

SEAL

IMPORTANT INSTRUCTIONS

Candidates should read the below instructions carefully and follow them accordingly.

1. The Question Booklet has paper seal pasted on it. Please do **NOT** open the Question Booklet until you are asked to do so by the Invigilator.
2. The Candidates must check immediately after breaking the seal that the Question Booklet contains **100 Multiple Choice Questions** in two parts (Part—I and Part—II).
3. Answer of questions of Part—I and Part—II both will have to be given on the **OMR Answer Sheet** provided for this purpose. Fill up the necessary fields that are intended for you by writing and/or shading appropriately. Otherwise the **OMR Answer Sheet cannot** be evaluated and will liable to be rejected. Question numbers progress from **1** to **100** continuously with alternative answers being shown as [A], [B], [C] and [D] for each question. Record your response by completely darkening the corresponding bubble. While responding, you should consider the best alternative answer and shade only one bubble with **black/blue ball point pen only**. For each correct response you will be awarded **1** mark. There will be negative marking for wrong responses. For each wrong response, **-0.25** mark will be awarded. Multiple responses against one MCQ will be treated as a wrong response.
4. On leaving the examination hall, candidates must submit the OMR Answer Sheet. They are allowed to keep the Question Booklet with them.
5. **OMR Answer Sheet** will be processed by electronic means. Any untoward/irrelevant remarks, folding or putting stray notes on the answer sheet, any damage to the answer sheet will lead to the rejection of the same and the sole liability shall remain with the candidate.
6. Rough Work may be done at the end of the Question Booklet.
7. No Candidate will be allowed to leave the examination hall before 60 minutes of the commencement of examination. Candidates leaving the examination hall before conclusions of the examination will not be allowed to take the Question Booklet with them while going outside the examination hall.
8. Use of any Electronic device like Mobile, Programmable Calculator etc. is strictly prohibited.

(PART—I : Core Subject)

1. Let $S = \{a, b, c, d, e\}$. The number of strings in S^* of length 4 such that no symbol is used more than once in a string

[A] 360

[B] 120

[C] 35

[D] 36

2. Recursively enumerable languages are not closed under

[A] union

[B] homomorphism

[C] complementation

[D] concatenation

3. The main idea behind computer files is that it is convenient to

[A] arrange them

[B] store information together

[C] create them

[D] access them

4. A command to remove a relation from an SQL database is

[A] Delete table <table name>

[B] Drop table <table name>

[C] Erase table <table name>

[D] Alter table <table name>

5. The online, softcopy display customer's charge account to respond to an inquiry is an example of a/an

[A] forecasting report

[B] exception report

[C] regularly scheduled report

[D] on-demand report

6. Number of exchanges required for the sequence 100, 91, 82, 76, 45, 32, 201, 325 to sort in ascending order using bubble sort algorithm is

[A] 8

[B] 64

[C] 10

[D] 21

7. If events A and B are independent events with $P(A) = 0.2$ and $P(B) = 0.6$, then $P(A \cup B) = ?$

[A] 0.8

[B] 0.68

[C] 0.12

[D] 0.60

8. The probability of an intersection of two events is computed by using the

[A] law of addition

[B] law of subtraction

[C] law of multiplication

[D] law of division

- 9.** If $P(A|B) = 0.35$, then
[A] $P(B|A) = 0.65$
[B] $P(A^c|B) = 0.65$
[C] $P(A|B^c) = 0.65$
[D] $P(A^c|B^c) = 0.65$
- 10.** If $P(A) = 0.5$ and $P(B) = 0.5$, then $P(A \cap B)$ is
[A] 0
[B] 0.25
[C] 0.1
[D] Cannot be determined from the given information
- 11.** Events A and B are mutually exclusive. Which of the following statements is true?
[A] $P(A \cup B) = P(A)P(B)$
[B] A and B are independent
[C] $P(A \cup B) = P(A) + P(B)$
[D] $P(A \cap B) = P(A) + P(B)$
- 12.** 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] None of the above
- 13.** In SQL, which command is used to make permanent changes made by statements issued since the beginning of a transaction?
[A] ZIP
[B] PACK
[C] COMMIT
[D] SAVE
- 14.** The database administration function includes
[A] application programming
[B] computer operations management
[C] database access planning
[D] All of the above
- 15.** Identify the data structure which allows deletion at both ends of the list but insertion at only one end.
[A] Output restricted stack
[B] Input restricted dequeue
[C] Output restricted dequeue
[D] Input restricted stack
- 16.** In the _____ traversal, we process all of vertex's descendants before we move to an adjacent vertex.
[A] depth limited
[B] DFS
[C] BFS
[D] width first

