

ENTRANCE TEST-2026**SCHOOL OF APPLIED SCIENCES & TECHNOLOGY****2 – YEAR MASTER’S PROGRAMME IN COMPUTER APPLICATIONS**

Question Booklet Series

A

Total Questions : 60

Time Allowed : 70 Minutes

Entrance Test Roll No. :

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Mandatory Instructions for Candidates :

1. Candidates shall compulsorily use only **blue/ black ball point pen**. In no case gel/ink pen or pencil should be used.
2. Compulsorily write your **entrance test roll number** in the space provided at the top of this page of the question booklet.
3. Fill up the necessary information in the spaces provided on OMR Answer Sheet including **Question Booklet Number** and **Question Booklet Series**.
4. 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.
5. All entries in the OMR Answer Sheet, including answers to questions, are to be recorded in the Original Copy only.
6. **Choose only one correct/most appropriate response** for each question among the options A, B, C and D and darken the circle of the appropriate response completely. Incompletely darkened circle is not correctly read by the OMR scanner and no complaint to this effect shall be entertained.
7. **Do not darken more than one circle of option for any question. A question with more than one darkened response shall be considered wrong.**
8. **There will be negative marking for wrong answers. Each wrong answer will lead to deduction of 0.25 marks per wrong answer from the score.**
9. Only those candidates who obtain positive score in Entrance Test shall be eligible for admission.
10. Do not make any stray mark on the OMR Answer Sheet as this may lead to errors while scanning.
11. OMR answer sheet must be handled carefully and it should not be folded or mutilated, as in such case it will not be properly evaluated by the scanning machine.
12. Use of Electronic gadgets like calculator, mobile, smart watch, blue tooth etc. is strictly prohibited.
13. Rough work, if any, should be done on the blank sheets provided with the question booklet.
14. Ensure that the OMR Answer Sheet is signed by the Examinee as well as by the invigilator.
15. At the end of the examination, fold the OMR Answer Sheet along the crease on the top and tear off the top strip to separate the Original OMR Answer Sheet from the Duplicate Copy.
16. Compulsorily hand over the **Original OMR Answer Sheet** to the invigilator.
17. Candidate's can retain duplicate copy of the OMR, Question Booklet and Admit Card.
18. 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.
19. Any deficiency on the OMR shall be the responsibility of the candidate himself/herself.

1. The minimum value of $f(x,y) = x^2 + y^2 + 6x + 12$ is: 6.
 - (A) 3
 - (B) 6
 - (C) 9
 - (D) 12
2. The factorization of $x^2 - 9$ is:
 - (A) $(x-9)(x+1)$
 - (B) $(x-3)(x+3)$
 - (C) $(x-1)(x-9)$
 - (D) $(x+9)(x-1)$
3. Number of squares on a standard 8×8 chessboard is:
 - (A) 64
 - (B) 160
 - (C) 204
 - (D) 224
4. If the roots of the quadratic equation $ax^2 + bx + c = 0$ are equal, then:
 - (A) $b^2 - 4ac > 0$
 - (B) $b^2 - 4ac < 0$
 - (C) $b^2 - 4ac = 0$
 - (D) $b^2 - 4ac = \infty$
5. The sum of first (n) terms of an arithmetic progression is:
 - (A) $\frac{n}{2}[2a + (n-1)d]$
 - (B) $a + (n-1)d$
 - (C) $ar^{(n-1)}$
 - (D) $\frac{a}{1-r}$
6. Which protocol is widely used in IoT applications?
 - (A) FTP
 - (B) SMTP
 - (C) MQTT
 - (D) POP3
7. Which IoT technology is most suitable for low-power sensor networks?
 - (A) ZigBee
 - (B) Ethernet
 - (C) DSL
 - (D) LTE only
8. In SDN, forwarding decisions are mainly made by:
 - (A) Traditional routers
 - (B) Centralized controller
 - (C) DNS server
 - (D) End users
9. The key feature of ZigBee compared to Wi-Fi is:
 - (A) Higher bandwidth
 - (B) Lower latency
 - (C) Lower power consumption
 - (D) Longer optical range
10. Smart Dust applications include:
 - (A) Battlefield surveillance
 - (B) Environmental monitoring
 - (C) Industrial sensing
 - (D) All of the above

