

पुस्तिका में पृष्ठों की संख्या : 16
Number of Pages in Booklet : 16

प्रश्न-पत्र पुस्तिका संख्या /
Question Paper Booklet No.

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Paper - III

अधिकतम अंक : 200
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प्रश्न-पत्र पुस्तिका एवं उत्तर पत्रक के पेपर सील/पॉलिथीन बैग को खोलने पर परीक्षार्थी यह सुनिश्चित कर लें कि उसके प्रश्न-पत्र पुस्तिका पर वही प्रश्न-पत्र पुस्तिका संख्या अंकित है जो उत्तर पत्रक पर अंकित है। इसमें कोई भिन्नता हो तो परीक्षार्थी वीक्षक से दूसरा प्रश्न-पत्र प्राप्त कर लें। ऐसा सुनिश्चित करने की जिम्मेदारी अभ्यर्थी की होगी।

On opening the paper seal/polythene bag of the Question Paper Booklet the candidate should ensure that Question Paper Booklet No. of the Question Paper Booklet and Answer Sheet must be same. If there is any difference, candidate must obtain another Question Paper Booklet from Invigilator. Candidate himself shall be responsible for ensuring this.

परीक्षार्थियों के लिए निर्देश

- सभी प्रश्नों के उत्तर दीजिए।
- सभी प्रश्नों के अंक समान हैं।
- प्रत्येक प्रश्न का केवल एक ही उत्तर दीजिए।
- एक से अधिक उत्तर देने की दशा में प्रश्न के उत्तर को गलत माना जाएगा।
- प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं, जिन्हें क्रमशः 1, 2, 3, 4 अंकित किया गया है। अभ्यर्थी को सही उत्तर निर्दिष्ट करते हुए उनमें से केवल एक गोले अथवा बबल को उत्तर पत्रक पर नीले बॉल प्वाइंट पेन से गहरा करना है।
- OMR उत्तर पत्रक इस परीक्षा पुस्तिका के अन्दर रखा है। जब आपको परीक्षा पुस्तिका खोलने को कहा जाए, तो उत्तर-पत्रक निकाल कर ध्यान से केवल नीले बॉल पॉइंट पेन से विवरण भरें।
- प्रत्येक गलत उत्तर के लिए प्रश्न अंक का 1/3 भाग काटा जायेगा। गलत उत्तर से तात्पर्य अशुद्ध उत्तर अथवा किसी भी प्रश्न के एक से अधिक उत्तर से है। किसी भी प्रश्न से संबंधित गोले या बबल को खाली छोड़ना गलत उत्तर नहीं माना जायेगा।
- मोबाइल फोन अथवा इलेक्ट्रॉनिक यंत्र का परीक्षा हॉल में प्रयोग पूर्णतया वर्जित है। यदि किसी अभ्यर्थी के पास ऐसी कोई वर्जित सामग्री मिलती है तो उसके विरुद्ध आयोग द्वारा नियमानुसार कार्यवाही की जायेगी।
- कृपया अपना रोल नम्बर ओ.एम.आर. पत्रक पर सावधानीपूर्वक सही भरें। गलत अथवा अपूर्ण रोल नम्बर भरने पर 5 अंक कुल प्राप्तांकों में से काटे जा सकते हैं।

चेतावनी: अगर कोई अभ्यर्थी नकल करते पकड़ा जाता है या उसके पास से कोई अनधिकृत सामग्री पाई जाती है, तो उस अभ्यर्थी के विरुद्ध पुलिस में प्राथमिकी दर्ज कराते हुए विविध नियमों-प्रावधानों के तहत कार्यवाही की जाएगी। साथ ही विभाग ऐसे अभ्यर्थी को भविष्य में होने वाली विभाग की समस्त परीक्षाओं से विवर्जित कर सकता है।

INSTRUCTIONS FOR CANDIDATES

- Answer all questions.
- All questions carry equal marks.
- Only one answer is to be given for each question.
- If more than one answers are marked, it would be treated as wrong answer.
- Each question has four alternative responses marked serially as 1, 2, 3, 4. You have to darken only one circle or bubble indicating the correct answer on the Answer Sheet using BLUE BALL POINT PEN.
- The OMR Answer Sheet is inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars carefully with blue ball point pen only.
- 1/3 part of the mark(s) of each question will be deducted for each wrong answer. A wrong answer means an incorrect answer or more than one answers for any question. Leaving all the relevant circles or bubbles of any question blank will not be considered as wrong answer.
- Mobile Phone or any other electronic gadget in the examination hall is strictly prohibited. A candidate found with any of such objectionable material with him/her will be strictly dealt as per rules.
- Please correctly fill your Roll Number in O.M.R. Sheet. 5 Marks can be deducted for filling wrong or incomplete Roll Number.