17. Data integrity control

- [A] is used to set upper and lower limits on numeric data
[B] requires the use of passwords to prohibit unauthorized access to the file
[C] has the data dictionary kept the date and time of last access last back-up, and most recent modification for all files
[D] None of the above

18. The files stored on a secondary stage device are composed of a hierarchy of data. What does a record in a file contain?

- [A] Bits
[B] Characters
[C] Data field
[D] Schema

19. What is the name given to the database management system which is able to handle full text data, image data, audio and video?

- [A] Full media
[B] Graphic media
[C] Multimedia
[D] Hypertext

20. In mathematical term, table is referred as

- [A] relation
[B] attribute
[C] tuple
[D] domain

21. What is the name of the technique in which the operating system of a computer executes several programs concurrently by switching back and forth between them?

- [A] Partitioning
[B] Multitasking
[C] Windowing
[D] Paging

22. A development strategy whereby the executive control modules of a system are coded and tested first, is known as

- [A] bottom-up development
[B] top-down development
[C] left-right development
[D] All of the above

23. Which of the following terms refers to the degree to which data in a database system is accurate and **correct**?

- [A] Data security
[B] Data validity
[C] Data independence
[D] Data integrity

24. If the number of bits in a virtual address of a program is 16 and the page size is 0.5 K bytes, the number of pages in the virtual address space is

- [A] 16
[B] 32
[C] 64
[D] 128

25. The process of transferring data intended for a peripheral device into a disk (or intermediate store) so that it can be transferred to peripheral at a more convenient time or in bulk, is known as

- [A] multi-programming
- [B] spooling
- [C] caching
- [D] virtual programming

26. The action of parsing the source program into the proper syntactic classes is known as

- [A] syntax analysis
- [B] lexical analysis
- [C] interpretation analysis
- [D] general syntax analysis

27. Non-modifiable procedures are called

- [A] serially usable procedures
- [B] concurrent procedures
- [C] re-entrant procedures
- [D] top-down procedures

28. In which of the following storage placement strategies, a program is placed in the smallest available hole in the main memory?

- [A] Best fit
- [B] First fit
- [C] Worst fit
- [D] Buddy

29. In which addressing mode, the effective address of the operand is generated by adding a constant value to the contents of register?

- [A] Absolute mode
- [B] Indirect mode
- [C] Immediate mode
- [D] Index mode

30. The CPU after receiving an interrupt from an I/O device

- [A] halts for a predetermined time
- [B] hands over control of address bus and data bus to the interrupting device
- [C] branches off to the interrupt service routine immediately
- [D] branches off to the interrupt service routine after completion of the current instruction

31. A task in a blocked state

- [A] is executable
- [B] is running
- [C] must still be placed in the run queues
- [D] is waiting for some temporarily unavailable resources

32. Which of the following statements is *false*?

- [A] A process scheduling algorithm is pre-emptive if the CPU can be forcibly removed from a process
- [B] Time sharing systems generally use preemptive CPU scheduling
- [C] Response time is more predictable in preemptive systems than in non-preemptive systems
- [D] Real time systems generally use non-preemptive CPU scheduling

33. Which problem is solved by Dijkstra's banker algorithm?

[A] Mutual exclusion

[B] Deadlock recovery

[C] Deadlock avoidance

[D] Cache coherence

34. The principles of structured programming forbid the use of

[A] WHILE-DO

[B] GOTO

[C] IF - THEN - ELSE

[D] DO - WHILE

35. When you boot a PC and don't hear any beep, this could suggest which of the following?

[A] The monitor is turned off

[B] Keyboard not plugged in

[C] Normal PC boot

[D] Bad or disconnected speaker

36. In Reverse Polish notation, expression A^*B+C*D is written as

[A] AB^*CD^*+

[B] A^*BCD^*+

[C] AB^*CD+*

[D] A^*B^*CD+



37. In a vectored interrupt,

[A] the branch address is assigned to a fixed location in memory

[B] the interrupting source supplies the branch information to the processor through an interrupt vector

