Roll No. ☐☐☐☐☐☐☐

(Write Roll Number from left side
exactly as in the Admit Card)

2217

Subject Code : 22

Signature of Invigilators

1. _____

2. _____

Question Booklet Series ☒ **X**

PAPER–II   **Question Booklet No.**

(Identical with OMR
Answer Sheet Number)

COMPUTER SCIENCE & APPLICATION

Time : 1 Hour 15 Minutes   *Maximum Marks: 100*

Instructions for the Candidates

1. Write your Roll Number in the space provided on the top of this page as well as on the OMR Sheet provided.

2. At the commencement of the examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and verify it:

   (i) To have access to the Question Booklet, tear off the paper seal on the edge of this cover page.

   (ii) Faulty booklet, if detected, should be get replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.

   (iii) Verify whether the Question Booklet No. is identical with OMR Answer Sheet No.; if not, the full set to be replaced.

   (iv) After this verification is over, the Question Booklet Series and Question Booklet Number should be entered on the OMR Sheet.

3. This paper consists of fifty (50) multiple-choice type questions. All the questions are compulsory. Each question carries *two* marks.

4. Each Question has four alternative responses marked: Ⓐ Ⓑ Ⓒ Ⓓ. You have to darken the circle as indicated below on the correct response against each question.

   Example: Ⓐ Ⓑ ● Ⓓ, where Ⓒ is the correct response.

5. Your responses to the questions are to be indicated correctly in the OMR Sheet. If you mark your response at any place other than in the circle in the OMR Sheet, it will not be evaluated.

6. Rough work is to be done at the end of this booklet.

7. If you write your Name, Roll Number, Phone Number or put any mark on any part of the OMR Sheet, except the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, such as change of response by scratching or using white fluid, you will render yourself liable to disqualification.

8. Do not tamper or fold the OMR Sheet in any way. If you do so, your OMR Sheet will not be evaluated.

9. You have to return the Original OMR Sheet to the invigilator at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are, however, allowed to carry question booklet and duplicate copy of OMR Sheet after completion of examination.

10. **Use only Black Ball point pen.**

11. **Use of any calculator or mobile phone etc. is strictly prohibited.**

12. **There are no negative marks for incorrect answers.**

[Please Turn Over]

COMPUTER SCIENCE & APPLICATION

PAPER II

1. P = {try, not, union}

Q = { and, bitand, complex}

X = {auto, goto, if}

Z = {int, void, not}

Which one is correct?

   (A) Elements in P are C++ keywords.

   (B) Elements in Q are C++ keywords.

   (C) Elements in X are C keywords only, but those in Z are not.

   (D) Elements in X and also in Z are C keywords.

2. For a DBMS to be used, it must minimally support

   (i) SELECT, UNION, INTERSECT

   (ii) SELECT, UNION, JOIN

   (iii) SELECT, PROJECT, JOIN

   (iv) SELECT, PROJECT, UNION

Which one is correct?

   (A) (iv)

   (B) (iii)

   (C) (ii)

   (D) (i)

3. Consider

$$L_1 = \left\{ PP^R \,/\, P \in \{0, 1\}^* \right\}$$

$$L_2 = \left\{ 0^n 1^n \,/\, n \geq 1 \right\}$$

$$L_3 = \left\{ PP \,/\, P \in \{0, 1\}^* \right\}$$

$$L_4 = \left\{ a^n b^m c^m d^n \,/\, n, m \geq 0 \right\}$$

and machines M_1, M_2, M_3, M_4 recognizing the Languages L_1, L_2, L_3, L_4 respectively. Which one is correct?

   (A) M_1 and M_2 are PDAs, but M_3 and M_4 are not.

   (B) M_2 and M_3 are PDAs, but M_1 and M_4 are not.

   (C) All of M_1, M_2, M_3 and M_4 are PDAs.

   (D) L_1, L_2, L_4 are PDAs.

4. Consider X as a n bit number which is a power (k) of 2. Then sum of X and $X - 1$ contain j zeros where,

   (A) $j = n - k - 1$

   (B) $j = n - k$

   (C) $j = n - k + 1$

   (D) $j = 0$

5. Consider the following Trees:
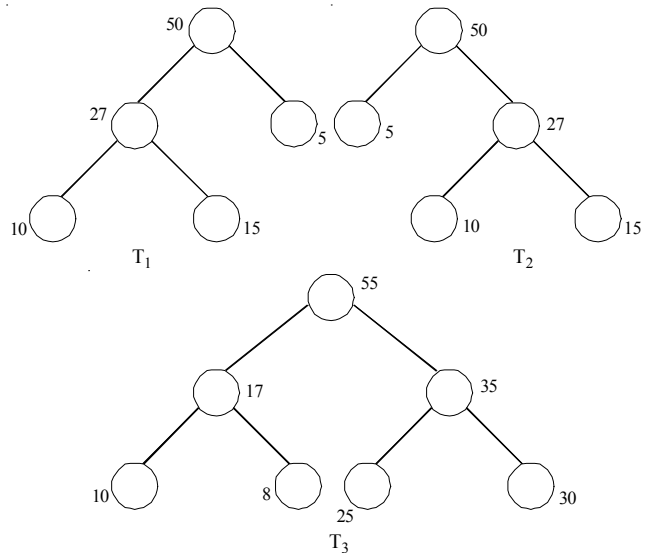
Which one is correct?

   (A) T_1, T_2, T_3 are heaps.