Warning : If a candidate is found copying or if any unauthorized material is found in his/her possession, F.I.R. would be lodged against him/her in the Police Station and he/she would liable to be prosecuted. Department may also debar him/her permanently from all future examinations.

इस परीक्षा पुस्तिका को तब तक न खोलें जब तक कहा न जाए।

Do not open this Test Booklet until you are asked to do so.



1. Let a table R have three candidate keys A, B and (C, D). Which of the following must not be correct ?
 - (1) $A \rightarrow BC$ (2) $B \rightarrow AD$
 - (3) $C \rightarrow AB$ (4) $A \rightarrow D$

2. A relation is in which of the form if it is BCNF and also has no multivalued dependencies :
 - (1) Second normal form
 - (2) Third normal form
 - (3) Fourth normal form
 - (4) Domain normal form

3. In which normal form partial dependency removed ?
 - (1) First normal form
 - (2) Second normal form
 - (3) Third normal form
 - (4) BCNF

4. Which of the following creates a virtual relation for storing the query ?
 - (1) Function (2) View
 - (3) Procedure (4) None of these

5. Which of the join operations do not preserve non matched tuples ?
 - (1) Left Outer Join
 - (2) Right Outer Join
 - (3) Inner Join
 - (4) Full Outer Join

6. Which of the following is a procedural language ?
 - (1) tuple relational calculus
 - (2) domain relational calculus
 - (3) relational algebra
 - (4) None of these

7. The content of the data dictionary is
 - (1) DML Commands
 - (2) DDL Commands
 - (3) Indexes to user data
 - (4) Metadata

8. Consider the relations r1 (A, B, C), r2 (C, D, E) and r3 (E, F), with primary keys A, C and E, respectively, Assume that r1 has 50 tuples, r2 has 15 tuples, and r3 has 75 tuples. What is the size of $r1 \bowtie r2 \bowtie r3$?
 - (1) 56250 (2) 50
 - (3) 15 (4) 75

9. A B+ tree index is to be built on the attribute of the relation with length 8 bytes. The disk blocks are of size 512 bytes and index pointer is of size 4 bytes. What could be the optimal degree of the B+ tree ?
 - (1) 43 (2) 15
 - (3) 17 (4) 18

10. What is the constraint the leads to fifth normal form ?
 - (1) General Constraints
 - (2) Multivated dependencies
 - (3) Functional dependency
 - (4) Join Dependency

11. Which of the following is false about static member functions ?
 - (1) static member functions can access not static members of class.
 - (2) static member functions belong to class.
 - (3) static member functions cannot be called using class object.
 - (4) static member functions cannot be overloaded.

12. The algorithm design technique used in the Quick sort algorithm is

- (1) Dynamic programming
- (2) Backtracking
- (3) Divide and Conquer
- (4) Greedy Method

13. What will be output by the following code segment ?

```
int sum=0;
int count=5;
while(count>1)
{sum=sum+count;
count=count-2;
}
Printf("%d\n", sum);
```

- (1) 5
- (2) 6
- (3) 7
- (4) 8

14. What will be the time complexity of optimally calculating a^b ?

- (1) $O(b)$
- (2) $O(b/2)$
- (3) $O(\log b)$
- (4) $O(\sqrt{b})$

15. Which algorithm is used to find the minimal distance from one node to all other nodes in a weighted graph ?

- (1) Dijkstra's algorithm
- (2) Prim's algorithm
- (3) Kruskal's algorithm
- (4) All of these

16. Post-order traversal of a binary tree is {a, c, d, b, e} and pre-order traversal of the tree is {e, a, b, c, d}. What is the in-order traversal of the binary tree ?