[C] the branch address is obtained from a register in the processor

[D] None of the above

38. A device that links two homogeneous packet-broadcast local networks, is called

[A] hub

[B] bridge

[C] repeater

[D] gateway

39. In OSI model, which of the following layer provides error-free delivery of data?

[A] Data link layer

[B] Network layer

[C] Session Layer

[D] Transport layer

40. The signal to noise ratio for a voice grade line is 30.1 dB (decibels) or a power ratio of 1023:1. The maximum achievable data rate on this line whose spectrum ranges from 300 Hz to 4300 Hz is

[A] 6200 bps

[B] 9600 bps

[C] 34000 bps

[D] 31000 bps

- 41.** You have a network ID of 192.168.10.0 and require at least 25 host IDs for each subnet, with the largest amount of subnets available. Which subnet mask should you assign?
- [A] 255.255.255.192
[B] 255.255.255.224
[C] 255.255.255.240
[D] 255.255.255.248
- 42.** How many pairs of stations can simultaneously communicate on Ethernet LAN?
- [A] 3
[B] 1
[C] 2
[D] Multiple
- 43.** When a host knows its physical address but not its IP address, it can use
- [A] RARP
[B] ARP
[C] ICMP
[D] IGMP
- 44.** An error detecting code is which code is the remainder resulting from dividing the bits to be checked by a predetermined binary number, is known as
- [A] cyclic redundancy check
[B] checksum
[C] error detecting code
[D] error rate
- 45.** After you have verified that TCP/IP is installed correctly, what is the next step in verifying the TCP/IP configuration?
- [A] Ping the broadcast address
[B] Ping the Microsoft Website
[C] Ping a distant router
[D] Ping the address of the local host
- 46.** In C++, inline function is a/an
- [A] order that must be followed
[B] request that may be followed or may not be followed
[C] not available
[D] can't say
- 47.** Number of complements is
- [A] 2
[B] 8
[C] 4
[D] infinite
- 48.** Data stored in computer memory that follows 32 bits signed 2's complement method is $(FFFFFE7)_{16}$. The decimal equivalent value of the following number is
- [A] 39
[B] -25
[C] 4, 29, 49, 67, 271
[D] -2, 14, 74, 83, 672

49. In C programming, for float $a = 3.14$ and size of (a) is 4 bytes, then size of (3.14) will be
- [A] 4 bytes
 - [B] 2 bytes
 - [C] 8 bytes
 - [D] Error
50. The "while loop" in the following C codes will be
- ```
int c=1;
while(c++)
{
 printf("Hello");
}
```
- [A] erroneous
  - [B] correct and finite
  - [C] correct and infinite
  - [D] None of the above
51. SMPS stands for
- [A] Switched Mode Power Supply
  - [B] Start Mode Power Supply
  - [C] Single Mode Power Supply
  - [D] Store Mode Power Supply
52. The default value of global variable in C programming is
- [A] -1
  - [B] +1
  - [C] garbage
  - [D] 0
53. If int  $i=1$ , then while ( $i++$ ) will (assuming it requires 16 bits in computer memory)
- [A] be a finite loop
  - [B] be an infinite loop
  - [C] give syntax error
  - [D] stop the execution
54. Structure tag in the definition of a structure in C
- [A] must be in all case
  - [B] may be omitted
  - [C] is not required if the structure is not used
  - [D] None of the above
55. Number of tree traversal algorithm for any binary tree is only tree as
- [A] it has root, left subtree and right subtree
  - [B] maximum number of children that any node can have is two
  - [C] Both [A] and [B]
  - [D] left subtree should be traversed before right subtree
56. MAC address of computer is \_\_\_\_\_ address and it is \_\_\_\_\_ long.
- [A] logical and 128 bits
  - [B] physical and 48 bits
  - [C] logical and 32 bits
  - [D] physical and 32 bits

57. Which of the following is **not** true for problem solving in AI?

- [A] Implement heuristic search techniques
- [B] Solution steps are not fixed
- [C] It works on or implements repetition techniques
- [D] Knowledge is imprecise