   (B) T_2, T_3 are heaps.

   (C) T_1 is a heap, but not T_2 and T_3.

   (D) T_1, T_3 are heaps.

6. In mixed-mode arithmetic operation, an integer is converted to floating-point form in the following phase of a typical compiler:

   (A) Lexical analysis

   (B) Parsing

   (C) Semantic analysis

   (D) Intermediate code generation

7. Front end of a typical compiler is constituted with

   (A) Lexical, Syntax and Semantic analysis phases.

   (B) Lexical, Semantic and Code generation phases.

   (C) Intermediate code generation, code optimization and code generation phases.

   (D) Syntax, Semantic and Code optimization phases.

8. Limitations of Banker's algorithm of resource distribution are as follows:

   (A) It can handle more than two processes.

   (B) The number of resources are static.

   (C) The number of processes are static.

   (D) Both (B) and (C)

9. Parallelism is related to

   (A) Pipelining

   (B) Multiple-Processor systems

   (C) Vector computers

   (D) All of the above

10. One of the following is not related to www:

   (A) HTML

   (B) URL

   (C) UML

   (D) HTTP

11. Floating-point multiplication requires

   (A) a fixed-point multiplication of the mantissa and a fixed-point addition of the exponent.

   (B) a fixed-point multiplication of the mantissa and floating-point addition of the exponent.

   (C) a floating-point multiplication of the mantissa and fixed-point addition of the exponent.

   (D) a floating-point multiplication of the mantissa and a floating-point addition of the exponent.

12. In a JK Flip-flop, toggle means

   (A) No change of output.

   (B) Set Q = 1 and Q = 0

   (C) Set Q = 0 and Q = 1

   (D) Changing the output to the opposite state.

13. In C, arguments are passed to functions by

   (A) value

   (B) reference

   (C) value-result

   (D) Both (A) and (B)

14. The following statements are given:

   (A) BCNF is also in 3 NF.

   (B) 3 NF is not necessarily in BCNF.

   (C) BCNF is stronger than 3 NF.

   (D) 3 NF must be in BCNF.

Find out the false one.

15. In a B+ tree

(A) Data pointers can be stored at any level of the tree.

(B) Data pointers can be stored only at the leaf nodes of a tree.

(C) The searching time is same for any key.

(D) The leaf nodes contain the search field and data pointer.

Find out the incorrect one.

16. Which one of the following is not related to Mobile IP?

(A) 2X

(B) Triangle routing

(C) Dog-Leg routing

(D) Peer to Peer

17. SSL is designed to provide

(A) security and compression services to data generated from application layer.

(B) security and compression services to data generated from network layer.

(C) security and compression to data generated from physical layer.

(D) security and compression to data generated from transport layer.

18. Data mining is related to

(A) Knowledge Discovery

(B) Classification

(C) Clustering

(D) All of the above

19. How many Hamiltonian circuits are there in a complete graph with *n* vertices?

(A) $\dfrac{n-1}{2}$

(B) $\lfloor n-1 \rfloor$

(C) $\lfloor n \rfloor$

(D) $\dfrac{\lfloor n-1 \rfloor}{2}$

20. Bipolar RAM usually makes use of

(A) TTL high speed circuit

(B) DTL circuit

(C) RTL high speed circuit

(D) None of the above

21. Which of the following is the process by which a user's privileges are ascertained?

(A) Authorization

(B) Authentication

(C) Access Control

(D) None of the above

22. Linked lists are not suitable data structures for which of the following problems?

(A) Insertion sort

(B) Polynomial multiplication

(C) Radix sort

(D) Binary search

23. Consider a hashing function that resolves collision by quadratic probing. Assume the address space is indexed from 1 to 8. Which of the following locations will never be probed if a collision occurs at position 4?

    (A) 4

    (B) 5

    (C) 7

    (D) 2

24. Which of the protocols uses both TCP and UDP?

    (A) FTP

    (B) SMTP

    (C) Telnet

    (D) DNS

25. When you issue ping command, what protocol are you using?

    (A) DNS

    (B) DHCP

    (C) ICMP

    (D) ARP

26. Shadow paging technique maintains

    (A) two-page tables

    (B) three-page tables

    (C) four-page tables

    (D) five-page tables

27. Round Robin scheduling behaves like FCFS scheduling when

    (A) the time slice is less than the average CPU burst.

    (B) the time slice is less than the smallest CPU burst.

    (C) the time slice is greater than the average CPU burst.

    (D) the time slice is greater than the largest CPU burst.