11. If two events are independent, then:
- (A) $P(A \cap B) = P(A) + P(B)$
 - (B) $P(A \cap B) = P(A)P(B)$
 - (C) $P(A) = P(B)$
 - (D) None
12. Which distribution is used for rare events?
- (A) Normal
 - (B) Binomial
 - (C) Poisson
 - (D) Uniform
13. A committee of two persons is selected from two men and two women. The probability that the committee will have no men is _____.
- (A) 1/6
 - (B) 1/3
 - (C) 1/4
 - (D) 3/4
14. Standard deviation measures:
- (A) Central tendency
 - (B) Dispersion
 - (C) Probability
 - (D) Correlation
15. For a positively skewed distribution:
- (A) Mean < Median
 - (B) Mean = Median
 - (C) Mean > Median
 - (D) Mean = Mode
16. Which of the following statements regarding cache memory is TRUE?
- (A) Cache memory is slower than RAM
 - (B) Cache memory is used for permanent storage
 - (C) Cache memory exploits locality of reference
 - (D) Cache memory is part of secondary storage
17. A computer with 32-bit address bus can directly access a maximum of:
- (A) (2^{16}) bytes
 - (B) (2^{24}) bytes
 - (C) (2^{32}) bytes
 - (D) (2^{64}) bytes
18. Firmware is:
- (A) Application software
 - (B) Software permanently stored in ROM
 - (C) Secondary memory
 - (D) Compiler software
19. Which memory has the fastest access time?
- (A) Magnetic Disk
 - (B) RAM
 - (C) Cache
 - (D) CPU Registers
20. Which generation of computers introduced integrated circuits?
- (A) First
 - (B) Second
 - (C) Third
 - (D) Fourth
21. The binary equivalent of decimal 45 is:
- (A) 101101
 - (B) 110101
 - (C) 111001
 - (D) 100111
22. Convert binary 1101.11 to decimal:
- (A) 12.75
 - (B) 13.75
 - (C) 14.5
 - (D) 15.25

23. Cache memory works on principle of:

- (A) Locality of reference
- (B) Recursion
- (C) Paging
- (D) Segmentation

24. What is the purpose of the clock in a CPU?

- (A) To store data
- (B) To generate timing signals for the CPU's operations
- (C) To handle input and output operations
- (D) To manage memory access

25. What type of binary representation is used to represent both positive and negative numbers?

- (A) Sign-magnitude
- (B) One's complement
- (C) Two's complement
- (D) All of the above

26. What is the output?

```
#include<stdio.h>
int main()
{
    int x = 10;
    int *p = &x;
    printf("%d", *p + 5);
}
```

- (A) 5
- (B) 10
- (C) 15
- (D) Address of x

27. What will be the output?

```
#include<stdio.h>
void fun(int *p)
{
    *p = 20;
}
int main()
{
    int x = 10;
    fun(&x);
    printf("%d", x);
}
```

- (A) 10
- (B) 20
- (C) Garbage value
- (D) Compilation error

28. What will be the output?

```
#include<stdio.h>
int main()
{
    int arr[3] = {1,2,3};
    printf("%d", *(arr+1));
}
```

- (A) 1
- (B) 2
- (C) 3
- (D) Garbage value

29. What is the output?
- ```
#include<iostream>
using namespace std;
class Test{
public:
 Test(){
 cout<<"Constructor ";
 }
 ~Test(){
 cout<<"Destructor";
 }
};
int main(){
 Test t;
}
```
- (A) Constructor Destructor  
(B) Destructor Constructor  
(C) Constructor only  
(D) Destructor only
30. How many destructors can a C++ class have?
- (A) One  
(B) Two  
(C) Multiple if overloaded  
(D) Unlimited
31. Which normal form removes partial dependency?
- (A) 1NF  
(B) 2NF  
(C) 3NF  
(D) BCNF
32. Which SQL clause is used with aggregate functions?
- (A) WHERE  
(B) HAVING  
(C) ORDER BY  
(D) DISTINCT
33. Which concurrency control problem occurs when one transaction overwrites another transaction's update?
- (A) Dirty read  
(B) Lost update  
(C) Phantom read  
(D) Cascading rollback
34. Which normal form removes transitive dependency?
- (A) 1NF  
(B) 2NF  
(C) 3NF  
(D) BCNF
35. Which transaction property guarantees that all operations complete successfully or none occur?
- (A) Consistency  
(B) Isolation  
(C) Durability  
(D) Atomicity
36. Time complexity of binary search with recurrence relation given below is:  
 $T(n) = T(n/2) + 1$
- (A)  $O(n)$   
(B)  $O(\log n)$   
(C)  $O(n \log n)$   
(D)  $O(1)$
37. What is the major advantage of recursion?
- (A) Faster execution always  
(B) Reduced memory usage  
(C) Elegant solution for divide-and-conquer problems  
(D) Eliminates function calls
38. An undirected graph G has n nodes. Its adjacency matrix is given by an  $n \times n$  square matrix whose
- (i) diagonal elements are 0's and  
(ii) non-diagonal elements are 1's.
- Which one of the following is TRUE?
- (A) Graph G has no Minimum Spanning Tree (MST)  
(B) Graph G has a unique MST of cost  $n-1$   
(C) Graph G has multiple distinct MSTs, each of cost  $n-1$   
(D) Graph G has multiple spanning trees of different costs