- (1) {a, b, c, d, e}
- (2) {c, b, d, a, e}
- (3) {a, e, c, b, d}
- (4) {b, d, c, a, e}

17. An AVL tree is a height balanced binary search tree. Why do we need to balance the height of the AVL tree ?

- (1) it saves memory
- (2) it helps to avoid skew trees
- (3) it simplifies storage
- (4) it helps in faster memory access

18. A destructor can be

- (1) virtual
- (2) volatile
- (3) static
- (4) None of these

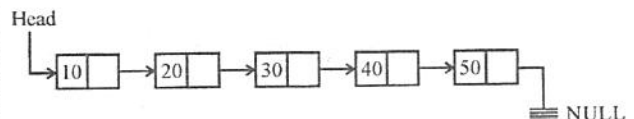
19. Can operator overloading change the operation performed by an operator ?

- (1) No
- (2) Yes
- (3) Conditionally
- (4) With restrictions

20. Object slicing can be resolved using

- (1) Pointer
- (2) References
- (3) Abstract class
- (4) All of these

21. Given a linked list L with head pointing to the first node of L, shown below :



What is the output when the following sequence of operations applied on the given list ?

P is a node pointer

- (i) $P = \text{head} \rightarrow \text{next} \rightarrow \text{next}$;
- (ii) $\text{head} \rightarrow \text{next} = P$;
- (iii) $\text{printf}(\text{"\%d"}, \text{head} \rightarrow \text{next} \rightarrow \text{next} \rightarrow \text{data})$;

- (1) 20
- (2) 30
- (3) 40
- (4) 50



22. The below code returns decimal value of binary linked list. Identify the code to be replaced with XYZ.

```
int val(struct Node *head)
{
    struct Node *p = head;
    int val2=0;
    while (p!= NULL)
    {
        XYZ;
        p = p->next;
    }
    return val2;
}
```

- (1) $val = (val \ll 1) + head \rightarrow data;$
 (2) $val = (val2 \ll 1) + p \rightarrow data;$
 (3) $val2 = (val2 \ll 1) + p \rightarrow data;$
 (4) $val2 = (val \ll 1) + head \rightarrow data;$

23. Consider inserting the keys 11, 23, 32, 5, 16, 29, 18, 89, 60 using open addressing technique into a hash table of length $m = 8$, with hash function $h(K) = K \bmod 8$. What is the number of collisions?

- (1) 5 (2) 3
 (3) 2 (4) 0

24. Input buffer is cleared and reset by _____ function of istream class.

- (1) `sync()` (2) `clear()`
 (3) `reset()` (4) None of these

25. Two matrices M1 and M2 are to be stored in arrays A and B respectively. Each array can be stored either in row-major or column-major order in contiguous memory locations. The time complexity of an algorithm to compute $M1 \times M2$ will be :

- (1) best if A is in row-major, and B is in column-major order
 (2) best if both are in row-major order
 (3) best if both are in column-major order
 (4) independent of the storage scheme

26. Which is true statement in the following?

- (1) Kruskal's algorithm is multiple source technique for finding MST.
 (2) Kruskal's algorithm is used to find minimum spanning tree of a graph, time complexity of this algorithm is $O(EV)$
 (3) Both Kruskal's algorithm is multiple source technique for finding MST and Kruskal's algorithm is used to find minimum spanning tree of a graph, time complexity of this algorithm is $O(EV)$
 (4) Kruskal's algorithm (choose best non-cycle edge) is better than Prim's (choose best Tree edge) when the graph has relatively few edges

27. The class NP is the set of all decision problems that :

- (1) Can be solved by polynomial-time algorithms.
 (2) Cannot be solved by polynomial-time algorithms.
 (3) Have polynomial-time algorithms. that can verify potential solutions.
 (4) All of these

