP.
5. Which of the following is the role of Certification Authority (CA) in electronic commerce using public key encryption?  
 a) To manage a private key shared among the parties to the transaction.  
 b) To manage digital signatures of the parties to the transaction  
 c) To manage the passwords of the parties to the transaction  
 d) To issue a digital certificate for the public key of the parties to the transaction    Ans: d
6. The pre order traversal of binary tree is 40, 20, 10, 30, 60, 50, 70. Which one of the is the postorder traversal of the tree?  
 a) 10,20,30,40,50,60,70                              b) 10,30,20,50,70,60,40  
 c) 40,20,60,10,30,50,70                              d) 70,50,60,30,10,20,40                        Ans: b

Note:



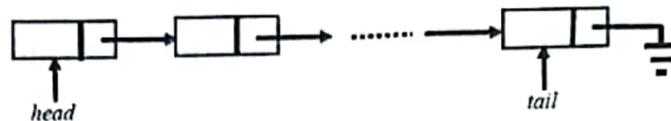
- (a) Inorder (Left, Root, Right)
- (b) Preorder (Root, Left, Right)
- (c) Postorder (Left, Right, Root)

Now,  
 Postorder: 10,30,20,50,70,60,40

## Question Bank

MCQ

7. Suppose you are implementing a Queue of size N using a non-circular linked list having a front and a rare pointer as shown in the figure. The enqueue operation inserts a new node at the front and the dequeue operation deletes a node from the rare. Which one of the following is the time complexity of the most efficient implementation of the enqueue and dequeue operations, respectively on this data structure?



- a)  $\theta(1), \theta(1)$       b)  $\theta(1), \theta(n)$       c)  $\theta(n), \theta(1)$       d)  $\theta(n), \theta(n)$

Ans: b

Note: For Enqueue operation, performs in constant amount of time (i.e.,  $\theta(1)$ ), because it modifies only two pointers, i.e.,

Create a Node P.

P->Data = Data

P->Next = Head

Head = P

For Dequeue operation, we need address of second last node of single linked list to make NULL of its next pointer. Since we cannot access its previous node in singly linked list, so need to traverse entire linked list to get second last node of linked list, i.e.,

```
temp = head;
While (temp->Next->Next != NULL) {
    temp = temp->Next;
}
temp->next = NULL;
Tail = temp;
```

Since, we are traversing entire linked for each Dequeue, so time complexity will be  $\theta(n)$ .

8. Which device converts mechanical energy into electrical energy?

- a) Solar cell      b) Motor      c) Generator      d) Chemical cell

Ans: c

Note: Electric generator, also called dynamo, any machine that converts mechanical energy to electricity for transmission and distribution over power lines to domestic, commercial and industrial customers. Generators also produce the electrical power required for automobiles, aircraft, ships and trains.

9. Which protocol dynamically assigns IP addresses in a TCP/IP network?

- a) ARP      b) RIP      c) SMTP      d) DHCP

Ans: d

Note: Dynamic Host Configuration Protocol (DHCP) is a protocol that will automatically assign TCP/IP addressing information to workstations over the network. The most common options set by DHCP are the network address, subnet mask, gateway and DNS server address.

10. Using Loopbacks (plug) which task can be done from the given list?

- a) measuring voltage      b) Test serial and parallel port  
c) Check series connectivity      d) Check resistivity

Ans: c

**11. #include<stdio.h>**

```
struct Testnode{  
    char x,y,z;  
}  
int main(){  
    struct Testnode node1 = {'1','2','c+3'};  
    struct Testnode node2 = &node1;  
    printf("%c,%c",*((char*)node2+1),*((char*)node2+2));  
    return 0;  
}
```

**Which one is the output of the above program?**

- a) 0, f      b) 0, c+3      c) '0', 'c+6'      d) '0', 'f'

**12. Which of the following is an attack that threatens the integrity of information?**

- a) Falsification of web pages      b) Illegal copy of data stored in system  
c) DoS attack that creates system overload  
d) Wiretapping of communication contents

**Ans: a****13. Which of the following is a package of unauthorized programs and tools that has functions to create a back door in a server and hide the trace of entry into the server?**

- a) RFID      b) Rootkit      c) TKIP      d) web beacon

**Ans: b**

**Note:** A Rootkit is a malicious software that allows an unauthorized user to have privileged access to a computer and to restricted areas of its software. A rootkit may contain a number of malicious tools such as keyloggers, banking credential stealers, password stealers, antivirus disablers and bots for DDoS attacks.

**14. What is/are the main operation of SSL/TLS?**

- a) Encrypt packet in Data Link Layer      b) Check error in Network Layer  
c) Ensure data security in Transport Layer      d) All of above

**Ans: d**

**Note:** SSL and TLS are both cryptographic protocols used to increase security by encrypting communication over computer networks. SSL (RFC specification) stands for Secure Sockets Layer while TLS (RFC specification) stands for Transport Layer Security. A cryptographic protocol must adhere to certain requirements in order to be deemed secure. Ultimately, both SSL and TLS protocols offer one or more of the following properties:

- The connection is private due to encryption.
- The identity of the peer can be authenticated using public key cryptography.
- Each message transmitted includes a message integrity check to ensure the connection is reliable.

**15. URL stands for-**

- a) Universal Resource Locator      b) Uniform Resource Locator  
c) Unique Resource Locator      d) None

**Ans: b**

## Question Bank

**Note:** A Uniform Resource Locator, colloquially termed a web address, is a reference to a web resource that specifies its location on a computer network and a mechanism for retrieving it. A URL is a specific type of Uniform Resource Identifier, although many people use the two terms interchangeably.

### 16. How much data a flip flop can store?

- a) 4-bit data      b) 1-bit data      c) 3-bit data      d) 3-bit data

**Ans: b**

**Note:** A flip flop stores one bit of data. It is set (1) or Reset (0). A register is a bank of flip flops with a common purpose (data, address, or some value).

### 17. $\overline{ABC}(\overline{A} + \overline{B} + \overline{C})$ Which is the simplified form of this?

- a)  $\overline{A} + \overline{B} + \overline{C}$       b)  $\overline{A}\overline{B}\overline{C}$       c)  $\overline{ABC}$       d)  $\overline{\overline{ABC}}$

**Ans: a & c**

**Note:**  $\overline{ABC}(\overline{A} + \overline{B} + \overline{C}) = \overline{ABC} \cdot \overline{ABC} [\because \overline{A} + \overline{B} = \overline{AB}] = \overline{ABC}$  [A.A=A]

### 18. Which is not a type of DNS attack?

- |                           |                             |
|---------------------------|-----------------------------|
| a) Cache Poisoning Attack | b) Denial of Service Attack |
| c) DNS spoofing           | d) CSRF attack              |

**Ans: d**

**Note:** Types of DNS attacks-

- Domain hijacking
- DNS flood attack
- Distributed Reflection Denial of Service
- Cache poisoning
- DNS tunneling
- DNS Spoofing
- Random subdomain attack
- NXDOMAIN attack
- Phantom domain attack

### 19. Which is the disadvantage of Optical Fiber?

- |                                      |                                |
|--------------------------------------|--------------------------------|
| a) Resistance to corrosive materials | b) Greater immunity to tapping |
| c) Unidirectional light propagation  | d) None of these               |

**Ans: d**

**Note:** An optical fiber cable is a type of cable that has a number of optical fibers bundled together, which are normally covered in their individual protective plastic covers. Optical cables are used to transfer digital data signals in the form of light up to distances of hundreds of miles with higher throughput rates than those achievable via electrical communication cables. All optical fibers use a core of hair-like transparent silicon covered with less refractive indexed cladding to avoid light leakage to the surroundings. Due to the extreme sensitivity of the optical fiber, it is normally covered with a high-strength, lightweight protective material like Kevlar.