28. Verification and Validation are components of

    (A) Software Documentation

    (B) Total Quality Management

    (C) Software Quality Assurance

    (D) Testing

29. The number of binary relations on a set with p elements is

    (A) p^2

    (B) 2^p

    (C) 2^{p^2}

    (D) 2^{p^3}

30. Let A and B be sets with number of elements a and b respectively. Then for $a < b$, the number of one-to-one mappings from A to B is

    (A) a^b

    (B) a_{P_b}

    (C) a_{C_b}

    (D) b_{P_a}

31. Which of the following statements is not true?

(A) A tree with n vertices has $(n - 1)$ edges.

(B) Any connected graph with n vertices and $(n - 1)$ edges is a tree.

(C) A tree with n vertices has n edges.

(D) A graph is a tree if and only if it is minimally connected.

32. Average-case complexity of sequential search if the element that is searched is not in the list is

(A) $n\left(1 - \dfrac{p}{2}\right) + \dfrac{p}{2}$

(B) $n\left(1 + \dfrac{p}{2}\right) + \dfrac{p}{2}$

(C) $\dfrac{n + p}{2}$

(D) $\dfrac{pn + 1}{2}$

33. Which of the following statements do not satisfy the principles of structured programming?

(A) The use of loop statements

(B) The use of go to statements

(C) The use of sequential program statements

(D) The use of if then else statements

34. A Base Class is inherited by

(A) a Derived Class

(B) Inline function

(C) Constructor

(D) None of the above

35. The operation of a relation X, produces Y such that Y contains only selected attributes of X. Such an operation is

(A) Projection

(B) Intersection

(C) Union

(D) Difference

36. 2 NF is based on

(A) Partial dependency

(B) Transitive dependency

(C) Full functional dependency

(D) Non-trivial functional dependency

37. Which of the following traversal techniques lists the nodes of Binary Search Tree in ascending order?

(A) Postorder

(B) Inorder

(C) Preorder

(D) None of the above

38. Telephone network works in

(A) Simplex mode transmission

(B) Half-duplex mode transmission

(C) Full-duplex mode transmission

(D) Arbitrary mode transmission

39. In TCP/IP protocol suite, layers are arranged from bottom to up as follows:

(A) Physical, Data link, Application, Transport, Network

(B) Physical, Network, Data link, Transport, Application

(C) Physical, Data link, Network, Transport, Application

(D) Physical, Transport, Network, Data link, Application

40. Tokens are identified during

(A) Lexical Analysis

(B) Syntax Analysis

(C) Semantic Analysis

(D) Code optimization

41. In function point analysis, number of complexity adjustment factors are

(A) 10

(B) 20

(C) 14

(D) 12

42. Cyclomatic complexity is given by

(A) V(G) = E – N + 2

(B) V(G) = P + 1

(C) The number of regions

(D) All of the above

43. The UNIX command "*cat abc def > xyz*"

(A) tests whether the variables *abc* and *def* are both greater than *xyz*.

(B) merges two files *abc* and *def* with all values greater than *xyz*.

(C) merges the two files *abc* and *def* and stores it in *xyz*.

(D) is syntactically not correct.

44. If the base register holds 300040 and the limit register is 120900, then the program can legally access

(A) all addresses from 300040 through 420939 (inclusive).

(B) all addresses from 300041 through 420940.

(C) all addresses from 300039 through 420939 (inclusive).

(D) all addresses from 300039 through 420940.

45. For the following grammar:

$S \rightarrow A \,/\, B$

$A \rightarrow C \, A + b \,/\, a$

$B \rightarrow C \, B + a \,/\, b$

$\text{First}\,(A) \cap \text{First}\,(B)$ is

(A) *a*

(B) *b*

(C) *ab*

(D) *c*

46. For $\sum = \{0,1\}$, the regular expression

$0 * 10 * 10 * 10$ denotes

(A) all the binary strings possessing exactly three 1's.

(B) all the nonempty binary strings.

(C) all the binary strings including empty string.

(D) all the binary strings possessing more than two 1's.

47. Mutation testing is related to

(A) Fault seeding

(B) Functional testing

(C) Genetic algorithm

(D) Fault cracking

48. Program volume of a software product is

(A) $V = N \log_2 n$

(B) $V = (N/2) \log_2 n$

(C) $V = 2N \log_2 n$

(D) $V = N \log_2 n + 1$

49. The general Caesar Cipher Substitution function for encryption is given by

(A) $C = (p + k) \bmod 26$

(B) $C = p \bmod 26$

(C) $C = k \bmod 26$

(D) $C = (p - k) \bmod 26$

where p is plaintext letter and k takes on a value in the range 1 to 25.

50. The nearest value of $(113)_{16} \times (3 \cdot 6)_8$ is

(A) $(11010 \cdot 1)_2$

(B) $(1030 \cdot 2)_{10}$

(C) $(111 \cdot 8)_{16}$

(D) $(467 \cdot 4)_8$

———————

ROUGH WORK

ROUGH WORK

ROUGH WORK