

M.TECH ENTRANCE TEST-2022
SCHOOL OF APPLIED SCIENCE & TECHNOLOGY
Subject (Computer Science)

Total Questions: 60
Time Allowed : 70 Minutes

Roll No.

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Instructions for Candidates

1. Write your roll number in the space provided at the top of this page of question booklet and fill up the necessary information in the spaces provided on OMR Answer sheet.
2. OMR Answer sheet has an original copy and a candidate's copy glued beneath it at the top. While making entries in the original copy, candidate should ensure that the two copies are aligned properly so that the entries made in the original copy against each item are exactly copied in the candidate's copy.
3. All entries in the OMR answers sheet including answers to questions are to be recorded in the original copy only.
4. Use only blue/ black ball point pen to darken the circle of correct / most appropriate response. In no case gel/ ink pen or pencil should be used.
5. Do not darken more than one circle of option for any question. A question with more than one darkened response shall be considered wrong.
6. There will be "Negative Marking" for wrong answers. Each wrong answer will lead to the deduction of 0.25 marks from the total score of the candidate.
7. Only those candidates who would obtain positive score in entrance test examination shall be eligible for admission
8. Do not make any stray mark on the OMR sheet
9. Calculators and mobiles shall not be permitted inside the examination hall
10. Rough work, if any, should be done on the blank sheets provided with the question booklet.
11. OMR answer sheet must be handled carefully and it should not be folded or mutilated in such case it will not be evaluated.
12. Ensure that your OMR Answer sheet has been signed by the invigilator and the candidate himself/herself.
13. At the end of the examination hand over the OMR answer sheet to the invigilator who will first tear off the original OMR sheet in presence of the candidate and hand over the candidate's copy to the candidate.
14. If any of the information in the response sheet/question paper has been found missing or not mentioned as stated above the candidate is solely responsible for that lapse.

SEAL

- 100
1. The opposite of "COMMISSIONED" IS
 - a. Started
 - b. Closed
 - c. Finished
 - d. Terminated

 2. The one word for "That which cannot be corrected" is
 - a. Unintelligible
 - b. Incurable
 - c. Illegible
 - d. Indelible

 3. Even if it rains, I shall come means
 - a. If it rains, I will come
 - b. I will definitely come if it rains
 - c. I will certainly come whether it rains or not
 - d. I shall come only if it rains

 4. "To hit the nail right on the head" means
 - a. To do the right thing
 - b. To destroy one's reputation
 - c. To announce one's fixed views
 - d. To teach someone a lesson

 5. The missing number in the sequence 216, 343, -----, 729 is
 - a. 452
 - b. 553
 - c. 512
 - d. 668

 6. A train running at the speed of 60 km/hr crosses a pole in 9 seconds. What is the length of the train?
 - a. 120 metres
 - b. 180 metres
 - c. 324 metres
 - d. 150 metres

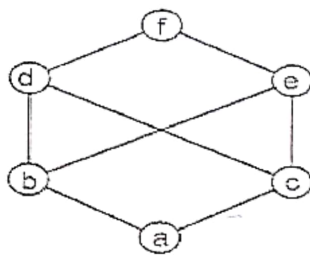
 7. Identify the largest fraction amongst following
 - a. $\frac{5}{6}$
 - b. $\frac{11}{13}$
 - c. $\frac{8}{9}$
 - d. $\frac{10}{14}$

8. The following table shows the number of students having scored different marks

Number of students	Marks obtained
9 - 11	6
11 - 13	5
13 - 15	2
15 - 17	2
17 - 19	5

What is the mean marks per student?

- a. 13.5
 - b. 12.25
 - c. 15.5
 - d. 14.25
9. Power set of empty or Null set has exactly _____ subset
- a. One
 - b. Two
 - c. Zero
 - d. Three
10. Let P: I am in Srinagar; Q: I love cricket; then $Q \rightarrow P$ (Q implies P) is?
- a. If I love cricket, then I am in Srinagar
 - b. If I am in Srinagar, then I love cricket
 - c. I am not in Srinagar if I love cricket
 - d. None of the above
11. The graph given below is an example of:



- a. non-lattice poset
- b. semilattice
- c. partial lattice
- d. bounded lattice

12. How many unique colors will be required for proper vertex coloring of a bipartite graph having n vertices?
- a. 0
 - b. 1
 - c. 2
 - d. N
13. The determinant of the matrix whose eigen values are 7, 1, 9 is given by _____
- a. 7
 - b. 63
 - c. 9
 - d. 17
14. What is the value of k for which the following system of linear equations has a non-trivial solution?
- $$\begin{aligned}x + 2y - z &= 0 \\2x + y + z &= 0 \\X - y + kz &= 0\end{aligned}$$
- a. 4
 - b. 2
 - c. 3
 - d. -4
15. If A is $m \times n$ matrix such that AB & BA both are defined, then B is a matrix of orde
- a. $n \times n$
 - b. $m \times m$
 - c. $m \times n$
 - d. $n \times m$
16. Matrix which does not have an inverse by solving it, is classified as which of the following?
- a. unidentified matrix
 - b. linear matrix
 - c. non-singular matrix
 - d. singular matrix

