Test Paper : **II**

Test Subject : **COMPUTER SCIENCE AND APPLICATIONS**

Test Subject Code : **A-04-02**

Test Booklet Serial No. : _____

OMR Sheet No. : _____

Hall Ticket No. | | | | | | | | | |

(Figures as per admission card)

Name & Signature of Invigilator

Name : _____ Signature : _____

Paper : II

Subject : COMPUTER SCIENCE AND APPLICATIONS

Time : 1 Hour 15 Minutes Maximum Marks : 100

Number of Pages in this Booklet : 16 Number of Questions in this Booklet : **50**

Instructions for the Candidates

1. Write your Hall Ticket Number in the space provided on the top of this page.
2. This paper consists of fifty multiple-choice type of questions.
3. At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below :
   (i) To have access to the Question Booklet, tear off the paper seal on the edge of this cover page. Do not accept a booklet without sticker-seal and do not accept an open booklet.
   (ii) **Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got 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) After this verification is over, the Test Booklet Number should be entered in the OMR Sheet and the OMR Sheet Number should be entered on this Test Booklet.
4. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.
   Example: (A) (B) ● (D)
   where (C) is the correct response.
5. Your responses to the items are to be indicated in the **OMR Sheet given to you**. If you mark at any place other than in the circle in the Answer Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
8. If you write your name or put any mark on any part of the OMR Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, you will render yourself liable to disqualification.
9. You have to return the test question booklet and OMR Answer Sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall.
10. **Use only Blue/Black Ball point pen.**
11. **Use of any calculator or log table etc., is prohibited.**
12. **There is no negative marks for incorrect answers.**

