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PAPER – II

COMPUTER SCIENCE AND APPLICATIONS

Signature of the Invigilator

Question Booklet No. ..... 100770 .....

1.

OMR Sheet No.. .....

Subject Code | 10 |

ROLL No. | | | | | | | | |

Time Allowed : 75 Minutes

Max. Marks : 100

No. of pages in this Booklet : **8**

No. of Questions : **50**

INSTRUCTIONS FOR CANDIDATES

1. Write your Roll No. and the OMR Sheet No. in the spaces provided on top of this page.
2. Fill in the necessary information in the spaces provided on the OMR response sheet.
3. This booklet consists of fifty (50) compulsory questions each carrying 2 marks.
4. Examine the question booklet carefully and tally the number of pages/questions in the booklet with the information printed above. **Do not accept a damaged or open booklet.** Damaged or faulty booklet may be got replaced within the first **5** minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time given.
5. Each Question has four alternative responses marked (A), (B), (C) and (D) in the OMR sheet. You have to completely darken the circle indicating the most appropriate response against each item as in the illustration.



6. All entries in the common OMR response sheet for Papers I and II are to be recorded in the original copy only.
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10. You have to return the Original OMR Sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. **You are, however, allowed to carry the test booklet and the duplicate copy of OMR Sheet** on conclusion of examination.
11. Use of any calculator, mobile phone or log table etc. is strictly prohibited.
12. **There is no negative marking.**

10-16

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PAPER–II

COMPUTER SCIENCE AND APPLICATIONS

1. Black box testing is not good for detecting the following type of error :
   (A) Logic error
   (B) I /O error
   (C) Data handling error
   (D) Both (B) and (C)

2. Which technique is suitable for detecting database error in the program ?
   (A) Static analysis
   (B) White box testing
   (C) Black box testing
   (D) Code review

3. The small mistakes that do not impact the correct working of the software is which type of error ?
   (A) Minor (B) Cosmetic
   (C) Critical (D) Major

4. Cause-Effect Graphing is which type of testing technique ?
   (A) White box
   (B) Black box
   (C) Both (A) and (B)
   (D) Neither (A) nor (B)

5. Mutation testing is which type of testing technique
   (A) White box
   (B) Black box
   (C) Both (A) and (B)
   (D) Neither (A)nor(B)

6. The addition of two binary numbers without carries is same as ------ operation of the numbers :
   (A) AND (B) OR
   (C) XOR (D) NOR

7. Which of the following binary system has two zeros ?
   (A) Signed magnitude
   (B) 1's complement
   (C) Two's complement
   (D) None

8. In flip flops which of the following specifies the next state given the present state and inputs ?
   (A) Characteristic table (B) Excitation table
   (C) Truth table (D) State table

9. The output functions
   $X = A \text{ XOR } B \text{ XOR } C$
   $Y = A.B + (A \text{ XOR } B).C$
   are for :
   (A) Full adder (B) Full subtractor
   (C) Half adder (D) Multiplier

10. During addition operation an overflow occurs when :
    (A) Carry into sign bit position is equal to carry out of the sign bit position
    (B) Carry into sign bit position is not equal to carry out of the sign bit position
    (C) If the size of the register is not defined
    (D) If one number is positive and another is negative

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11. Routers operate on, in OSI model :
(A) Application layer
(B) Transport layer
(C) Physical layer
(D) Network layer

12. Bridge works on, in OSI model :
(A) Application layer (B) Transport layer
(C) Data link layer (D) Network layer

13. In the layer hierarchy as the data packet moves from the upper to the lower layers, headers are :
(A) Added (B) Removed
(C) Rearranged (D) Modified

14. Communication between a computer and a keyboard involves_____ transmission.
(A) Automatic (B) Half-duplex
(C) Full-duplex (D) Simplex

15. Which of the following is not present in TCP /IP model but present in OSI model ?
(A) Session layer and presentation layer
(B) Session layer only
(C) Presentation layer only
(D) Application layer