### 20. Related records of the different relations can be stored on the same block using which file organization technique?

- |                              |                                 |
|------------------------------|---------------------------------|
| a) Heap file organization    | b) Sequential file organization |
| c) Hashing file organization | d) Clustering file organization |

**Ans: d**

**Note:** Clustered file organization is not considered good for large databases. In this mechanism, related records from one or more relations are kept in the same disk block, that is, the ordering of records is not based on primary key or search key.

**Question Bank****21. Which one is the text based web browser?**

- a) Chrome      b) Lynx      c) Safari      d) Microsoft Edge      **Ans: b**

**Note:** Lynx, the oldest text-based browser, is known for being highly customizable and widely available for most of the operating systems – Windows, Linux etc. Unlike many browsers, Lynx does not support JavaScript and graphics, so users can access websites and scroll the Internet without privacy concerns. Features like using cursors for highlighting links and having numbered pages are some key highlights of Lynx.

**22. Which one is not a layer of cloud computing?**

- a) Computing as a service (CaaS)      b) Infrastructure as a service (IaaS)  
 c) Platform as a service (PaaS)      d) Software as a service (SaaS)      **Ans: a**

**23. Which one of the following have higher bandwidth?**

- a) Shielded Twisted Pair      b) Unshielded Twisted Pair  
 c) Coaxial Cables      d) Fiber Optic Cables      **Ans: d**

**Note:** Fiber-Optic cabling is a glass cabling media that sends network signals using light. Fiber-optic cabling has higher bandwidth capacity than copper cabling and is used mainly for high-speed network Asynchronous Transfer Mode (ATM) or Fiber Distributed Data Interface (FDDI) backbones, long cable runs and connections to high-performance workstations.

**24. A sine wave is offset  $\frac{1}{6}$  cycle with respect to time 0. What is its phase in degrees and radians?**

- a)  $60^\circ$  and 1.046 rad      b)  $30^\circ$  and 0.5236 rad  
 c)  $90^\circ$  and 2.046 rad      d)  $360^\circ$  and 6.2832 rad      **Ans: a**

**Note:** We know that 1 complete cycle is  $360^\circ$ . Therefore,  $\frac{1}{6}$  cycle is-

$$= \frac{1}{6} \times 360 = 60^\circ = 60 \times \frac{2\pi}{360} \text{ rad} = \frac{\pi}{3} \text{ rad} = 1.046 \text{ rad}$$

**25. Which one is the bandwidth for a signal transmitting at 12 Mbps for QPSK (d=0)?**

- a) 2MHz      b) 4MHz      c) 6 MHz      d) None of the above      **Ans: c**

**Note:** For QPSK, 2 bits is carried by one signal element. This means that  $r=2$ . So the signal rate(baud rate) is  $S=N \times \frac{1}{r} = 6$  baud. With a value of  $d=0$ , we have  $B=S=6$  MHz.

**26. There is a RAM issue on a PC/laptop. Which of the following symptom(s) might be an indication of RAM issue?**

- a) PC frequently freezes, reboots      b) Wrong BIOS time  
 c) Function keys are not working properly      d) All of them      **Ans: d**

**27. The Bangladesh Bank robbery, also known as the Bangladesh bank cyber heist, was a theft that took place in February 2016. The governor of the central bank engaged \_\_\_\_\_ to lead the security incident response, vulnerability assessment and remediation.**

- a) Fortinet Cyber Security      b) Zacco Cybersecurity Research Lab  
 c) Palo Alto Networks      d) World Informatix Cyber Security      **Ans: d**

**Question Bank**

**28. The BNC connector is a miniature quick connect/disconnect connector that is used for \_\_\_\_\_ cable.**

- a) Ribbon Electric
- b) Shielded/Twisted Pair
- c) Coaxial
- d) Fibre Optics

Ans: c

**Note:** The BNC (Bayonet Neill-Concelman) connector is a miniature quick connect/disconnect radio frequency connector used for coaxial cable.

**29. \_\_\_\_\_ is the technique of hiding secret data within an ordinary, non-secret, file or message in order to avoid detection; the secret data is then extracted at its destination.**

- a) Cryptography Proper
- b) Steganography
- c) Overt Writing
- d) Coding

Ans: b

**Note:** Steganography is the technique of hiding secret data within an ordinary, non-secret, file or message in order to avoid detection; the secret data is then extracted at its destination.

**30. A solid-state drive (SSD) is a newer, faster type of device that stores data on instantly-accessible \_\_\_\_\_.**

- a) Ultra Magnetic Chip
- b) Integrated Circuit
- c) Random Access Memory
- d) High Bandwidth memory

Ans: c

**31. What is the current popular technology for Maintaining smooth Wi-Fi performance and throughput for gaming, video streaming, and smart home devices?**

- a) Wi-Fi Star Network Systems
- b) Wi-Fi Bus Network Systems
- c) Wi-Fi Mesh Network Systems
- d) Wi-Fi Ring Network Systems

Ans: c

**Note:** The Best Wi-Fi Mesh Network Systems is now that working from home is just as important as gaming and streaming, defeating Wi-Fi dead zones is more important than ever. That's where multi-node mesh systems shine. Here are the best Wi-Fi mesh network systems we've tested.

**32. Handshaking procedure takes place in \_\_\_\_\_.**

- a) TCP
- b) UDP
- c) ARP
- d) Both A and B

Ans: a

**33. What is the minimum value that can be stored accurately in a 32-bit signed integer of C programming language?**

- a) 0
- b)  $-2^{31}$
- c)  $-2^{31}-1$
- d)  $-2^{32}$

Ans: c

**Note:** The C standard provides guidelines specifying the minimum allowable size for each basic data type. The minimum range for both short and int is -32,767 to 32,767, corresponding to a 16-bit unit, and the minimum range for long is -2,147,483,647 to 2,147,483,647, corresponding to a 32-bit unit.