అభ్యర్థులకు సూచనలు

1. ఈ పుట పై భాగంలో ఇవ్వబడిన స్థలంలో మీ హాల్ టికెట్ నంబరు రాయండి.
2. ఈ ప్రశ్న పత్రము యాభై బహుళైచ్ఛిక ప్రశ్నలను కలిగి ఉంది.
3. పరీక్ష ప్రారంభమున ఈ ప్రశ్నాపత్రము మీకు ఇవ్వబడుతుంది. మొదటి ఐదు నిమిషములలో **ఈ ప్రశ్నాపత్రమును తెరిచి కింద తెలిపిన అంశాలను తప్పనిసరిగా సరిచూసుకోండి.**
   (i) ఈ ప్రశ్న పత్రమును చూడడానికి కవర్‌పేజి అంచున ఉన్న కాగితపు సీలును చించండి. స్టిక్కర్ సీలులేని మరియు ఇదివరకే తెరిచి ఉన్న ప్రశ్నాపత్రమును మీరు అంగీకరించవద్దు.
   (ii) **కవరు పేజి పై ముద్రించిన సమాచారం ప్రకారం ఈ ప్రశ్నపత్రములోని పేజీల సంఖ్యను మరియు ప్రశ్నల సంఖ్యను సరిచూసుకోండి. పేజీల సంఖ్యకు సంబంధించి గానీ లేదా సూచించిన సంఖ్యలో ప్రశ్నలు లేకపోవుట లేదా నిజప్రతి కాకపోవుట లేదా ప్రశ్నలు క్రమపద్ధతిలో లేకపోవుట లేదా ఏవైనా తేడాలుండుట వంటి దోషపూరితమైన ప్రశ్న పత్రాన్ని పెంటనే మొదటి ఐదు నిమిషాల్లో పరీక్షా పర్యవేక్షకునికి తిరిగి ఇచ్చివేసి దానికి బదులుగా సరిగ్గా ఉన్న ప్రశ్నపత్రాన్ని తీసుకోండి. తదనంతరం ప్రశ్నపత్రము మార్చబడదు అదనపు సమయం ఇవ్వబడదు.**
   (iii) పై విధంగా సరిచూసుకొన్న తర్వాత ప్రశ్నాపత్రం సంఖ్యను OMR పత్రము పై అదేవిధంగా OMR పత్రము సంఖ్యను ఈ ప్రశ్నాపత్రము పై నిర్దిష్టస్థలంలో రాయవలెను.
4. ప్రతి ప్రశ్నకు నాలుగు ప్రత్యామ్నాయ ప్రతిస్పందనలు (A), (B), (C) మరియు (D) లుగా ఇవ్వబడ్డాయి. ప్రతిప్రశ్నకు సరైన ప్రతిస్పందనను ఎన్నుకొని కింద తెలిపిన విధంగా OMR పత్రములో ప్రతి ప్రశ్న సంఖ్యకు ఇవ్వబడిన నాలుగు వృత్తాల్లో సరైన ప్రతిస్పందనను సూచించే వృత్తాన్ని బాల్ పాయింట్ పెన్‌తో కింద తెలిపిన విధంగా పూరించాలి.
   ఉదాహరణ : (A) (B) ● (D)
   (C) సరైన ప్రతిస్పందన అయితే
5. ప్రశ్నలకు ప్రతిస్పందనలను ఈ ప్రశ్నపత్రముతో ఇవ్వబడిన OMR పత్రము పైన ఇవ్వబడిన వృత్తాల్లోనే పూరించి గుర్తించాలి. అలాకాక సమాధాన పత్రంపై వేరొక చోట గుర్తిస్తే మీ ప్రతిస్పందన మూల్యాంకనం చేయబడదు.
6. ప్రశ్న పత్రము లోపల ఇచ్చిన సూచనలను జాగ్రత్తగా చదవండి.
7. చిత్తుపనిని ప్రశ్నపత్రము చివర ఇచ్చిన ఖాళీస్థలములో చేయాలి.
8. OMR పత్రము పై నిర్ణీత స్థలంలో సూచించవలసిన వివరాలు తప్పించి ఇతర స్థలంలో మీ గుర్తింపును తెలిపే విధంగా మీ పేరు రాయడం గానీ లేదా ఇతర చిహ్నాలను పెట్టడం గానీ చేసినట్లయితే మీ అనర్హతకు మీరే బాధ్యులవుతారు.
9. పరీక్ష పూర్తయిన తర్వాత మీ ప్రశ్నపత్రాన్ని మరియు OMR పత్రాన్ని తప్పనిసరిగా పరీక్షపర్యవేక్షకుడికి ఇవ్వాలి. వాటిని పరీక్ష గది బయటకు తీసుకువెళ్లకూడదు.
10. **నీలి/నల్ల రంగు బాల్ పాయింట్ పెన్ మాత్రమే ఉపయోగించాలి.**
11. **లాగరిథమ్ టేబుల్స్, క్యాలిక్యులేటర్‌లు, ఎలక్ట్రానిక్ పరికరాలు మొదలగునవి పరీక్షగదిలో ఉపయోగించడం నిషేధం.**
12. **తప్పు సమాధానాలకు మార్కుల తగ్గింపు లేదు.**

COMPUTER SCIENCE AND APPLICATIONS

Paper – II

1. Function overloading is done at

(A) Compile time

(B) Run time

(C) Linking time

(D) Execution time

2. OLAP is an acronym for

(A) Online Analytical Project

(B) Online Analytical Processing

(C) Online Application Processing

(D) Online Application Project

3. Architectural design involves in SE

(A) E-R diagram

(B) Flow-chart

(C) Algorithm

(D) DFD

4. An EDP auditor must be an expert in

(A) Computerised Business Systems

(B) Computerised System Analysis

(C) Computerised Accounting Analysis

(D) Computerised Program Analysis

5. If no exception is thrown

(A) A catch block will cause an error

(B) The first catch block coded will execute

(C) The last catch block coded will execute

(D) All catch blocks coded will be bypassed

6. Consider the following pseudo-code :

```
IF ((A > B) AND (C > D)) THEN
  A = A + 1
  B = B + 1
ENDIF
```

The cyclomatic complexity of the pseudo-code is

(A) 2 (B) 3

(C) 4 (D) 5

7. Which of the following testing methods is normally used as the acceptance test for a software system ?

(A) Regression testing

(B) Integration testing

(C) Unit testing

(D) Functional testing

8. Match the following

I. The beginning of the function code	1. ( )
II. The preprocessor directive always starts with	2. &
III. The symbol for the address operator	3. {
IV. The name of a function always ends with	4. #