28. Sequential search has a time complexity of $O(n)$, and binary search has a time complexity of $O(\log(n))$. What difference in worst case will it make when the size n is 1000 ?
- (1) You would not notice much difference because computers run very fast anyway
 - (2) As n is 1000, binary search is twice as fast as sequential search
 - (3) As n is 1000, binary search is 10 times as fast as sequential search
 - (4) As n is 1000, binary search is 100 times as fast as sequential search
29. In a graph if $e = [u, v]$, Then u and v are called
- (1) endpoints of e
 - (2) adjacent nodes
 - (3) neighbours
 - (4) All of these
30. In symmetric key cryptography, for encrypting and decrypting the message, the key is
- (1) private
 - (2) public
 - (3) different
 - (4) same
31. In selective repeat, the size of the sender and receiver window should be at most (if m is the size of sequence numbers fields in bits) :
- (1) 2^m
 - (2) 2^{m-1}
 - (3) 2^{2m}
 - (4) 2^{2m-1}
32. If network part of Class B address would have used 21 bits instead of 16 bits. How many class B networks would have been possible ?
- (1) 2^{21}
 - (2) 2^{16}
 - (3) 2^{19}
 - (4) 2^{23}

33. In the slow start phase of the TCP congestion control algorithm, the size of the congestion window
- (1) does not increase
 - (2) increases linearly
 - (3) increases quadratically
 - (4) increase exponentially
34. Encryption and decryption provide secrecy, or confidentiality, but not
- (1) Authentication
 - (2) Integrity
 - (3) Frames
 - (4) All of these
35. In the TCP/IP Protocol suite which one of the following is NOT part of the IP header ?
- (1) Fragment Offset
 - (2) Source IP address
 - (3) Destination IP address
 - (4) Destination port number
36. Match the following : OSI Layer Responsibilities
- | | |
|-----------------------|--------------------------------|
| 1. Network layer | p. Encoding & Translation |
| 2. Transport layer | q. Feedback Messaging |
| 3. Data Link layer | r. Transmission modes |
| 4. Session layer | s. Segmentation and Reassembly |
| 5. Presentation layer | t. Dialogue control |
| 6. Physical layer | u. Access Control |
- (1) 1-s, 2-t, 3-u, 4-r, 5-p, 6-q
 - (2) 1-q, 2-s, 3-u, 4-t, 5-p, 6-r
 - (3) 1-s, 2-u, 3-p, 4-r, 5-q, 6-t
 - (4) 1-q, 2-u, 3-p, 4-t, 5-s, 6-r

37. DES and public key algorithm are combined
- (i) to speed up encrypted message transmission
 - (ii) to ensure higher security by using different key for each transmission
 - (iii) as a combination is always better than individual system
 - (iv) as it is required in e-Commerce
- (1) (i) and (ii) (2) (ii) and (iii)
 (3) (iii) and (iv) (4) (i) and (iv)
38. Which one of the following routing algorithms can be used for network layer design ?
- (1) shortest path algorithm
 - (2) distance vector routing
 - (3) link state routing
 - (4) all of the mentioned
39. Which of the following devices runs all seven layers of the OSI model reference ?
- (1) Router and Gateway
 - (2) Bridge
 - (3) Repeater
 - (4) Hub
40. Shift reduce parsers are
- (1) Bottom Up parser
 - (2) Top down Parser
 - (3) May be Bottom up or Top down
 - (4) None of the mentioned
41. A language is regular if and only if
- (1) Accepted by Pushdown Automata
 - (2) Accepted by Non-deterministic finite Automata
 - (3) Accepted by Deterministic finite Automata
 - (4) Accepted by Turing machine
42. If L_1, L_2 are regular and $op(L_1, L_2)$ is also regular, then L_1 and L_2 are said to be _____ under an operation op .
- (1) Open
 - (2) Closed
 - (3) Decidable
 - (4) None of the mentioned
43. Which normal form amongst the following does not have left recursions ?
- (1) Greibach Normal Form (GNF)
 - (2) Chomsky Normal Form (CNF)
 - (3) Backus Naur Form (BNF)
 - (4) None of these
44. Which of the regular expressions corresponds to this grammar ?
 $S \rightarrow AB/AS, A \rightarrow a/aA, B \rightarrow b$
- (1) aa^*b^+ (2) aa^*b
 - (3) a^*b^* (4) $a(ab)^*$
45. Output of a lexical analyzer is :
- (1) Parse tree
 - (2) List of tokens
 - (3) Intermediate code
 - (4) Machine code

46. Which one of the following is a top-down parser ?

- (1) Recursive descent parser
- (2) Operator precedence parser
- (3) An LR(k) parser
- (4) An LALR(k) parser

47. Consider the following statements regarding deterministic PDA (DPDA) and nondeterministic PDA (NPDA).

S1 : In both DPDA and NPDA, dead configuration is allowed.