**34. Suppose we have a Binary Search Tree where each node has an integer value. Which of the following tree traversal techniques can give us a sorted list (in ascending order) of those integers?**

- a) Pre-order traversal
- b) In-order traversal
- c) Post-order traversal
- d) BFS traversal

Ans: b

35. Which of the following techniques/algorithms cannot be used to detect cycles in an undirected and unweighted graph?

N.B: A cycle in a graph refers to a path where the starting and ending vertex is same.

- a) Disjoint Set Data Structure
- b) Breadth First Search
- c) Depth First Search
- d) Floyd-Warshall algorithm

**Ans: d**

36. Which of the following languages causes 'Indentation Errors' for not using tabs properly?

- a) JavaScript
- b) Python
- c) Java
- d) Ruby

**Ans: b**

**Note:** Python is a language and is used for varied applications. Python is a language where the code is arranged through whitespaces. If there is incorrect indentation this will result in an error and the python interpreter will just return an error function.

37. \_\_\_\_\_ is the final stage of the testing process conducted before software release. This is referred as:

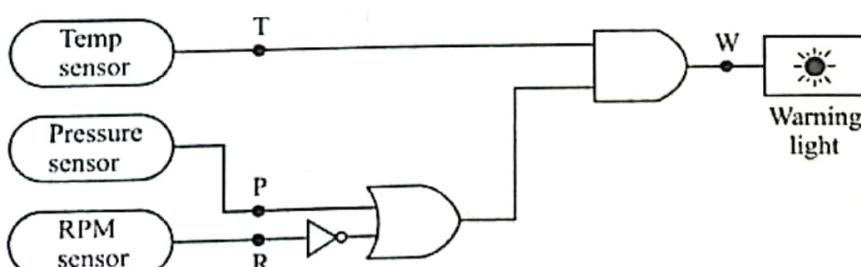
- a) Alpha testing
- b) Beta testing
- c) Gamma testing
- d) Delta testing

**Note:** Alpha Testing is a type of software testing performed to identify bugs before releasing the software product to the real users or public. It is a type of acceptance testing. The main objective of alpha testing is to refine the software product by finding and fixing the bugs that were not discovered through previous tests.

38. A jet Aircraft employs a system for monitoring the rpm, pressure and temperature values of its engines using sensors that operate as follows:

- |                               |                                   |
|-------------------------------|-----------------------------------|
| RPM sensor (R) output         | = 0 only when speed < 4800 rpm    |
| Pressure sensor (P) output    | = 0 only when pressure < 220 psi  |
| Temperature sensor (T) output | = 0 only when temperature < 200°F |

Following figure shows the logic circuit that controls a cockpit warning light for certain combinations of engine conditions. Assume that a HIGH at the output W activates the warning light. What engine condition will give a warning to the pilot?

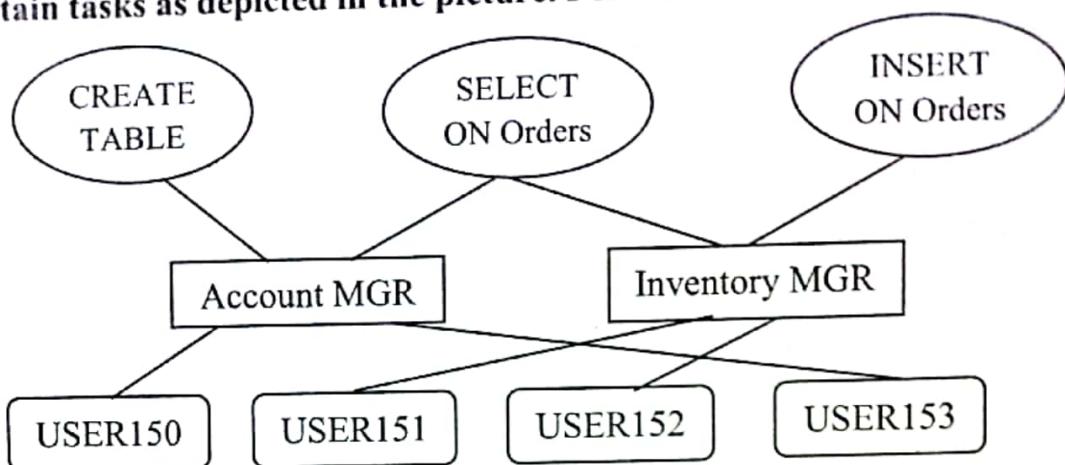


- a) Temperature (T) is > 200°F and pressure (P) > 220 psi
- b) Temperature (T) is > 200°F and speed (R) < 4800 rpm
- c) Option (a) and (b)
- d) None of the above

**Ans: c**

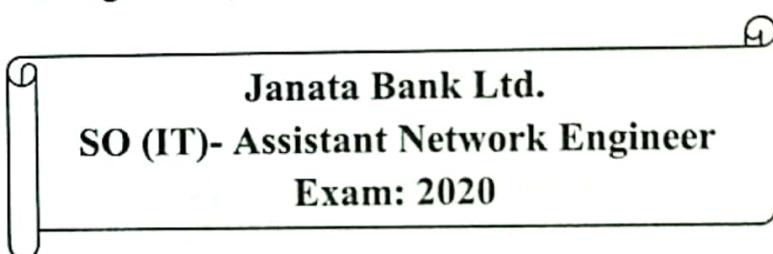
**Question Bank**

39. USER150, USER153 can do certain tasks and USER151, USER152 can also do certain tasks as depicted in the picture. For this reason, two \_\_\_\_\_ have been created.



- a) Roles      b) Privileges      c) Functions      d) Stord Procedures

Ans: d



1. Which is the correct output?

```

int i = 4;
printf ("%d%d", ++i, i++);
printf ("%d ", i++);
  
```

- a) 5 4 6      b) 5 7 8      c) 6 4 6      d) 4 5 7

Ans: c

2. Which is not the feature of JAVA OOP?

- a) Multiple Inheritance      b) Multi-level inheritance  
c) Compile time Polymorphism      d) Runtime Polymorphism

Ans: a

**Note:** OOPs concept brings this data and behavior in a single place called “class” and we can create any number of objects to represent different state for each object. Object-oriented programming System(OOPs) is a programming paradigm based on the concept of “objects” that contain data and methods. The primary purpose of object-oriented programming is to increase the flexibility and maintainability of programs. Object oriented programming brings together data and its behavior(methods) in a single location(object) makes it easier to understand how a program works

3. If you are assigned to remove partial dependency from a database, which technique you will use?

- a) INF      b) 2NF      c) 3NF      d) BCNF

Ans: b

**Note:** Partial Dependency occurs when a non-prime attribute is functionally dependent on part of a candidate key. The 2nd Normal Form (2NF) eliminates the Partial Dependency.

4. Suppose you have a complete undirected graph with 4 nodes. What is the maximum number of minimum Spanning Tree (MST) you can from?