58. Who among the following known as the father of AI?

- [A] Ada Fisher
- [B] Alan Turing
- [C] John McCarthy
- [D] Allen Newell

59. How many types of recognition are there in AI?

- [A] 1
- [B] 2
- [C] 3
- [D] 5

60. Which of the following is used for reinforcement machine learning?

- [A] Fast forest quantile
- [B] Q-learning
- [C] Naïve Bayes
- [D] Principal Component Analysis

61. In signed magnitude number in computer; no. of bits required to indicate sign is 1 and no. of bits required to indicate magnitude is P. So, the number of bits that represent the whole number is

- [A] P+1
- [B] P
- [C] P-1
- [D] either [B] or [C]

62. The number of 1's present in the number:  $14 \times 4096 + 256 \times 11 + 115$  when stored in computer memory (word size 16 bits) is

- [A] 16
- [B] 5
- [C] 10
- [D] 11

63. Which of the following is **not** an internal sort?

- [A] Insertion sort
- [B] Bubble sort
- [C] Merge sort
- [D] Heap sort

64. The bias in IEEE754 single precision is

- [A] 128
- [B] 255
- [C] 127
- [D] -128

65. The addressing mode of instruction STAX B in 8085 is  
[A] memory direct  
[B] register direct  
[C] register indirect  
[D] memory indirect

66. 7's complement of  $(546)_7$  is  
[A] 231  
[B] 120  
[C] 122  
[D] 121

67. In a sequence of integer, initial few elements are sorted followed by few random numbers. Which of the following sorting technique will be the best for this sequence?  
[A] Quick sort  
[B] Heap sort  
[C] Bubble sort  
[D] Insertion sort

68. Solve the problem  $(45)_7 + (66)_7$   
[A]  $(111)_7$   
[B]  $(144)_7$   
[C]  $(1110)_7$   
[D]  $(1011)_7$

69. The simplification in minimal SOP of  $Y = F(A, B, C, D) = \Sigma_m(0, 2, 3, 6, 7) + \Sigma_d(8, 10, 11, 15)$  using K-maps is  
[A]  $AC + BD'$   
[B]  $AC' + BD'$   
[C]  $Y = A'C + B'D'$   
[D]  $A'C' + B'D$

70. The delay in digital logic circuit depends on  
[A] basic gate counts  
[B] number of NAND gates  
[C] number of levels  
[D] number of NOR gates

71. The intersection of CFL and regular language  
[A] is always regular  
[B] need not be regular  
[C] is always context free  
[D] Both [A] and [B]

72.  $R_1$  and  $R_2$  are regular sets defined over alphabet, then which of the following is **true**?  
[A]  $R_1 \cap R_2$  is not regular  
[B]  $R_1 \cup R_2$  is not regular  
[C]  $\Sigma^* - R_1$  is regular  
[D]  $R_1^*$  is not regular

73. A language is represented by a regular expression  $(a)^*(a + ba)$ . Which of the following strings **does not** belong to the regular set represented by the above expression?

$a^2 + aba$

[A]  $aba$

$a^3$

[B]  $aaa$

$a^2$

$ababa$

[C]  $aa$

$a^2$

[D]  $a^2$

$a^2$

74. The grammars  $G = (\{S\}, \{0, 1\}, p, S)$  where,  $p = (s \rightarrow 0S1, S \rightarrow 0S, S \rightarrow S1, S \rightarrow 0)$  is a  
[A] recursively enumerable language  
[B] regular language  
[C] context-sensitive language  
[D] context-free language

75. Can a DFSA simulate an NFSA?

- [A] Yes  
[B] No  
[C] Sometimes  
[D] Depends on NFA

76. The concept of grammar is much used in which part of the compiler?

- [A] Lexical analysis  
[B] Parser  
[C] Code generation  
[D] Code optimization

77. The following CFG is in

$S ? AB$   
 $B ? CD$   
 $B ? AD$   
 $B ? b$   
 $D ? AD$   
 $D ? d$   
 $A ? a$   
 $C ? a$

- [A] Chomsky normal form but not strong Chomsky normal form  
[B] weak Chomsky normal form but not Chomsky normal form  
[C] strong Chomsky normal form  
[D] Greibach normal form

78. Which of the following problems is undecidable?

- [A] Membership problem for CFL  
[B] Membership problem for regular sets  
[C] Membership problem for CSL  
[D] Membership problem for type 0 languages