S2 : In NPDA, two transitions can have same constraints.

S3 : Number of states in DPDA \leq NPDA

Which option is correct ?

- (1) Only S1 and S3
- (2) Only S3
- (3) All are true
- (4) Only S1 and S2

48. Identify the correct statement when LR parsers are compared using any particular grammar.

- (1) If LR (0) has no conflict, then SLR (1) may have conflict.
- (2) If SLR (1) has no conflict, then LR (0) never contain any conflict
- (3) If LALR (1) has no conflict CLR (1) never contain any conflict
- (4) If CLR (1) has no conflict then LALR (1) may have conflict

49. Consider the following statements about the Turing machine :

- (i) It can be represented using instantaneous description
- (ii) In one move, the Turing machine can write a symbol on the cell being scanned
- (iii) It can be represented using transition table

Which of the above statement(s) is/are true ?

- (1) Only (ii)
- (2) (ii) and (iii)
- (3) (i), (ii) and (iii)
- (4) (i) and (iii)

50. The power set of infinite countable set is _____.

- (1) Countable
- (2) Not Countable
- (3) Sometimes Countable
- (4) None of these

51. Which one is informed search ?

- (1) Depth First Search
- (2) Breadth First Search
- (3) Bi-Directional Search
- (4) Heuristic Search

52. What is function for A* algorithm ?

- (1) $f(n) = h(n)$
- (2) $f(n) = h(n) + g(n)$
- (3) $f(n) \neq h(n)$
- (4) $f(n) \leq h(n)$

53. A compound proposition that is always true, no matter what the truth values of the propositional variable that is called

- (1) Tautology
- (2) Contradiction
- (3) Contingency
- (4) None of these

54. Give the predicate logic statement for :
"Wonder is a name of a dog"

- (1) dog-wonder (2) dog (wonder)
(3) wonder (dog)b (4) wonder-dog

55. Methods are specified in the language by :

- (1) Syntax (2) Semantics
(3) Inference (4) None

56. Which search is similar to minimax search ?

- (1) Hill-climbing search
(2) Depth-first search
(3) Breadth-first search
(4) All of these

57. What is an example for blind search ?

- (1) Bidirectional Search
(2) Depth-Limited Search
(3) Uniform Cost Search
(4) All of these

58. What is the Nature of Satisfiability (SAT) problem ?

- (1) NP – Hard
(2) NP
(3) P
(4) NP – Complete

59. Here are two sentences in the language of first-order logic :

$$A : \forall x \exists y (x \geq y)$$

$$B : \exists y \forall x (x \geq y) \quad x, y \text{ over natural numbers } 0, 1, 2, \dots, \infty$$

- (i) A is true
(ii) B is not true
(iii) A logically entails B
(iv) B logically doesn't entail A

Which of the above statement are true ?

- (1) (i) and (ii) (2) (ii) and (iii)
(3) (i) and (iii) (4) Only (i)

60. What is the worst-case time complexity of BFS to find the node at depth d on a uniform tree with n successors to each node except leaf nodes ?

- (1) $O(n^n)$ (2) $O(n^d)$
(3) $O(d^n)$ (4) $\theta(d^n)$

61. The operating system keeps the information of files in a table called

- (1) File Folder Table (FFT)
(2) File Index Table (FIT)
(3) File Number Table (FNT)
(4) File Allocation Table (FAT)

62. When a thread waits indefinitely for some resource, but other threads are actually using it is called

- (1) Segmentation (2) Demand Paging
(3) Starvation (4) All of them

63. What hole will allocate in "Worst-Fit" algorithm of memory management ?

- (1) It allocates the smaller hole than required memory hole
- (2) It allocates the smallest hole from the available memory holes
- (3) It allocates the exact same size memory hole
- (4) It allocates the largest hole from the available memory holes