- a) 4      b) 8      c) 16      d) 1

**Ans: a**

5. Which one of the following is the default port of HTTP?

- a) 23      b) 25      c) 80      d) 45

**Ans: c**

**Note:** Port numbers are sometimes seen in web or other uniform resource locators (URLs). By default, HTTP uses port 80 and HTTPS uses port 443, but a URL like <http://www.example.com:8080/path/> specifies that the web browser connects instead to port 8080 of the HTTP server.

6. What will be the state of a queue after executing the following operation?

push(1), push(2), push(3), pop(), push(4), push(5), pop()

- a) 2, 5      b) 2, 4      c) 4, 5      d) 1, 4

**Note:** No matching output.

7. Which one is wrong statement for BIOS of a computer?

- a) Connect microprocessor and I/O      b) Manages data flow  
c) Loads the operating system      d) Provide storage

**Ans: a**

**Note:** BIOS connects OS and microprocessor

8. DHCP means?

- a) Dynamic Host Control Protocol      b) Domain Host Configuration Protocol  
c) Distributed Host Configuration Protocol      d) Dynamic Host Configuration Protocol

**Ans: d**

**Note:** A DHCP Server is a network server that automatically provides and assigns IP addresses, default gateways and other network parameters to client devices. It relies on the standard protocol known as Dynamic Host Configuration Protocol or DHCP to respond to broadcast queries by clients.

9. Which one is not Database Transaction property?

- a) Atomicity      b) Consistency      c) Durability      d) Quality

**Ans: d**

**Note:** Atomicity, Durability and Consistency are all properties of transactions.

10. How many bits in IPv6?

- a) 32      b) 64      c) 128      d) 156

**Ans: c**

**Note:** An IPv6 address is 128 bits in length and consists of eight, 16-bit fields, with each field bounded by a colon. Each field must contain a hexadecimal number, in contrast to the dotted-decimal notation of IPv4 addresses.

11. How can we prevent SQL Injection Attack?

- a) Show the database error to the users      b) Use input validation  
c) Use the user input directly      d) Do not remove potential malicious code

**Ans: d**

12. A complex bandpass signal has a bandwidth of 300kHz. What is the minimum sampling rate for this signal?

**Question Bank**

- a) 600,000 samples per second  
c) 600kHz

- b) 600,00 samples per second  
d) None of the above

Ans: d

**Note:** We cannot find the minimum sampling rate in this case because we do not know where the bandwidth starts or ends. We do not know the maximum frequency in the signal.

**13. The human voice normally contains frequencies from 0 to 4000Hz. If bits per sample?**

- a) 8000 samples/second  
c) 64kbps

- b) 8000kbps  
d) 64 samples/second

Ans: c

**Note:** The human voice normally contains frequencies from 0 to 4000Hz. So the sampling rate and bit rate are calculated as follows:

$$\text{Sampling rate} = 4000 \times 2 = 8000 \text{ samples/s}$$

$$\text{Bit rate} = 8000 \times 8 = 64,000 \text{ bps} = 64 \text{ kbps}$$

**14. Which one is the loopback address?**

- a) 255.255.2550    b) 127.0.0.1    c) 255.0.0.0    d) 127.127.127.0

Ans: b

**Note:** A loopback address is a special IP address, 127.0.0.1, reserved by Inter NIC for use in testing network cards. This IP address corresponds to the software loopback interface of the network card, which does not have hardware associated with it, and does not require a physical connection to a network.

**15. Which one is not the purpose of modulation in a communication system?**

- a) To reduce antennas size    b) To saves energy to transmit information  
c) To transmit signals from various sources  
d) To make the system simpler and cost effective

Ans: a

**Note:** Following are some of the advantages for implementing modulation in the communication systems.

- Antenna size gets reduced.
- No signal mixing occurs.
- Communication range increases.
- Multiplexing of signals occur.
- Adjustments in the bandwidth is allowed.
- Reception quality improves.

**16. Five channels, each with a 100-kHz bandwidth, are to be multiplexed together. What is the minimum bandwidth of the link if there is a need for a guard band of 5 kHz between the channels to prevent interference?**

- a) 500 kHz    b) 520 kHz    c) 540 kHz    d) 525 kHz

Ans: b

**Note:** For five channels, we need at least four guard bands. This means that the required bandwidth is at least  $5 \times 100 + 4 \times 5 = 520 \text{ kHz}$ .

**17. Assume we need to download text documents at the rate of 100 pages per sec. Each page contains an average of 24 lines with 80 characters in each line. If we assume that one character requires 8 bit, what is the required bit rate of the channel?**

- a) 1.92 Mbps    b) 1.636Mbps    c) 1.82 Mbps    d) 1.56Mbps

Ans: d

**Note:** We have 100 pages, each page is having 24 line and in each line there are 80 character and each character is of 8 bits. Now we have to calculate no of bits can be downloaded: i.e. Downloading rate = 100 pages

$$\begin{aligned} &= 100 \text{ pages} \times 24 \text{ line} \times 80 \text{ character} \times 8 \text{ bits} \\ &= 1536000 \text{ bits per second} = 1.536 \text{ Mbps.} \end{aligned}$$

**18. Consider an extremely noisy channel in which the value of the signal-to-noise ratio is almost zero. For this channel, if the bandwidth is B then what is the channel capacity?**

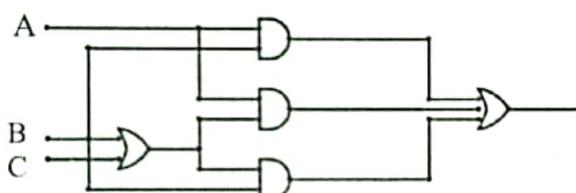
- a)  $0.137B$       b) 0      c)  $0.137$       d) Infinity      **Ans: b**

**Note:**  $C = B \log_2 (1+SNR) = B \log_2 (1+0) = B \log_2 1 = B \times 0 = 0$ . This means that the capacity of this channel is zero regardless of the bandwidth. In other words, we cannot receive any data through this channel.

**19. A binary counter is being pulsed by a 256 kHz. Which one of the following is the counting range?**

- a) 0 to 255      b) 0 to 128      c) 0 to 127      d) None of the above      **Ans: a**

**20. Which one is the output of the following digital logic circuit?**



- a)  $AB + A(B+C) + C(B+C)$       b)  $AB + A(B+C) + B(B+C)$   
 c)  $AC + A(B+C) + B(B+C)$       d)  $BC + C(B+C) + B(B+C)$       **Ans: b**

**21. When a web browser interacts with a web server, the following actions take place?**

- A1: The web browser requests a webpage using HTTP.  
 A2: The web browser establishes a TCP connection with the web server.  
 A3: The web server sends the requested webpage using HTTP.  
 A4: The web browser resolves the domain name using DNS.