17. What is the minimum value of $f(x,y)=x^2 + y^2 + 6x + 12$?
- 3
 - 3
 - 9
 - 9
18. What is the value of limit $y \rightarrow 2 [(y^2 - 4)/(y - 2)]$?
- 2
 - 4
 - 1
 - 0
19. If a continuous function $f(x)$ does not have a root in the interval $[a, b]$ then which one of the following is TRUE?
- $f(a) \cdot f(b) = 0$
 - $f(a) \cdot f(b) < 0$
 - $f(a) \cdot f(b) > 0$
 - $f(a) \cdot f(b) \leq 0$
20. The derivative of $\cos x$ with respect to $\sin x$ is
- $\tan x$
 - $-\tan x$
 - $\cot x$
 - $-\cot x$
21. What will be the value of $P(\text{not } E)$ if $P(E) = 0.07$?
- 90
 - 0.07
 - 0.93
 - 72
22. A meeting has 12 employees. Given that 8 of the employees is a woman, find the probability that all the employees are women?
- $11/23$
 - $12/35$
 - $2/9$
 - $1/8$

23. If 'm' is the mean of a Poisson Distribution, then variance is given by
-
- a. $m/2$
 - b. m^2
 - c. m
 - d. $m^{1/2}$
24. If random variable X is binomially distributed with parameters $n = 5$, $p = 0,4$, then the third factorial moment of Y equals
- a. 0.384
 - b. 3.84
 - c. 0,768
 - d. 7.68
25. What is the primary motivation for using Boolean algebra to simplify logic expressions?
- a. It may make it easier to understand the overall function of the circuit
 - b. It may reduce the number of gates.
 - c. It may reduce the number of inputs required.
 - d. All of the above
26. Convert binary 1101100 to hex
- a. 4F
 - b. 6C
 - c. A5
 - d. 6D
27. When an Asynchronous sequential circuit changes two or more binary states variables a condition occurs called _____
- a. Race condition
 - b. deadlock condition
 - c. Running condition
 - d. None of these
28. Simplification of the expression: $XY' + X' + Y'X'$ is:
- a. $X' + Y$
 - b. XY'
 - c. $(XY)'$
 - d. $Y' + X$

29. What does MIMD stand for?
- Multiple Instruction Memory Data
 - Multiple Instruction Multiple Data
 - Memory Instruction Multiple Data
 - Memory Information Memory Data
30. Which of the following is page fault?
- Page fault occurs when a program accesses a page of another program
 - Page fault occurs when a program accesses a page in main memory
 - Page fault occurs when there is an error in particular page
 - Page fault occurs when a program accesses a page which is not present in main memory
31. _____ addressing mode is most suitable to change the normal sequence of execution of instructions
- Relative
 - Indirect
 - Index with Offset
 - Immediate
32. Which of the following statements is false?
- In the immediate addressing mode operand is placed in the instruction itself.
 - One-byte machine instruction consists of only the operand.
 - Indirect addressing mode is suitable for implementing pointers in C.
 - Displacement addressing mode is similar to the register indirect addressing mode.
33. Which one of the following is an application of Stack Data Structure?
- Managing function calls
 - The stock span problem
 - Arithmetic expression evaluation
 - All of the above

34. Which of the following is true about linked list implementation of stack?
- a. In push operation, if new nodes are inserted at the beginning of linked list, then in pop operation, nodes must be removed from end
 - b. In push operation, if new nodes are inserted at the end, then in pop operation, nodes must be removed from the beginning
 - c. Both (a) & (b)
 - d. None of the above
35. Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree?
- a. 7 5 1 0 3 2 4 6 8 9
 - b. 0 2 4 3 1 6 5 9 8 7
 - c. 0 1 2 3 4 5 6 7 8 9
 - d. 9 8 6 4 2 3 0 1 5 7
36. How many distinct binary search trees can be created out of 4 distinct keys?
- a. 4
 - b. 14
 - c. 24
 - d. 42
37. Which of the following statements about 0 1 Knapsack and Fractional Knapsack problem is correct?
- a. In 0 1 Knapsack items are divisible and in Fractional Knapsack items are indivisible,
 - b. Both are the same
 - c. 0 1 Knapsack is solved using Greedy Algorithm and Fractional Knapsack is solved using dynamic programming
 - d. In 0 1 Knapsack items are indivisible and in Fractional Knapsack items are divisible
38. What is the time complexity of Dijkstra's algorithm?
- a. $O(N)$
 - b. $O(N^3)$
 - c. $O(N^2)$
 - d. $O(\log N)$