64. Which of the following is advantage of virtual memory ?

- (1) Faster access to memory on an average.
- (2) Processes can be given protected address spaces.
- (3) Linker can assign addresses independent of where the program will be loaded in physical memory
- (4) Programs larger than the physical memory size can be run

65. In which one of the following page replacement policies, Belady's anomaly may occur ?

- (1) FIFO
- (2) Optimal
- (3) LRU
- (4) MRU

66. Metadata contains atleast :

- (1) the structure of the data.
- (2) the algorithms used for summarization
- (3) the mapping from the operational environment to the data warehouse.
- (4) All of these

67. Consider the following four processes, with the length of CPU Burst time in milliseconds :

Process	Arrival Time	Burst Time
P1	0	8 4 2
P2	1	4 0
P3	2	9 8 3
P4	3	5

Using the Round Robin scheduling algorithm, when time quantum is 2 units, the Average Waiting Time is :

- (1) 12.15
- (2) 11.75
- (3) 12.50
- (4) None

68. In which of the following states, process will be in secondary memory ?

- (1) New, Ready, Wait/Block
- (2) New, Wait/Block, Suspend Wait, Suspend Ready
- (3) Wait/Block, Suspend Wait, Suspend Ready
- (4) New, Suspend Wait, Suspend Ready

69. Which of the following changes permission to deny write permission to group and others ?

- (1) Chmod go - w filex
- (2) Chmod go w filex
- (3) Chmod go = w filex
- (4) None of these

70. Indicate which commands are syntactically correct

- (i) ls-l-d a*b*
 - (ii) ls-l-d a*b*
 - (iii) ls-l-d a*b*
 - (iv) ls-la* - d b*
- (1) (i) and (ii)
 - (2) (ii) and (iii)
 - (3) (i) and (iii)
 - (4) (ii) and (iv)

71. Which of the following are validation activities :
- (i) Code Review
 - (ii) Stress Testing
 - (iii) System Testing
 - (iv) Document Verification
 - (v) Boundary Value Testing
- (1) (i), (v) (2) (i), (iv)
(3) (ii), (iii), (v) (4) All of these
72. Fishbone Diagram is also known as
- (1) Pareto Diagram
 - (2) Scatter Plot Diagram
 - (3) Line Diagram
 - (4) Ishikawa Diagram
73. Which of the following cyclomatic complexity value range is preferred among the following :
- (1) 1 to 10 (2) 10 to 20
 - (3) 20 to 40 (4) Greater than 40
74. A Software Requirements Specification (SRS) document should avoid discussing which one of the following ?
- (1) User Interface issues
 - (2) Non-functional requirements
 - (3) Design specification
 - (4) Interfaces with third party software
75. Which one is not right in the reference of Black Box Testing ?
- (1) Internal workings of an application are not required.
 - (2) Also known as clear box/structural testing.
 - (3) This can only be done by trial and error method.
 - (4) Also known as closed box/data driven testing.
76. The final form of testing COTS software is ?
- (1) Unit (2) Integration
 - (3) Alpha (4) Beta
77. Match the following :
- | | | |
|--------------------|-------|---|
| A. Maintainability | (i) | Must be usable by the users for which it was designed |
| B. Dependability | (ii) | Ability to meet the changing needs of customers |
| C. Efficiency | (iii) | Optimal use of resources |
| D. Acceptability | (iv) | Ability to withstand the events of system failure |
- Matches :**
- | | A | B | C | D |
|-----|------|------|-------|-------|
| (1) | (ii) | (i) | (iv) | (iii) |
| (2) | (ii) | (iv) | (iii) | (i) |
| (3) | (i) | (iv) | (iii) | (ii) |
| (4) | (ii) | (i) | (iii) | (iv) |
78. The system design process does not include
- (1) modularity (2) cohesion
 - (3) coupling (4) None of these
79. COCOMO (CONstructive COSt MOdel) is used to estimate
- (1) effort and duration based on the size of the software
 - (2) size and duration based on the effort of the software
 - (3) effort and cost based on the duration of the software
 - (4) size, effort and duration based on the cost of the software

80. The ability of the system to handle incorrect inputs is called as

- (1) Accuracy (2) Reliability
 (3) Correctness (4) Robustness

81. Match the following :

List-I

List-II

- A. Version (i) An instance of a system which is distributed to users outside of the development team
- B. Release (ii) An instance of a system which is functionally identical but non-functionally distinct from other instances of a system.
- C. Variant (iii) An instance of a system which is functionally distinct in some way from other system instances