**Which is the correct order of execution of the above actions?**

- a) A4, A2, A1, A3      b) A1, A2, A3, A4  
 c) A4, A1, A2, A3      d) A2, A4, A1, A3      **Ans: c**

**22. Suppose you are using an HTML browser at a client machine C to access a static HTML webpage hosted in a HTTP server S. The page contains exactly one static embedded image which also resides at S. Assuming no web caching which of the following is correct when you load the webpage along with the embedded image?**

- a) C need to send at least 2 HTTP requests to S using two different TCP connection.  
 b) C need to send at least 2 HTTP requests to S but a single TCP connection is sufficient.  
 c) A single HTTP request is sufficient without using any TCP connection from C to S.  
 d) A single HTTP request is sufficient using a single TCP connection from C to S.      **Ans: b**

**Question Bank**

**Note:** Whenever a browser opens a webpage, it makes a separate request for each object of page like image, css, javascript etc. However, if multiple resources are served from same server, then one TCP connect is sufficient.

**23. Which of the followings is the Protocol Data Unit (PDU) for the application layer in the Internet stack?**

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

Ans: c

**Note:** The Protocol Data Unit is the unit of communication at a particular layer.

- The Layer 1 (Physical Layer) PDU is the bit or, more generally, symbol
- The Layer 2 (Data Link Layer) PDU is the frame.
- The Layer 3 (Network Layer) PDU is the packet.
- The Layer 4 (Transport Layer) PDU is the segment for TCP or the datagram for UDP.
- The Layer 5 (Application Layer) PDU is the data or message.

**24. Software goes through a phase in which errors are verified and studied on simulated user environments. This is referred as-**

- a) Alpha testing      b) Beta testing  
c) Gamma testing      d) Delta testing

Ans: b

**Note:** Beta Testing is performed by "real users" of the software application in "real environment" and it can be considered as a form of external User Acceptance Testing. It is the final test before shipping a product to the customers. Direct feedback from customers is a major advantage of Beta Testing. This testing helps to test products in customer's environment.

**25. Suppose you are searching student data using student number as the key. Which of following arrangement of the student data is suited for binary search?**

- a) Student data are arranged in the positions indicated by the student numbers hash values  
b) Student data are arranged randomly irrespective of the student numbers  
c) Student data are arranged in ascending order of student numbers  
d) Student data are arranged in the order of the cell addresses of the student numbers locations.

Ans: c

**26. Suppose you have an 8-bit binary number N. Which of the following operations does not change its lower 4 bits?**

- a) An exclusive logical sum of N with OFh    b) A logical sum of N with OFh  
c) A negative logical product of N with OFh    d) A logical product of N with OFh

Ans: c

**27. Suppose you need to assign IPv4 address to two computers of your company so that the both computers belong to the subnet 255.255.255.240. Which of the following is a valid assignment?**

- a) 172.16.5.14 and 172.16.5.17      b) 172.16.5.17 and 172.16.5.29  
c) 172.16.5.29 and 172.16.5.33      d) 172.16.5.33 and 172.16.5.4

Ans: a

## Question Bank

MCQ

28. A relationship is given below in an ER diagram. How many tables can be created (preferred) from below diagram?



- a) One    b) Two    c) Three    d) No definite numbers

Ans: c

29. Which of the following statements about connecting device between LANs is accurate?

- a) Gateway converts the protocols of the first to third layers of the OSI basic reference model  
b) Bridge relays frames based on IP address  
c) Repeater extends transmission distance by amplifying the signal between segments of the same type  
d) Router relays frames based on MAC address

Ans: a

30. Which one of the following regular expressions represents the set of all binary strings with an odd number of 1's?

- a)  $((0+1)^*1(0+1)^*1)^*10^*$     b)  $(0^*10^*10^*)^*0^*1$   
c)  $1^*+(1^*01^*0)^*1^*$     d) None

Ans: d

31. Suppose you want to insert n elements into an empty linked list while maintaining the shorted order. What is the worst-case time complexity?

- a)  $\theta(n)$     b)  $\theta(n \log n)$     c)  $\theta(1)$     d)  $\theta(n^2)$

Ans: d

Note: This question is ambiguous: "needs to be maintained in sorted order", there are two possible cases:

- Needs to be maintained in sorted order on each step (after each insertion). When we are inserting an element in to empty linked list and to perform sorted order list of every element will take  $O(n^2)$ . Each Insertion into a sorted linked list will take  $\theta(n)$  and hence the total cost for n operations is  $\theta(n^2)$ .
- Needs to be maintained in sorted order on final step (only after all insertion). When we are inserting all elements into an empty linked list and to perform a sorted list (using merge sort) after inserting all elements will take  $O(n \log n)$  time.

32. What is the correct output of the following C program statements?

```
int array[]={6, 7, 8, 9, 0, 1, 2, 4, 5, 6}, *p=array+5;
printf("%d\n", p[1]);
```

- a) 1    b) 2    c) 3    d) Compile Error

Ans: b

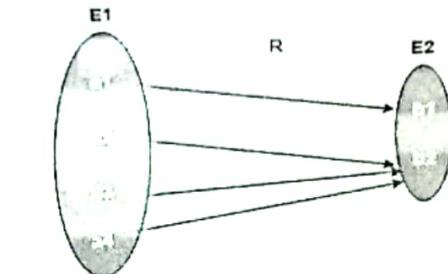
33. Consider an Entity-relationship (ER) model where R is defined as a many-to-one relationship from entity set E1 to entity set E2. If E1 and E2 participate totally in R and cardinality of E1 is greater than the cardinality of E2, which of the following is true about R?

## Question Bank

- a) Every entity in E1 is associated with exactly one entity in E2
- b) Some entity in E1 is associated with more than one entity in E2
- c) Every entity in E2 is associated with exactly one entity in E1
- d) Every entity in E2 is associated with at most one entity on E1

Ans: a

**Note:** Since given relation is many to one:



Therefore, no entity in E1 can be related to more than one entity in E2 and an entity in E2 can be related to more than one entity in E1.

34. After a transaction completes successfully, the changes it has made to the database persist, even if there are system failures. This property of transaction is known as-
- a) Atomicity
  - b) Consistency
  - c) Isolation
  - d) Durability

**Note:**

- **Atomicity:** A transaction is a single unit of operation. Either execute it entirely or do not execute it at all. There cannot be partial execution.
- **Consistency:** Once the transaction is executed, it should move from one consistent state to another.
- **Isolation:** Transaction should be executed in isolation from other transactions (no Locks). During concurrent transaction execution, intermediate transaction results from simultaneously executed transactions should not be made available to each other.
- **Durability:** After successful completion of a transaction, the changes in the database should persist. Even in the case of system failures.

35. Consider the following Employee Table and the SQL query given:

<u><u>id</u></u>	<u><u>Date</u></u>	<u><u>Work_hour</u></u>
1	2020-10-18	8
1	2020-10-17	8
1	2020-10-16	9
2	2020-10-18	7
2	2020-10-16	8
3	2020-10-16	6

SELECT id, sum(work\_hour) from Employee Where Work hour > 6  
Group BY ID;

How many rows are returned by the SQL query?