	I	II	III	IV
(A)	1	2	3	4
(B)	3	4	2	1
(C)	3	2	4	1
(D)	3	2	1	4

9. Match the following :

1. Data Link Layer	i. The lowest layer whose function is to activate, deactivate and maintain the circuit between DTE and DCE
2. Physical Layer	ii. Perform routing
3. Presentation Layer	iii. Detection and recovery of errors in the transmitted data
4. Network Layer	iv. Provides syntax for the data

(A) 1 – iii, 2 – i, 3 – iv, 4 – ii

(B) 1 – ii, 2 – i, 3 – iv, 4 – iii

(C) 1 – iv, 2 – i, 3 – ii, 4 – iii

(D) 1 – ii, 2 – i, 3 – iii, 4 – iv

10. Match the following :

I. 0 (log n)	1. Heap sort
II. 0 (n)	2. DFS
III. 0 (n log n)	3. Binary search
IV. 0 (n^2)	4. Bubble sort

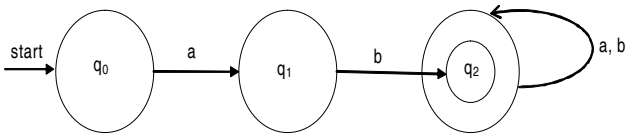
(A) I – 3, II – 2, III – 1, IV – 4

(B) I – 4, II – 1, III – 3, IV – 2

(C) I – 3, II – 1, III – 2, IV – 4

(D) I – 3, II – 2, III – 4, IV – 1

11. The string accepted by the following finite automaton



where a, b are alphabets, q_0, q_1, and q_2 are states and q_2 is final state

(A) abb*

(B) ab* (a + b)*

(C) ab (a + b)*

(D) (a + b)*

12. What is the maximum number of different Boolean functions involving n Boolean variables ?

(A) n^2 (B) 2^n

(C) 2^{2^n} (D) 2^{n^2}

13. Choose the category of following SQL operations INSERT, DELETE and UPDATE

(A) DDL (B) PL

(C) DML (D) DCL

14. Let G be a simple graph all of whose vertices have degree 3 and $|E| = 2|V| - 3$ what can be said about G ?

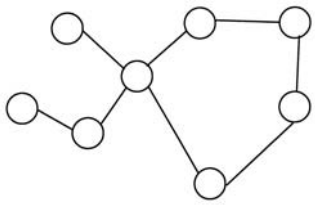
(A) G has '6' vertices and 9 edges

(B) G has 9 vertices and 6 edges

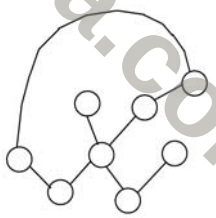
(C) G has 6 vertices and 12 edges

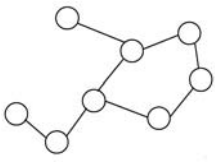
(D) None of the above

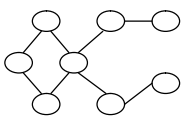
15. Which of the following graph is isomorphic to given below graph ?



(A) 

(B) 

(C) 

(D) 

16. Consider the join of a relation R with a relation S. If R has m tuples and S has n tuples, then the maximum and minimum sizes of the join respectively are

(A) m + n and 0

(B) mn and 0

(C) m + n and $|m - n|$

(D) mn and m + n

17. **Assertion A** : The technique of building new classes from the existing classes is called polymorphism.

Reason R : Polymorphism requires postponement of binding of a function call to the member function until runtime.

(A) Both (A) and (R) are true and (R) is the reason for (A)

(B) Both (A) and (R) are true but (R) is not a reason for (A)

(C) Only (A) is true and (R) is false

(D) Only (R) is true and (A) is false

18. Suppose a tree has d_1 vertices of degree 1, 2 vertices of degree 2, 4 vertices of degree 3 and 3 vertices of degree 4 then d_1 value is

(A) 6

(B) 4

(C) 8

(D) 12

19. A Binary Search Tree (BST) stores values on the range 37 to 573. Consider the following sequence of keys

i. 81, 537, 102, 439, 285, 376, 305

ii. 52, 97, 121, 195, 242, 381, 472

iii. 142, 248, 520, 386, 345, 270, 307

iv. 550, 149, 507, 395, 463, 402, 270

Which of the following statements is TRUE ?