39. Which situation leads to memory leak?
- (A) Accessing NULL pointer
  - (B) Freeing allocated memory twice
  - (C) Dynamically allocated memory not released
  - (D) Stack overflow
40. Which traversal gives sorted order in BST?
- (A) Preorder
  - (B) Postorder
  - (C) Inorder
  - (D) Level order
41. fork() system call creates:
- (A) Thread
  - (B) Child process
  - (C) Semaphore
  - (D) File
42. FIFO page replacement may suffer from:
- (A) Starvation
  - (B) Belady's anomaly
  - (C) Deadlock
  - (D) Fragmentation
43. Which scheduling algorithm may cause starvation?
- (A) Round Robin
  - (B) FCFS
  - (C) Priority Scheduling
  - (D) SJF Preemptive
44. Which of the following is NOT a Coffman deadlock condition?
- (A) Mutual Exclusion
  - (B) Hold and Wait
  - (C) Preemption
  - (D) Resource Sharing
45. Consider three CPU-intensive processes, which require 10, 20 and 30-time units and arrive at times 0, 2 and 6, respectively. How many context switches are needed if the operating system implements the remaining time first scheduling algorithm? Do not count the context switches at time zero and at the end.
- (A) 1
  - (B) 2
  - (C) 3
  - (D) 4
46. Min-Max algorithm is used in:
- (A) DBMS
  - (B) Game playing
  - (C) Networking
  - (D) Compression
47. Who is known as the father of Artificial Intelligence?
- (A) Alan Turing
  - (B) John McCarthy
  - (C) Marvin Minsky
  - (D) Claude Shannon
48. Which search strategy expands the shallowest node first?
- (A) DFS
  - (B) BFS
  - (C) Hill Climbing
  - (D) A\* Search
49. Which search algorithm guarantees the shortest path in an unweighted graph?
- (A) DFS
  - (B) BFS
  - (C) Hill Climbing
  - (D) Greedy Search

50. The evaluation function in  $A^*$  search is:  
where  $(g(n))$  is path cost and  $(h(n))$  is heuristic estimate.
- (A)  $(f(n) = g(n) - h(n))$
  - (B)  $(f(n) = g(n) + h(n))$
  - (C)  $(f(n) = g(n) h(n))$
  - (D)  $(f(n) = h(n) - g(n))$
51. Language accepted by DFA is:
- (A) Context free
  - (B) Recursive
  - (C) Regular
  - (D) Context sensitive
52. CNF stands for:
- (A) Canonical Normal Form
  - (B) Chomsky Normal Form
  - (C) Context Normal Form
  - (D) Compiler Normal Form
53. Which of the following strings is in  $L^*$  given the language  $L = \{ab, aa, baa\}$ ?
- (A) abbbbaababababaa
  - (B) aaaabaaaabbbaaab
  - (C) baaaaabaaaab
  - (D) baaaaabaa
54. In order to perform lexical analysis for a modern language like Java, which of the following machine models is required and sufficient?
- (A) Finite state automata
  - (B) Deterministic pushdown automata
  - (C) Non-deterministic pushdown automata
  - (D) Turing machine
55. Which one of the following statements is FALSE?
- (A) Every regular language has its own minimal DFA
  - (B) Every NFA can be converted to a PDA of the same size
  - (C) Every context-free language's complement is recursive
  - (D) Any non-deterministic PDA can be converted to a deterministic equivalent
56. What is the bit rate In Ethernet when Manchester encoding is used?
- (A) Same as the baud rate
  - (B) Twice the baud rate
  - (C) Half the baud rate
  - (D) None of these
57. What is the Address Resolution Protocol (ARP) used for?
- (A) Finding the IP address of the default gateway
  - (B) Finding the MAC address that corresponds to an IP address
  - (C) Finding the IP address that corresponds to a MAC address
  - (D) Finding the IP address from the DNS
58. Which routing algorithm may suffer from count-to-infinity problem?
- (A) Link State Routing
  - (B) Flooding
  - (C) Distance Vector Routing
  - (D) Source Routing
59. Which field changes at every router hop in an IPv4 packet?
- (A) Source Address
  - (B) Destination Address
  - (C) TTL
  - (D) Protocol
60. The protocol used for path MTU discovery relies primarily on:
- (A) ARP
  - (B) ICMP
  - (C) DHCP
  - (D) RIP

# ROUGH WORK

SEAL