- a) 3      b) 4      c) 2      d) 0

Ans: c

36. \_\_\_\_\_ is an assault on a service from a single source that floods it with so many requests that it becomes overwhelmed and is either stopped completely or operates at a significantly reduced rate.

- a) Denial-of-service(DoS) attack  
c) Cross-site scripting (XSS) attack

- b) Spoofing attack  
d) Buffer overflow attack

Ans: a

37. Following table shows the delivery record of an online shop. Which of the SQL statements results in the largest value?

Product Id	Date	Quantity
F101	2020-10-17	3
H201	2020-10-17	2
F101	2020-10-16	1
H201	2020-10-16	2

a) SELECT AVE(Quantity) FROM Delivery Record WHERE Product id='F101'

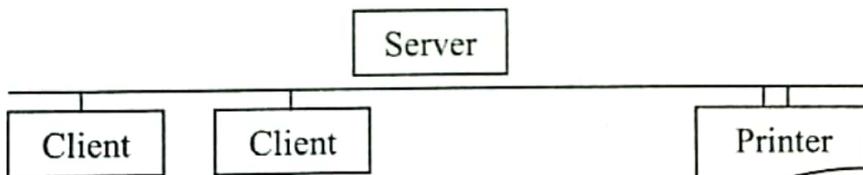
b) SELECT COUNT (\*) FROM Delivery Record

c) SELECT SUM (Quantity) FROM Delivery Record WHERE Date = '2020-10-16'

d) SELECT MAX (Quantity) FROM Delivery Record

Ans: d

38. A system connects a server, two clients and a printer via LAN as shown in the figure below. This system provides access to the data stored in the server from the printer based on the commands issued by a client. If the availability of the server, each of the client and the printer is a, b and c, respectively, what is the availability of the entire system? Note that only one of the two clients need to be in operation and the availability of the LAN is 1.



a) abc      b) ab<sup>2</sup>c      c) a(1-b)<sup>2</sup>c      d) a(1-(1-b)<sup>2</sup>) c

Ans: d

39. What is the output power in watts of the following three-stage system?

$$P_{in} = -12 \text{ db} \rightarrow [40 \text{ db}] \rightarrow [-35 \text{ db}] \rightarrow [25 \text{ db}] \rightarrow P_{out}$$

- a) 0.431 Watt      b) 0.5 Watt      c) 18 Watt      d) 0.0631 Watt

Ans: d

Note: Here,  $P=40-35+25=30$ ,  $P_{in} = -12 \text{ dbm}$

$$P_{out}=P+P_{in}=30-12=18 \text{ dbm}$$

$$P_{out}(W)=(10^{(18/10)} \times 10^{-3}) W=0.631W$$

**Question Bank**

40. Suppose, the operating clock frequency of a typical CPU is 700 MHz and the number of clocks required for execution of three different instruction types are 4, 8, and 10. If the corresponding appearance rate of the instructions are 30%, 60% and 10%, respectively, how many MIPS does this CPU perform?  
 a) 10      b) 50      c) 70      d) 100

Ans: d

**BPSC**  
**Assistant Programmer (Dept. of ICT)**  
**Exam: 2020**

1. ‘b’ এর ASCII value কত?  
 A) 66      B) 98      C) 3000      D) 1      Ans: B
2. Max-Heap data structure এর সবচেয়ে বড় নম্বরটি কোথায় থাকে?  
 A) Leaf      B) Internal node      C) Root      D) Outside      Ans: C
3. নিচের কোনটি E-mail protocol?  
 A) SMTP      B) USB      C) IOT      D) OTB      Ans: A
4. Object Oriented programming এর বৈশিষ্ট্য কোনটি?  
 A) Polymorphism      B) Friend function  
 C) Structure      D) Loop      Ans: A
5. Main Memory কোনটি?  
 A) RAM      B) ROM      C) HDD      D) Floppy      Ans: A

**Note:** The main memory acts as the central storage unit in a computer system. It is a relatively large and fast memory which is used to store programs and data during the run time operations. The primary technology used for the main memory is based on semiconductor integrated circuits. The integrated circuits for the main memory are classified into two major units.

- RAM (Random Access Memory) integrated circuit chips
- ROM (Read Only Memory) integrated circuit chips

6. Sequence Control Register আর কি নামে পরিচিত?  
 A) Program Counter      B) Instruction Counter  
 C) Sequence Register      D) Controlling Register      Ans: A
7. একটি IPv6 address এর দৈর্ঘ্য কত?  
 A) 32 bits      B) 128 bits      C) 64 bits      D) 256 bits      Ans: B
8. C programming এ নিচের কোনটি Invalid variable name?  
 A) Average      B) No#of-students      C) Xyz      D) y23z      Ans: B
9. ACL (Access Control List) এর দুটি প্রধান ধরন হল?  
 A) Standard and Extended      B) Standard and Specialized  
 C) Extended and Specialized      D) Standard and IEEE      Ans: A

10. Intel 8086 microprocessor এর বাহ্যিক Address bus এর width কত bit হয়?  
 A) 8-bit    B) 16-bit    C) 20-bit    D) 32-bit      Ans: C
11. উল্লেখিত কোনটি Database aggregate এর function?  
 A) where    B) sum    C) select    D) from      Ans: B
12. নিচের কোনটি সবচেয়ে দ্রুত Data transfer করতে পারে?  
 A) RAM    B) Hard disk    C) CD ROM    D) Cache Memory      Ans: D
13. FTP protocol নিচের কোনটি ব্যবহার করে?  
 A) IP    B) TCP    C) UDP    D) SMTP      Ans: B
14. C কী ধরনের programming language?  
 A) Low level language    B) Mid-level language  
 C) High level language    D) None of these      Ans: C
15. E-mail service এর সাথে সম্পৃক্ত কোনটি?  
 A) Telnet    B) SSH    C) DHCP    D) SMTP      Ans: D
16. কোন Testing দিয়ে Input-Output ঠিক আছে কিনা বুঝা যায়?  
 A) Black-box Testing    B) Integration Testing  
 C) White-box testing    D) Load Testing      Ans: A
17. BIOS কী  
 A) Hardware    B) Firmware  
 C) Software    D) Combination of hardware and software      Ans: B
18. কম্পিউটারকে নিম্নলিখিতভাবে Internet এর সাথে সংযুক্ত করা যায়?  
 A) Phase-line modem    B) DSL    C) Cable modem    D) All of these      Ans: D
19. Complete Binary tree যার height n, তার মধ্যে node কতটি?  
 A) n    B)  $2^n$     C)  $2^{n-1}$     D)  $2^{n+1}-1$       Ans: D
20. Array data structure এ কোন ধরনের data রাখা যায়?  
 A) various type data    B) Only pointer type data  
 C) Classes data    D) Same type many data      Ans: D
21. কোনটি প্রথম Network?  
 A) CNNET    B) NSFNET    C) ASPANET    D) ARPANET      Ans: D
22. নিচের কোনটি C ভাষার Keyword নয়?  
 A) struct    B) int    C) star    D) float      Ans: C
23. নিচের কোনটি Antivirus নয়?  
 A) Norton    B) McAfee    C) Dr. Solomon toolkit    D) Security Point      Ans: D
- Note: Dr Solomon's Antivirus was a top rated commercial virus scanning suite. There were versions for DOS, Windows 3.1, 95, 98, Novell, SCO Unix, Solaris and OS/2. In 1998 the company was acquired by McAfee.
24. কোন Routing Protocol এ Dijkstra Algorithm ব্যবহার করা হয়?  
 A) ARP    B) OSPF    C) RIP    D) IGRP      Ans: B
25. Microprocessor এর কোন অংশে ALU থাকে?  
 A) Fetch unit    B) Control Unit    C) Processing Unit    D) Flags Unit      Ans: C