(A) i, ii and iv are inorder sequences of three different BSTs

(B) i is a preorder sequence of some BST with 439 as the root

(C) ii is an inorder sequence of some BST where 121 is the root and 52 in a leaf

(D) iv is a post order sequence of some BST with 149 as the root

20. **Assertion A** : Implicit type conversion in C++ can lead to errors keeping into the program, if adequate care is not taken.

Reason R : Use of explicit type conversion is recommend in mixed mode expression.

(A) Both (A) and (R) are true and (R) is the reason for (A)

(B) Both (A) and (R) are true but (R) is not a reason for (A)

(C) Only (A) is true and (R) is false

(D) Only (R) is true and (A) is false

21. If X is a Boolean variable, then among following what are the statements true according to Idempotent law ?

I. $X + X = X$

II. $X . X = X$

III. $X . 1 = X$

IV. $X + 1 = 1$

(A) I and II are correct

(B) I and IV are correct

(C) II and III are correct

(D) All four (I, II, III and IV) are correct

22. Exterior Gateway Protocol is

(A) To exchange routing information between gateway hosts

(B) To connect two bridges

(C) Loop-free interdomain routing between autonomous systems

(D) To provide quality of service

23. Find the following statements in the context of software testing are TRUE or FALSE

S1 : Statement coverage cannot guarantee execution of loops in a program under test.

S2 : Use of independent path testing criterion guarantees execution of each loop in a program under test more than once.

(A) True, True

(B) True, False

(C) False, True

(D) False, False

24. Match the following :

I. To add 2 bits	1. Full adder
II. To add 3 bits	2. Left shift by 1 bit
III. To multiply by 2	3. Right shift by 1 bit
IV. To divide by 2	4. Half adder

	I	II	III	IV
(A)	3	1	4	2
(B)	4	1	2	3
(C)	4	1	3	2
(D)	1	4	2	3

25. A medium access control technique for multiple access transmission media is

(A) ALOHA

(B) AMPLITUDE

(C) ATTENUATION

(D) MODULATION

26. In a software project, COCOMO (Constructive Cost Model) is used to estimate

(A) Effort and duration based on the size of the software

(B) Size and duration based on the effort of the software

(C) Effort and cost based on the duration of the software

(D) Size, effort and duration based on the cost of the software

27. The gray code for decimal 7 is

(A) 0111

(B) 1011

(C) 0100

(D) 0101

28. Error detection at the data link level is achieved by

(A) Bit stuffing

(B) Cyclic redundancy codes

(C) Equalization

(D) Huffmann code

29. In Unix, the file descriptor returned by open system call is of type

(A) FILE

(B) Integer

(C) Char

(D) Structure

30. The string 1101 does not belong to the set represented by

(A) $110^{*}(0+1)$

(B) $(10)^{*}(01)^{*}(00+11)^{*}$

(C) $1(0+1)^{*}101$

(D) $1(10+01)^{*}(1+0)^{*}$

31. Which of the following tool is known as 'parser' generator ?

(A) LEX

(B) YAAC

(C) TEX

(D) EMACS

32. The task of the Lexical Analysis phase is

(A) To parse the source program into the basic elements or tokens of the language

(B) To build a literal table and an identifier table

(C) To build a uniform symbol table

(D) All of the above

33. Match the following :

I. The processes ID	1. grep		
II. Editor	2. ps		
III. Searching in files	3. cat		
IV. Printing a file	4. vi		

	I	II	III	IV
(A)	2	4	1	3
(B)	3	4	2	1
(C)	2	3	4	1
(D)	4	3	1	2

34. Consider this C code to swap two integers and these five statements :

```
void swap (int * px, int * py)
 {
   * px = *px – *py ;
   *py = *px + *py;
  *px = *py – *px;
   }
```

S1 : Will generate a compilation error

S2 : May generate a segmentation fault at runtime depending on the arguments passed

S3 : Correctly implement the swap procedure for all input pointers referring to integers stored in memory locations accessible to the process

S4 : Implements the swap procedure correctly for some but not all valid input pointers.