Matches :

- | | A | B | C |
|-----|-------|-------|-------|
| (1) | (ii) | (iii) | (i) |
| (2) | (ii) | (i) | (iii) |
| (3) | (iii) | (ii) | (i) |
| (4) | (iii) | (i) | (ii) |

82. Which transformation is used for undoing the applied transformation :

- (1) Reverse transformation
 (2) Rotation transformation
 (3) Reflection transformation
 (4) Inverse transformation

83. When 8-way symmetry is used to obtain a full circle from pixel coordinates generated for the 0 to 45 degree octant, some pixels are set or plotted twice. This phenomenon is sometimes referred to as :

- (1) Interlacing (2) Antialiasing
 (3) Overstrike (4) Aliasing

84. A cubic Bezier curve segment is described by control points P0(2, 2), P1(4, 8), P2(8, 8) and P3(9, 5). Another curve segment is described by Q0(a, b), Q1(c, 2), Q2(15, 2) and Q3(18, 2). Determine the values a, b and c so that the two curve segments join smoothly.

- (1) a = 9, b = 5 and c = 2
 (2) a = 5, b = 9 and c = 2
 (3) a = 2, b = 9 and c = 5
 (4) a = 2, b = 5 and c = 9

85. When the centre of projection is at infinity along the z direction and the plane of projection is the principle plane, it is called

- (1) perspective projection
 (2) oblique projection
 (3) orthographic projection
 (4) diametric projection

86. Which of the following is true for a DCT transform ?

- (1) As DCT is unitary transform, the energy is conserved
 (2) DCT has excellent energy compaction for highly correlated data
 (3) Cosine transform is not real part of unitary DCT
 (4) All of these



87. In image processing, Noise suppression operators are
- (1) Averaging functions
 - (2) Histogram functions
 - (3) Derivative functions
 - (4) Subtractive functions
88. If a histogram of the image is concentrated on the lower side of the gray scale, then the image is
- (1) Very Bright
 - (2) Very Dark
 - (3) Equallized
 - (4) White image
89. JPEG is an image compression standard developed by the
- (1) Joint Photo Editing Group
 - (2) Joint Photographic Experts Group
 - (3) Joint Photo Encapsulation Group
 - (4) Joint Photo Encoding Group
90. Consider a homogenous coordinate system with three coordinates x , y and z . All the points in the system with z coordinate zero are called as
- (1) Cartesian points
 - (2) Parallel points
 - (3) Origin points
 - (4) Points at infinity

91. Match the following :
- A. Cavalier Projection (i) Projection by aligning the projection plane so that it intersects each coordinate axis at the same distance from the origin.
- B. Cabinet Projection (ii) Projection of points along parallel lines that are not perpendicular to the projection plane.
- C. Isometric Projection (iii) All lines perpendicular to the viewing surface are projected at one-half their length.
- D. Oblique Projection (iv) All lines perpendicular to the projection plane are projected with no change in length.

Matches :

	A	B	C	D
(1)	(iv)	(iii)	(i)	(ii)
(2)	(ii)	(iii)	(i)	(iv)
(3)	(iv)	(iii)	(ii)	(i)
(4)	(i)	(ii)	(iii)	(iv)

92. Consider coordinates of clipping window : $x\text{-max} = 300$; $y\text{-max} = 200$; $x\text{-min} = 100$ and $y\text{-min} = 100$. What are the clipping points for the line joining (150, 150) and (400, 300) ?
- (1) (150, 150) and (233, 200)
 - (2) (170, 150) and (233, 200)
 - (3) (150, 150) and (250, 300)
 - (4) (150, 160) and (255, 150)