## Question Bank

**Note:** First, we use the Shannon formula to find our upper limit

$$C = B \log_2(1+SNR) = 10^6 \log_2(1+63) = 10^6 \log_2(64) = 6 \text{Mbps}$$

**8. A filter having a single continuous transmission band with neither the upper nor the lower cutoff frequencies is zero or infinite is called-**

- (a) Band pass filter
- (b) Low pass filter
- (c) High pass filter
- (d) Band stop filter

Ans: a

**Note:** A band-pass filter or band pass filter is a device that passes frequencies within a certain range and rejects frequencies outside that range.

**9. The concept of which Superposition theorem is based on-**

- (a) Reciprocity
- (b) duality
- (c) non-linearity
- (d) linearity

Ans: d

**Note:** Superposition theorem is based on the concept of linearity between the response and excitation of an electrical circuit. It states that the response in a particular branch of a linear circuit when multiple independent sources are acting at the same time is equivalent to the sum of the responses due to each independent source acting at a time.

**10. Bridge is a \_\_\_\_\_ device.**

- (a) Layer-2
- (b) Layer-3
- (c) Layer-1
- (d) Layer-2 and Layer-3

Ans: a

**Note:** A network bridge is a computer networking device that creates a single aggregate network from multiple communication networks or network segments. This function is called network bridging. In the OSI model, bridging is performed in the data link layer (layer 2).

**11. Some program exists for computers use to help it manage it task and devices, which are called-**

- (a) Software
- (b) Application software
- (c) System software
- (d) Firmware

Ans: c

**Note:** An operating system is a software program that empowers the computer hardware to communicate and operate with the computer software. An operating system is one of the most important parts of a computer. The operating system is able to do basic tasks as well as complex tasks.

**12. At absolute zero temperature, a semiconductor behaves as a/an-**

- (a) Good conductor
- (b) Superconductor
- (c) Insulator
- (d) Variable resistor

Ans: c

**Note:** At or close to absolute zero a semiconductor behaves like an insulator. When an electron gains enough energy to participate in conduction (is "free"), it is at a high energy state.

**13. If two generators are running in parallel and field of one of the generators is weakened too much then it will-**

- (a) Take the smaller shunt of the total load
- (b) Run as the motor in the same direction
- (c) Take a large share of the total load
- (d) Run in the opposite direction as motor

Ans: b

**Note:** Because of their slightly drooping voltage characteristics, shunt generators are most suited for stable parallel operation. It is obvious that if the field of one generator is weakened

**Question Bank**

too much, then power will be delivered to it and it will run in its original direction as a motor, thus driving its prime-mover.

**14. The fact that the conductor carries more current on the surface of core is known as-**

- (a) Permeability    (b) Surface tension    (c) Corona    (d) skin effect    **Ans: d**

**Note:** Skin effect is the tendency of an alternating electric current (AC) to become distributed within a conductor such that the current density is largest near the surface of the conductor and decreases exponentially with greater depths in the conductor. The electric current flows mainly at the "skin" of the conductor, between the outer surface and a level called the skin depth.

**15. The technique that is used to digitize analog signal by a codec is called-**

- (a) PCM    (b) Demodulation    (c) CDMA    (d) NRZ    **Ans: a**

**Note:** Pulse-code modulation (PCM) is a method used to digitally represent sampled analog signals. This is in contrast to PCM encodings in which quantization levels vary as a function of amplitude (as with the A-law algorithm or the  $\mu$ -law algorithm).

**16. A load is connected to a network. At the terminal to which the load is connected,  $R_{th}=10$  and  $V_{th}=40V$ . The maximum possible power supplied to the load is-**

- (a) 160 W    (b) 80 W    (c) 40 W    (d) 1 W    **Ans: c**

**Note:** Maximum power transferred is given by  $V_{TH}^2/4R_{TH}$ . So,  $1600/40 = 40W$

**17. Baidu is one kind of -**

- (a) Search Engine    (b) Book store    (c) Payment    (d) Operating    **Ans: a**

**Note:** Baidu is one of the most popular search engines and one of the largest internet companies in the world. Baidu has origins in RankDex, an earlier search engine developed by Robin Li in 1996, before he founded Baidu in 2000.

**18. When you pass array as an argument to a function, which actually gets passed?**

- (a) Base address of the array  
 (b) The first element of the array  
 (c) Address of the first element of the array  
 (d) Address of the last element of the array    **Ans: a**

**Note:** In C language when we pass an array as a function argument, then the Base address of the array will be passed.

**19.  $(B12)_{16} + (5CA)_{16} = ?$**

- (a)  $(10DC)_{16}$     (b)  $(AFDC)_{16}$     (c)  $(1FDC)_{16}$     (d)  $(E1DC)_{16}$     **Ans: a**

**Note:**

$$\begin{array}{r} \text{B12} \\ \text{---} \\ 1101 \ 0001 \ 0010 \\ + \quad 0101 \ 1100 \ 1010 \\ \hline \end{array} = 0001 \ 0000 \ 1101 \ 1100$$

(1      0      D      C)<sub>16</sub>

**20. Which class of IP address provides a maximum of only 254 host address per network ID?**

- (a) Class A    (b) Class B    (c) Class C    (d) Class D    **Ans: c**

**Note:** A Class C network address has only 8 bits for defining hosts:  $2^8 - 2 = 254$ .

**Question Bank****21. A constructor is a special type of-**

- (a) Class    (b) Field    (c) Method    (d) Property

Ans: c

**Note:** Constructor is a Special type of function/method used to create an object. In class-based object-oriented programming, a constructor (abbreviation: ctor) is a special type of subroutine called to create an object. It prepares the new object for use, often accepting arguments that the constructor uses to set required member variables. Immutable objects must be initialized in a constructor.