79. A given grammar is called ambiguous if

- [A] two or more productions have the same non-terminal on the left-hand side  
[B] a derivation tree has more than one associated sentence  
[C] there is a sentence with more than one derivation tree corresponding to it  
[D] brackets are not present in the grammar

80. Consider the grammar

$$S \rightarrow PQ \mid SQ \mid PS$$

$$P \rightarrow x$$

$$Q \rightarrow y$$

To get a string of  $n$  terminals, the number of productions to be used is

- [A]  $n^2$   
[B]  $n + 1$   
[C]  $2n$   
[D]  $2n - 1$

**PART-II****( General Knowledge, General English & Islamic History and Culture )**

81. Fill in, with relative pronoun, the blank space below:  
The man, \_\_\_\_ briefcase was lost, reported to the police.

- [A] that
- [B] whose
- [C] which
- [D] whom

82. Select the option that is the indirect form of the given sentence :

Rupa said, "I am very busy now".

- [A] Rupa told that she might be very busy then.
- [B] Rupa said that she is very busy now.
- [C] Rupa said that she was very busy then.
- [D] Rupa said that she will be very busy then.

83. Fill in the blank with the most appropriate option :

\_\_\_\_ you like to drink milk twice daily?

- [A] When
- [B] Does
- [C] Do
- [D] What

84. Fill in the blank with the most appropriate option :

\_\_\_\_ has taken my new red pen?

- [A] Who
- [B] Why
- [C] Where
- [D] What

85. Fill in the blank with the most appropriate option :

\_\_\_\_ she get good marks in the Bengali test?

- [A] Has
- [B] Don't
- [C] Hasn't
- [D] Didn't

86. Hadrat Umer was Caliph for  
[A] 2 years  
[B] 4 years  
[C] 10 years  
[D] None of the above

87. Which country is called the "Land of Prophets"?

- [A] Saudi Arabia
- [B] Syria
- [C] Palestine
- [D] Iraq

88. Hadrat Ali's (R.A.) wife was

- [A] Ruqayyah (R.A.)
- [B] Fatima (R.A.)
- [C] Umm Kulthum (R.A.)
- [D] Hadrat Aisha (R.A.)

89. The Pre-Islamic Era is known as

- [A] Modern Age
- [B] Age of Ignorance
- [C] Golden Age
- [D] None of the above

90. Which prayer is not obligatory for women?

- [A] Maghrib Prayer
- [B] Isha Prayer
- [C] Juma Prayer
- [D] Fajar Prayer

91. The first Masjid that was built by the Holy Prophet (PBUH) was

- [A] Masjid ul Haram
- [B] Masjid ul Aqsa
- [C] Masjid e Quba
- [D] Masjid e Nabavi

92. What does Zam Zam mean?

- [A] Water
- [B] Water well
- [C] Stop
- [D] Drink

93. What is Abu Bakr's (R.A.) full name?

- [A] Abdul Rahman ibn Uthman
- [B] Uthman ibn Abdullah
- [C] Abdullah ibn Abdur Rahman
- [D] Abdullah ibn Uthman

94. In which battle did some Muslim archers disobey the order of Prophet Muhammad (PBUH)?

- [A] Battle of Badr
- [B] Battle of Uhud
- [C] Battle of Khaybar
- [D] Battle of Khandaq

95. Which is **not** one of the five pillars of Islam?

- [A] Roza
- [B] Namaz
- [C] Zakat
- [D] Paradise

96. Big Bang theory explains

- [A] origin of Universe
- [B] origin of Sun
- [C] origin of gravitation
- [D] origin of bacteria

97. Visva-Bharati is situated in the district of

- [A] Purulia
- [B] Bankura
- [C] Birbhum
- [D] Medinipur

98. Dhyan Chand was associated with the sports

- [A] Running
- [B] Football
- [C] Boxing
- [D] Hockey

99. Gatidhara Prakalpa is introduced by the Government of

- [A] West Bengal
- [B] Odisha
- [C] Maharashtra
- [D] Gujarat

100. The founder of the organisation Bengal Chemical was

- [A] Nil Ratan Sarkar
- [B] Prafulla Chandra Roy
- [C] Dwarakanath Tagore
- [D] Alamohan Das

[P.T.O.]