



COA 306

B.A./B.Sc. VIth SEMESTER EXAMINATION, 2024-25

COMPUTER APPLICATION

(Algorithms & Data Structure)

AFFIX PRESCRIBED
RUBBER STAMP

Paper ID

(To be filled in the
OMR Sheet)

Date (तिथि) : _____

5556

अनुक्रमांक (अंकों में) :

Roll No. (In Figures) :

अनुक्रमांक (शब्दों में) :

Roll No. (In Words) : _____

Time : 1:30 Hrs.

समय : 1:30 घण्टे

Max. Marks : 75

अधिकतम अंक : 75

नोट : पुस्तिका में 50 प्रश्न दिये गये हैं, सभी प्रश्न करने होंगे। प्रत्येक प्रश्न 1.5 अंक का होगा।

Important Instructions :

1. The candidate will write his/her Roll Number only at the places provided for, i.e. on the cover page and on the OMR answer sheet at the end and nowhere else.
2. Immediately on receipt of the question booklet, the candidate should check up the booklet and ensure that it contains all the pages and that no question is missing. If the candidate finds any discrepancy in the question booklet, he/she should report the invigilator within 10 minutes of the issue of this booklet and a fresh question booklet without any discrepancy be obtained.

महत्वपूर्ण निर्देश :

1. अभ्यर्थी अपने अनुक्रमांक केवल उन्हीं स्थानों पर लिखेंगे जो इसके लिए दिये गये हैं, अर्थात् प्रश्न पुस्तिका के मुख्य पृष्ठ तथा साथ दिये गये ओ०एम०आर० उत्तर पत्र पर, तथा अन्यत्र कहीं नहीं लिखेंगे।
2. प्रश्न पुस्तिका मिलते ही अभ्यर्थी को जाँच करके सुनिश्चित कर लेना चाहिए कि इस पुस्तिका में पूरे पृष्ठ हैं और कोई प्रश्न छूटा तो नहीं है। यदि कोई विसंगति है तो प्रश्न पुस्तिका मिलने के 10 मिनट के भीतर ही कक्ष परिप्रेक्षक को सूचित करना चाहिए और बिना त्रुटि की दूसरी प्रश्न पुस्तिका प्राप्त कर लेना चाहिए।

1. Which of the following is not the type of Linked List ?
 - (A) Singly Linked List
 - (B) Doubly Linked List
 - (C) Circular Linked List
 - (D) Ordinary Queue
2. Which algorithm is used in the top tree data structure ? (By Solving Sub problems)
 - (A) Back Tracking
 - (B) Divide and Conquer
 - (C) Branch & Bound
 - (D) Greedy
3. Which of the following is the most widely used external memory data structure?
 - (A) B-Tree
 - (B) Red-Black Tree
 - (C) AVL Tree
 - (D) STACK
4. Which is follow LIFO property ?
 - (A) Tree
 - (B) STACK
 - (C) Queue
 - (D) Linked List
5. The prefix form of $A-B/(C*D^E)$ is :
 - (A) $-A/B* C^DE$
 - (B) $-A/B C* ^DE$
 - (C) $-ABCD*^DE$
 - (D) $-/*^ACBDE$

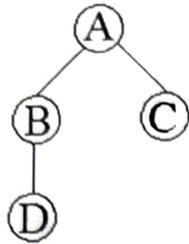
6. How can you write two statements into one char *p;
P= (Char*) malloc (100);
- (A) Char P = * malloc (100);
 - (B) Char * P = (char) malloc (100);
 - (C) Char * P = (char *) malloc (100);
 - (D) Char * P = (char *) (malloc *) (100);
7. Queue follows which of the following property ?
- (A) FIFO
 - (B) LIFO
 - (C) Both (A) & (B)
 - (D) None
8. Stack follows which of the following property ?
- (A) FIFO
 - (B) LIFO
 - (C) Both (A) & (B)
 - (D) None
9. Application of Queue is in _____ .
- (A) Breadth First Search
 - (B) Depth First Search
 - (C) Both (A) & (B)
 - (D) None
10. What are the disadvantages of an array ?
- (A) Memory Wastage
 - (B) Fixed Memory
 - (C) Only for Homogeneous elements
 - (D) All of the above

11. The persons stand in front of window for railway reservation is the example of:
- (A) Queue
 - (B) Stack
 - (C) Linked List
 - (D) None
12. The data structure required for breadth first traversal on a graph is _____ .
- (A) Array
 - (B) Stack
 - (C) Tree
 - (D) Queue
13. What is the value of the postfix expression $6324 + - *$?
- (A) 74
 - (B) -18
 - (C) 22
 - (D) 40
14. Which data structure is needed to convert infix notation to postfix notation ?
- (A) Tree
 - (B) STACK
 - (C) Queue
 - (D) Heap
15. What is time complexity of bubble sort ?
- (A) $O(n^2)$
 - (B) $O(n)$
 - (C) $O(\log n)$
 - (D) $O(1)$

16. What is the time complexity of merge sort ?
- (A) $O(n \log n)$
 - (B) $O(n)$
 - (C) $O(1)$
 - (D) None
17. What is the worst time complexity of Quick Sort ?
- (A) $O(n^2)$
 - (B) $O(\log n)$
 - (C) $O(n \log n)$
 - (D) $O(1)$
18. Which data structure follow FIFO property ?
- (A) STACK
 - (B) QUEUE
 - (C) Linked List
 - (D) Heap
19. The optimal data structure used to solve Tower of Hanoi is _____ .
- (A) Tree
 - (B) Heap
 - (C) Priority Queue
 - (D) Stack
20. Which data structure is used for recursion ?
- (A) STACK
 - (B) QUEUE
 - (C) LIST
 - (D) ARRAY