**22. What is the following declaration for? `int (*a) [10];`**

- (a) Pointer to an array of 10 integers    (b) Array of 10 function Pointers returning integer  
 (c) A pointer of to function returning an array to 10 integers  
 (d) Array of 10 integers pointers

Ans: a

**23. How long is an IPv6 address?**

- (a) 32-bits    (b) 128-byts    (c) 64-bits    (d) 128-bits

Ans: d

**Note:** An IPv6 address is 128 bits in length and consists of eight, 16-bit fields, with each field bounded by a colon. Each field must contain a hexadecimal number, in contrast to the dotted-decimal notation of IPv4 addresses.

**24. Which one of the following is the source of data communication?**

- (a) Modem    (b) Cable    (c) Router    (d) Computer

Ans: d

**Note:** The meanings of source and receiver are very simple. The device that transmits the data is known as source and the device that receives the transmitted data is known as receiver. Data communication aims at the transfer of data and maintenance of the data during the process but not the actual generation of the information at the source and receiver.

**25. Cloud computing is a \_\_\_\_\_ system and it is necessarily unidirectional in nature.**

- (a) Stateless    (b) Stateful    (c) Reliable    (d) Windows

Ans: a

**Note:** Cloud computing is a stateless system, as is the Internet in general.

**26. If the frequency spectrum of a signal has a bandwidth of 500Hz with the highest frequency is 600Hz. What should be the sampling rate according to the Nyquist theorem?**

- (a) 200 samples/S    (b) 500 samples/S  
 (c) 1000 samples/S    (d) 1200 samples/S

Ans: d

**Note:** The Nyquist–Shannon sampling theorem is a theorem in the field of digital signal processing which serves as a fundamental bridge between continuous-time signals and discrete-time signals.

**27. A common representation of process scheduling is -**

- (a) Static diagram    (b) Scheduling queues  
 (c) Queuing diagram    (d) Process control block

Ans: c

**Note:** A common representation of process scheduling is the queuing diagram. The rectangular box represents the queue. The circle represents the resource. New process always is put in ready queue.

**28. The sole purpose of a commentator in a DC generator is to-**

- (a) Increase output voltage
- (b) Reduce sparking at brushes
- (c) Provides smoother output
- (d) Convert the induced AC to DC

**Ans: d**

**Note:** In a generator the commutator picks off the current generated in the windings, reversing the direction of the current with each half turn, serving as a mechanical rectifier to convert the alternating current from the windings to unidirectional direct current in the external load circuit.

**29. What is default level of inheritance has to be specified in C++?**

- (a) Public
- (b) Private
- (c) Protected
- (d) Compile time error

**Ans: b**

**Note:** Access specifier can be public, protected and private. The default access specifier is private. Access specifiers affect accessibility of data members of base class from the derived class. In addition, it determines the accessibility of data members of base class outside the derived class. The basic syntax of inheritance is:

```
class DerivedClass : accessSpecifier BaseClass
```

**30. MIRC Means-**

- (a) Magnetic Ink Character Reader
- (b) Magnetic Ink Code Reader
- (c) Magnetic Ink Case Reader
- (d) None

**Ans: d**

**Note:** MIRC stands for Microsoft Internet Relay Chat. MIRC is a particular kind of Internet Relay Chat messaging service. It is compatible with the Windows operating system architecture used by many different kinds of end-users.

**31. Which of the following cloud concept is related to pooling and sharing of resources?**

- (a) Polymorphism
- (b) Abstraction
- (c) Virtualization
- (d) Digitizing

**Ans: c**

**Note:** Virtualization is related to pooling and sharing in a cloud concept. Through this, the resources are shared. Through this type of computation, it is possible to run applications and services on a common distributed network. Abstraction is one of the critical concepts of cloud computing.

**32. Which one of the following is a private network based on public network?**

- (a) Local Area Network
- (b) Virtual Private Network
- (c) Storage Area Network
- (d) Enterprise Private Network

**Ans: b**

**Note:** A virtual private network extends a private network across a public network and enables users to send and receive data across shared or public networks as if their computing devices were directly connected to the private network.

**33. The scheduling queue is generally stored as-**

- (a) A liner array
- (b) A stack
- (c) A linked list
- (d) A tree

**Ans: c**

**Note:** A linked list is a linear data structure where each element is a separate object. Each element of a list is comprising of two items - the data and a reference to the next node. The last node has a reference to null. The entry point into a linked list is called the head of the list.

**34. In the hypermedia database, information bits are stored in the form of:**

- (a) Cubes
- (b) Nodes
- (c) Signals
- (d) Symbols

**Ans: b**

**Question Bank**

**Note:** Hypermedia database model stores chunks of information in the form of nodes connected by links established by the user. The nodes can contain text, graphics, sound, full-motion video, or executable computer programs.

**35. Who preside the interface between a process and the OS?**

- (a) Kernel
- (b) System calls
- (c) Command
- (d) Graphical user

Ans: b

**Note:** The interface between a process and an operating system is provided by system calls. In general, system calls are available as assembly language instructions. They are also included in the manuals used by the assembly level programmers.

**36. To execute a program, an OS creates a number of \_\_\_\_\_, each one for, running a different program.**

- (a) Processors
- (b) Threads
- (c) Virtual processors
- (d) Kernel

Ans: b

**Note:** A thread of execution is the smallest sequence of programmed instructions that can be managed independently by a scheduler, which is typically a part of the operating system.

**37. The process of laying out a document with text, graphics, headlines and photographs is involved in:**

- (a) Deck Top Printing
- (b) Desk Top Printing
- (c) Desk Top Publishing
- (d) Deck Top Publishing

Ans: c

**Note:** Desktop publishing (DTP) is the creation of documents using page layout software on a personal ("desktop") computer. It was first used almost exclusively for print publications, but now it also assists in the creation of various forms of online content.

**38. The request and release of resources are-**

- (a) Command line
- (b) Interrupts statements
- (c) System calls
- (d) Special program

Ans: c

**Note:** A system call is the programmatic way in which a computer program requests a service from the kernel of the operating system on which it is executed.

**39. What is the largest decimal value that can be represented by 12 bits?**

- (a) 1024
- (b) 2048
- (c) 2095
- (d) 4095

Ans: d

**Note:** The largest 12-bit binary number is one less than the lowest 13-bit binary number, hence:

$$111111111111(\text{binary}) = 100000000000(\text{binary}) - 1 = 2^{12}(\text{decimal}) - 1 = 4095$$

**40. Information, a combination of graphics, text, sound, video and animation is called-**

- (a) Multitask
- (b) Multimedia
- (c) Multiprocessor
- (d) Multiprogramming me

Ans: b

**Note:** Multimedia is any combination of text, sound, animation and video delivered by computer or other electronic or digitally manipulated means. It is a woven combination of digitally manipulated text, photographs, graphic art, sound, animation and video elements.