16. Which of the followinhg is DML command ?
(A) DROP (B) CREATE
(C) GRANT (D) UPDATE

17. A relation with set of FDs F is decomposed into two relations R1 and R2. The decomposition is lossless if and only if F^+ contains FD(s) :
(A) $R1 \cap R2 \rightarrow R1$ and $R1 \cap R2 \rightarrow R2$
(B) $R1 \cup R2 \rightarrow R1$ and $R1 \cup R2 \rightarrow R2$
(C) $R1 \cap R2 \rightarrow R1$ or $R1 \cap R2 \rightarrow R2$
(D) $R1 \cup R2 \rightarrow R1$ or $R1 \cup R2 \rightarrow R2$

18. A distributed DB system should appear like a centralized database. This property is termed as ----- transparency.
(A) Location (B) Network
(C) Replication (D) Fragmentation

19. Which one of the following represents the pseudo transitivity ?
(A) $X \rightarrow Y, Y \rightarrow Z \Longrightarrow X \rightarrow Z$
(B) $X \rightarrow Y, WY \rightarrow Z \Longrightarrow WX \rightarrow Z$
(C) $X \rightarrow Y, X \rightarrow Z \Longrightarrow X \rightarrow YZ$
(D) $WY \rightarrow Z \Longrightarrow W \rightarrow Z, Y \rightarrow Z$

20. A table having non-trivial MVD must have at least----- attributes, out of which------ must be multivalued.
(A) 3, 2 (B) 4, 3
(C) 5, 2 (D) 3,3

21. Reusability of the code can be achieved in C++ using :
(A) Polymorphism only
(B) Encapsulation only
(C) Inheritance only
(D) Polymorphism and inheritance

22. Class A, Class B and Class C are derived from class BASE. What type of inheritance is it ?
(A) Multiple (B) Multilevel
(C) Hierarchical (D) Single

23. Which of the following is correct ?
(A) Private member is not inheritable and not accessible in derived class
(B) Protected member is inheritable and also accessible in derived class
(C) Both are inheritable but private is accessible in the derived class
(D) Both are inheritable but protected is not accessible in the derived class

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24. In case of inheritance where both base and derived class are having constructors, when an object of derived class is created then_____.

(A) First constructor of derived class will be invoked

(B) First constructor of base class will be invoked

(C) Constructor of derived classs will be executed first followed by base class

(D) Constructor of base class will be executed first followed by derived class

25. In case of operator overloading, operator function must be_____.

1. Static member functions
2. Non-static member functions
3. Friend functions

(A) Only 2 (B) Only 1, 3

(C) Only 2, 3 (D) All 1, 2, 3

26. The operating system manages :

(A) Memory only

(B) The processor only

(C) Files only

(D) Processor, memory, file

27. Which of the following is not a component of a user account ?

(A) Home directory

(B) Password directory

(C) Group ID

(D) Kernel

28. The superuser is---------of UNIX.

(A) Master (B) Supreme

(C) Root (D) President

29. To use a Unix System with a GUI you need this type of window to enter Unix commands :

(A) Terminal (B) Dialog box

(C) Menu (D) Command

30. Links are :

(A) Pipes

(B) Pointer to other files only

(C) Dummy filenames in the directory only

(D) Pointer to other files and dummy filenames in the directory

31. Given the following sorting algorithms :

(i) Insertion

(ii) Heapsort

(iii) Mergesort

Which of the following are in-place sorting algorithms ?

(A) Only (i) and (ii) (B) Only (i) and (iii)

(C) Only (ii) and (iii) (D) (i), (ii) and (iii)

32. Given the following two grammars :

$G_1 : S \rightarrow AB|00B$

$A \rightarrow 0|A_0$

$B \rightarrow 1$

$G_2 : S \rightarrow 0S1S|1S0S|\lambda$

Which statement is correct ?

(A) G_1 is unambiguous and G_2 is unambiguous

(B) G_1 is unambiguous and G_2 is ambiguous

(C) G_1 is ambiguous and G_2 is unambiguous

(D) G_1 is ambiguous and G_2 is ambiguous

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33. The context free grammar for the language $L=\{b^n a^m | n \leq m+3, n \geq 0, m \geq 0\}$ is

(A) $S \rightarrow bbbA;\ A \rightarrow bAa \mid B; B \rightarrow Ba \mid \lambda$

(B) $S \rightarrow bbbA \mid \lambda; A \rightarrow bAa \mid B; B \rightarrow Ba \mid \lambda$

(C) $S \rightarrow bbbA \mid bbA \mid \lambda; A \rightarrow bAa \mid B; B \rightarrow Ba \mid \lambda$

(D) $S \rightarrow bbbA \mid bbA \mid bA \mid \lambda;\ A \rightarrow bAa \mid B;$
$B \rightarrow Ba \mid \lambda$

34. Which of the following symbol table information makes efficient use of memory?

(A) List (B) Hash table

(C) Self organization list (D) Search tree

35. Consider the grammar

$S \rightarrow AB \mid SB \mid AS$

$A \rightarrow a$

$B \rightarrow b$

To set a string of m terminals, the number of production to be used is_____.