S5 : May add or subtract integers and pointers.

(A) S1

(B) S2 and S3

(C) S2 and S4

(D) S2 and S5

35. A compiler for a high level language that runs on one machine and produces code for a different machine is called

(A) Optimizing compiler

(B) Cross compiler

(C) One pass compiler

(D) Multi pass compiler

36. Match the following :

I. Deadlock avoidance	1. Shortest job first algorithm
II. CPU scheduling	2. LRU algorithm
III. Mutual exclusion	3. Banker's algorithm
IV. Page replacement	4. Peterson's algorithm

	I	II	III	IV
(A)	1	3	2	4
(B)	4	2	3	1
(C)	3	1	4	2
(D)	2	4	3	1

37. Match the following :

P. Regular expression	1. Syntax analysis
Q. Pushdown automata	2. Code generation
R. Dataflow analysis	3. Lexical analysis
S. Register allocation	4. Code optimization

(A) P – 4, Q – 1, R – 2, S – 3

(B) P – 3, Q – 1, R – 4, S – 2

(C) P – 3, Q – 4, R – 1, S – 2

(D) P – 2, Q – 1, R – 4, S – 3

38. Reasoning with uncertain knowledge can be dealt with

(A) Monotonic reasoning

(B) Simple reasoning

(C) Non-monotonic reasoning

(D) Complex reasoning

39. Which of the following eliminates transitive dependency ?

(A) 1NF (B) 2NF

(C) BCNF (D) None of the above

40. Electronic credit cards can be in

(A) Unencrypted form only

(B) Encrypted form only

(C) Both A and B

(D) None of the above

41. Consider the following two statements

i. A Hash function is an injective function which is often used for computing digital signature

ii. An encryption technique DES performs a permutation on the elements of its input alphabet

Which of the following is valid for the above two statements ?

(A) Both are false

(B) i True, ii false

(C) ii True, i false

(D) Both are true

42. Select A, B, C from loan table consisting of fields A, B, C, D, E, F

(A) π_{loan} (A, B, C)

(B) σ_{ABC} (loan)

(C) σ_{loan} (A, B, C)

(D) None of the above

43. The number of flipflops required in a decade counter is

(A) 3

(B) 10

(C) 5

(D) 4

44. Which of the following is a non-linear data structure ?

i. Stack ii. Queue

iii. Tree iv. Graph

v. Doubly linked list

(A) All of the above

(B) iii, iv and v

(C) iii and iv

(D) i, ii and v

45. Consider the following statements :

P : A page fault occurs when the required page is not available in the main memory.

Q : There exists a situation that, there is no space available in the main memory.

Which of the following is true ?'

(A) Both P and Q are true, and Q is also a reason for P

(B) Both P and Q are true, and Q is not reason for P

(C) P is false but Q is true

(D) Both P and Q are false

46. Which of the following propositions is a tautology ?

(A) $(p \vee q) \rightarrow p$

(B) $p \vee (q \rightarrow p)$

(C) $p \vee (p \rightarrow q)$

(D) $q \vee (p \rightarrow q)$

47. Fense Register is used for

(A) CPU protection

(B) File protection

(C) Memory protection

(D) I/O unit protection

48. SQL stands for

(A) Structured Query Language

(B) Sequential Query Language

(C) System Query Language

(D) Standard Query Language

49. Active X control can be added to a webpage by using

(A) ⟨OBJECT⟩ tag

(B) ⟨SCRIPT⟩ tag

(C) ⟨ACTIVE⟩ tag

(D) None of the above

50. Consider 4 processes P_1, P_2, P_3 and P_4

Process	Arrival time	Time units required
P_1	0	5
P_2	1	7
P_3	3	4
P_4	4	6

Find the completion order of the 4 processes if round robin policy applies (round robin with the quantum of 2 time units)

(A) $P_1 P_2 P_3 P_4$

(B) $P_4 P_3 P_2 P_1$

(C) $P_2 P_3 P_1 P_4$

(D) $P_3 P_1 P_4 P_2$

Space for Rough Work

Space for Rough Work

Space for Rough Work