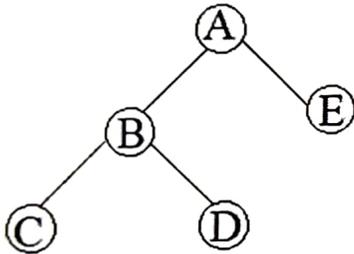
21. What is the time complexity of Linear Search ?
- (A) $O(n^2)$
 - (B) $O(n)$
 - (C) $O(\log n)$
 - (D) $O(1)$
22. What is the time complexity of Binary Search ?
- (A) $O(n)$
 - (B) $O(\log n)$
 - (C) $O(n \log n)$
 - (D) $O(1)$
23. Which approach is used by Binary Search ?
- (A) Dynamic Programming
 - (B) Greedy
 - (C) DAC
 - (D) None
24. What is the approach of Heap Sort ?
- (A) Root $>$ (Left & Right Child) - MAX HEAP
 - (B) Root $<$ (Left & Right Child) - MIN HEAP
 - (C) Both (A) & (B)
 - (D) None
25. Prim's algorithm is the example of _____.
- (A) Greedy algorithm
 - (B) Dynamic Programming
 - (C) Divide and Conquer
 - (D) None of the above

26. The Preorder of the following tree is _____.



- (A) ABDC
- (B) DBAC
- (C) CABD
- (D) ABCD

27. The post order traversal of tree is _____.

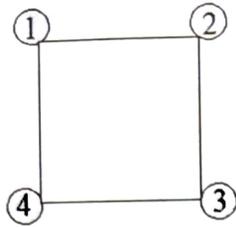


- (A) CDBEA
- (B) ABCDE
- (C) ACDBE
- (D) ACDEB

28. If a Graph have only one node is called _____.

- (A) Trivial Graph
- (B) Null Graph
- (C) Connected Graph
- (D) Regular Graph

29. The following graph is called _____.



- (A) Disconnected Graph
 - (B) 2-Regular Graph
 - (C) Trivial Graph
 - (D) Complete Graph
30. All Keywords in C are in -
- (A) Lower Case Letter
 - (B) Upper Case Letter
 - (C) Cannel Case Letter
 - (D) None of these
31. What is an example of utionation in C ?
- (A) For
 - (B) While
 - (C) Do-While
 - (D) All of the above
32. Which of the following is a loop in C ?
- (A) If-else
 - (B) Switch
 - (C) For
 - (D) Return

33. Which keyword can be used for coming out of recursion ?
- (A) Break
 - (B) Return
 - (C) Exit
 - (D) Both break and return
34. What is/are the applications of stack ?
- (A) Recursion
 - (B) Postfix conversion
 - (C) Back Tracking
 - (D) All of the above
35. Which is valid C expression ?
- (A) `int my-num =100,000;`
 - (B) `int my-num =1000;`
 - (C) `int my-num = 100;`
 - (D) `int $ my-num = 1000;`
36. Which of the following is an application of stack data structure ?
- (A) Managing function calls
 - (B) The stock span problem
 - (C) Arithmetic expression evolution
 - (D) All of the above
37. The minimum numbers of stacks needed to implement a queue is _____.
- (A) 3
 - (B) 1
 - (C) 2
 - (D) 4

38. Which of the following is an application of queue data structure ?
- (A) When a resource is shared among multiple consumers
 - (B) When data is transferred asynchronously between two process
 - (C) Load balancing
 - (D) All of the above
39. The average depth of a binary search tree is _____.
- (A) $O(n^{0.5})$
 - (B) $O(n)$
 - (C) $O(\log n)$
 - (D) $O(n \log n)$
40. Which of the following correctly declares an array ?
- (A) `int ddu [20];`
 - (B) `int ddu;`
 - (C) `int ddu [];`
 - (D) `array ddu [20];`
41. Which of the following is a linear data structure ?
- (A) AVL Tree
 - (B) Array
 - (C) B-Tree
 - (D) Graph
42. Which of the following is not the type of queue ?
- (A) Priority Queue
 - (B) Single-Ended Queue
 - (C) Circular Queue
 - (D) Ordinary Queue

43. What is the advantages of an array ?
- (A) Mixed data types
 - (B) Fixed memory
 - (C) Memory Wastages
 - (D) Easier to Access Element
44. When a PoP() operation is called on an empty queue, what is the condition called ?
- (A) Overflow
 - (B) Underflow
 - (C) Syntax error
 - (D) Garbage value
45. What is the disadvantage of array ?
- (A) Simplicity
 - (B) Constant accessed time
 - (C) Fixed memory size
 - (D) None of these
46. Which of the following data structures can be used to implement queues ?
- (A) Stack
 - (B) Arrays
 - (C) Linked List
 - (D) All of the above
47. Which of the following is a divide and conquer algorithm ?
- (A) Bubble Sort
 - (B) Selection Sort
 - (C) Heap Sort
 - (D) Merge Sort

48. What is the best case time complexity of the binary search algorithm ?
- (A) $O(1)$
 - (B) $O(n)$
 - (C) $O(\log n)$
 - (D) $O(n^2)$
49. Which can be done with Linked List ?
- (A) Implementation of Stacks and Queues
 - (B) Implementation of Binary Trees
 - (C) Insertion of Elements
 - (D) All of the above
50. Which of the following represents the post order traversal of a binary tree ?
- (A) Left \rightarrow Right \rightarrow Root
 - (B) Right \rightarrow Left \rightarrow Root
 - (C) Root \rightarrow Left \rightarrow Right
 - (D) Left \rightarrow Root \rightarrow Right