(A) m^2 (B) $2m$

(C) $2m - 1$ (D) $m + 1$

36. The intersection of a context free language and a regular language

(A) Need not be a regular

(B) Need not be context free

(C) Is always context free

(D) Is always context sensitive

37. Shift reduce parsers are :

(A) Top down parsers

(B) Bottom up parsers

(C) Bottom up for reduce and top down for shift

(D) Bottom up for shift and top down for reduce

38. The reverse polish notations equivalent to the infix expression :

$((B+C)*D+E)/(F+G+A)$

(A) $BC+D*E+FG+A+/$

(B) $BC+DE*+FG+A+/$

(C) $BC+D*E+FGA++/$

(D) $BC+D*E+F+GA+/$

39. Suppose you are debugging a quick sort or implementation that is supposed to sort an array in ascending order. After the first partition step has been completed, the contents of the array are in the following order :

4 10 2 15 18 25 23 21

Which of the following statements is correct about the partition step ?

(A) The pivot could have been either 15 or 18

(B) The pivot could have been 15, but could not have been 18

(C) The pivot could have been 18, but could not have been 15

(D) Neither 15 nor 18 could have been the pivot

40. How many times is the symbol '#' printed by the call f00 (4) ?

```
Void f00(int ż){
    if (ż>1){
    f00(ż/z)
    f00(ż/z)
    }
  Count<<"#";
 }
```

(A) 3 (B) 4

(C) 5 (D) 7

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41. A graph is planar if and only if it does not contain any subgraph that is isomorphic to within vertices of degree 2 to

(A) $K_{3,2}$ and K_5 (B) $K_{3,2}$ and K_6

(C) $K_{3,3}$ or K_5 (D) $K_{3,3}$ or K_6

42. The number of ways of selecting r objects from n objects with unlimited repetitions is :

(A) P (n, r) (B) P (n + r - 1, r)

(C) C (n, r) (D) C (n + r - 1, r)

43. An undirected graph possess an eulerian path if and only if it is connected and has :

(A) Either zero or even number of vertices of odd degree

(B) Either zero or odd number of vertices of even degree

(C) Either zero or two vertices of even degree

(D) Either zero or two vertices of odd degree

44. Let g and h be the function from the set of integers to the set of integers defined by $g(x) = 2x + 3$ and $h(x) = 3x + 2$

Then the composition of g and h, and h and g is given as :

(A) $5x + 5, 5x + 5$

(B) $6x + 7, 6x + 7$

(C) $6x + 7, 6x + 11$

(D) $6x + 11, 6x + 7$

45. Given the relation $R = \{(2, 3), (3, 4)\}$. The minimum number of ordered pairs that must be added to this set so that the enlarged relation is reflexive, symmetric and transitive is :

(A) 7 (B) 6

(C) 5 (D) 4

46. The number of elements in the power set of the set $\{\{\{\}\}, 1, 2, \{3, 4\}\}$ is :

(A) 2 (B) 4

(C) 8 (D) 16

47. Given an undirected graph G with 51 nodes. The maximum number of edges that can be included, so that the graph G has two connected components, is :

(A) 2652 (B) 2550

(C) 1326 (D) 1275

48. Linear probing suffers from _____ and Quadratic probing suffers from _____ in hashing.

(A) Non-uniform clustering, collision

(B) Collision, non-uniform clustering

(C) Primary clustering, secondary clustering

(D) Secondary clustering, primary clustering

49. Which is the technique used for classification in data mining?

(A) Descriptive pattern

(B) Association rule

(C) Backpropogation algorithm

(D) Regression

50. _____ and _____ are the two measures of the effectiveness of an information retrieval system.

(A) Precision and Confidence

(B) Confidence and Support

(C) Web Crawler and Spider

(D) Precision and Recall

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