39. When a top-down approach of dynamic programming is applied to a problem, it usually
- Decreases both, the time complexity and the space complexity
 - Decreases the time complexity and increases the space complexity
 - Increases the time complexity and decreases the space complexity
 - Increases both, the time complexity and the space complexity
40. What is the time complexity of Kruskal's algorithm?
- $O(\log V)$
 - $O(E \log V)$
 - $O(E^2)$
 - $O(V \log E)$
41. Which one of the following languages over the alphabet $\{0,1\}$ is described by the regular expression: $(0+1)^*0(0+1)^*0(0+1)^*$?
- The set of all strings containing the substring 00.
 - The set of all strings containing at most two zeros
 - The set of all strings containing at least two zeros
 - The set of all strings that begin and end with either 0 or 1.
42. Which one of the following is FALSE?
- There is unique minimal Deterministic Finite Automata (DFA) for every regular language
 - Every Non-deterministic Finite Automata (NFA) can be converted to an equivalent Push Down Automata (PDA).
 - Complement of every context-free language is recursive.
 - Every nondeterministic Push Down Automata (PDA) can be converted to an equivalent deterministic Push Down Automata (PDA).
43. Which of the following pairs have DIFFERENT expressive power?
- Deterministic finite automata(DFA) and Non-deterministic finite automata(NFA)
 - Deterministic push down automata(DPDA)and Non-deterministic push down automata(NPDA)
 - Deterministic single-tape Turing machine and Non-deterministic single-tape Turing machine
 - Single-tape Turing machine and multi-tape Turing machine

44. Given the language $L = \{ab, aa, baa\}$, which of the following strings are in L^* ?
- (I) abaabaaabaa
 - (II) aaaabaaaa
 - (III) baaaaabaaaab
 - (IV) baaaaabaa
- a. (I), (II) and (III)
 - b. (II), (III) and (IV)
 - c. (I), (II) and (IV)
 - d. (I), (III) and (IV)
45. Which of the following derivations does a top-down parser use while parsing an input string? The input is assumed to be scanned in left to right order.
- a. Leftmost derivation
 - b. Leftmost derivation traced out in reverse
 - c. Rightmost derivation
 - d. Rightmost derivation traced out in reverse
46. The process of assigning load addresses to the various parts of the program and adjusting the code and data in the program to reflect the assigned addresses is called?
- a. Assembly
 - b. Parsing
 - c. Relocation
 - d. Symbol resolution
47. Which of the following statements is false?
- a. An unambiguous grammar has same leftmost and rightmost derivation
 - b. An LL(1) parser is a top-down parser
 - c. LALR is more powerful than SLR
 - d. An ambiguous grammar can never be LR(k) for any k

48. Which of the following grammar rules violate the requirements of an operator grammar? P, Q, R are non-terminals, and r,s,t are terminals.
- (I) $P \rightarrow QR$
 - (II) $P \rightarrow QsR$
 - (III) $P \rightarrow \epsilon$
 - (IV) $P \rightarrow QtRr$
- a. (I) only
 - b. (I) and (III) only
 - c. (II) and (III) only
 - d. (III) and (IV) only
49. In round robin CPU scheduling as time quantum is increased the average turn around time
- a. Increases
 - b. Decreases
 - c. Remains constant
 - d. Varies irregularly
50. Suppose a system has 12 instances of some resource with n processes competing for that resource. Each process may require 4 instances of the resource. The maximum value of n for which the system never enters into deadlock is
- a. 3
 - b. 4
 - c. 5
 - d. 6
51. Virtual Memory can be implemented via?
- a. Simple division
 - b. Logical paging
 - c. Demand Paging
 - d. Complex division
52. A high priority process is treated _____ a low priority process, with either equal or proportional algorithm
- a. lesser than
 - b. greater than
 - c. same as
 - d. lesser or greater than depending on the algorithm

53. Aggregation is
- Result of taking the union of two or more disjoint (lower – level) entity sets to produce a higher-level entity set.
 - Express the number of entities to which another entity can be associated via a relationship set
 - Result of taking a subset of a higher level entity set to form a lower level entity set
 - An abstraction through which relationships are treated as higher level entities
54. When an E-R diagram is mapped to tables, the representation is redundant for
- weak entity sets
 - weak relationship sets
 - strong entity sets
 - strong relationship sets
55. If a transaction T has obtained an exclusive lock on item Q, then T can
- read Q
 - Write Q
 - both read and write Q
 - write Q but not read Q
56. Domain constraints, functional dependency and referential integrity are special forms of -----
- Foreign key
 - Primary key
 - Assertion
 - Referential constraint
57. Ether LAN uses
- Polar encoding
 - Differential Manchester encoding
 - Manchester encoding
 - NRZ
58. Which of the following devices understands the format and contents of the data and translates message from one format to another?
- Hub
 - Router
 - Switch
 - Gateway

59. In which routing method do all the routers have a common database?

- a. Distance Vector
- b. Link Vector
- c. Shortest path
- d. Link State

60. In public key cryptosystem which one of the following is kept as public?

- a. Decryption keys
- b. Encryption keys
- c. Encryption & Decryption keys
- d. None of the above