93. Which algorithm can be used to fill the interior parts of the curved objects ?
- Scan-line fill algorithm
 - Scan-line algorithm
 - Boundary-fill algorithm
 - Flood-fill algorithm
- (i), (iii) and (iv) only
 - (iii) and (iv) only
 - (i) and (iv) only
 - All of these
94. The boundary of an image represented by
- Quad Tree
 - Projections
 - Polygons
 - Chain codes
95. Which of the following is a video compression technique ?
- TIFF
 - JPEG
 - BMP
 - M-JPEG
96. The parameters of periodic noise are estimated by
- Inspecting the Fourier spectrum
 - Visual Analysis
 - Patches of the background intensity
 - All of these
97. Given an image of size 1024×1024 pixels and the size of each pixel is an 8-bit quality. It requires _____ of storage space if the image is not compressed.
- One Terabyte
 - One Megabyte
 - 8 Megabytes
 - 8 Terabytes

98. Which one is not the intensity transformation function ?
- Log Transformations
 - Image Negatives
 - Gamma Transformations
 - Translation Transformations
99. Most common entropy encoding techniques are :
- Differential coding and Huffman coding
 - Huffman coding and Arithmetic coding
 - Arithmetic coding and Differential coding
 - Differential coding and Vector coding
100. Which of the following are methods for supervised classification ?
- Decision tree, K-means
 - Naive Bayes, Decision tree
 - K-means Hierarchal
 - Hierarchal, Naive Bayes
101. A distance metric used in cluster analysis must have the following properties :
- Always positive
 - Distance from x to x is zero
 - Distance from x to y is same as y to x
 - All of these



102. Data scrubbing is defined as
- (1) a process to reject data from the data warehouse and to create the necessary indexes.
 - (2) a process to load the data in the data warehouse and to create the necessary indexes
 - (3) a process to upgrade the quality of data after it is moved into a data warehouse.
 - (4) a process to upgrade the quality of data before it is moved into a data warehouse.

103. Match the following :

- | | | |
|-------------------------|-------|--|
| A. Enterprise Warehouse | (i) | Collection of the information about different subjects |
| B. Data Mart | (ii) | Set of views over operational databases |
| C. Virtual Warehouse | (iii) | Data that is of value to a specific group of users |

- | | A | B | C |
|-----|-------|-------|-------|
| (1) | (i) | (ii) | (iii) |
| (2) | (iii) | (ii) | (i) |
| (3) | (iii) | (i) | (ii) |
| (4) | (i) | (iii) | (ii) |

104. Consider a data set D with n number of attributes and D number of training tuples. What is the worst-case complexity of growing a decision tree ?
- (1) $O(n \times D \times \log(D))$
 - (2) $O(\log(n) \times D)$
 - (3) $O(n \times \log(D))$
 - (4) $O(n \times D)$

105. Match the following :

- | | | |
|-------------------|-------|---------------------------------------|
| A. Classification | (i) | Prediction of categorical data |
| B. Regression | (ii) | Analysis of data objects |
| C. Clustering | (iii) | Identification of distribution trends |

- | | A | B | C |
|-----|-------|-------|-------|
| (1) | (i) | (ii) | (iii) |
| (2) | (ii) | (iii) | (i) |
| (3) | (iii) | (ii) | (i) |
| (4) | (i) | (iii) | (ii) |

106. Identify odd one out

- (1) K – Mean method
- (2) Self organising feature map method
- (3) K – nearest neighbour method
- (4) Agglomerative method

107. Which approach is used for data clustering ?

- (1) Single layer perception
- (2) Self-organisation map
- (3) Multilayer perception
- (4) Radial basis function

108. The data can be stored, retrieved and updated in :

- | | |
|----------|----------|
| (1) OLAP | (2) OLTP |
| (3) SMTP | (4) FTP |

109. Which of the following step is not involved in data mining ?

- (1) Knowledge extraction
- (2) Data archaeology
- (3) Data exploration
- (4) Data transformation

110. A Device driver is required by which of the following ?

- (1) Disk
- (2) Cache
- (3) RAM
- (4) Register

111. Consider a 4-way set associative cache consisting of 128 lines with a line size of 64 words. The CPU generates 20-bit address of a word in main memory. The number of bits in the TAG, LINE and WORD field are respectively.

- (1) 9, 6, 5
- (2) 7, 7, 6
- (3) 7, 5, 8
- (4) 9, 5, 6

112. Which algorithm is used to remove and place new contents into the cache ?

- (1) Renewal algorithm
- (2) Updation
- (3) Replacement algorithm
- (4) None of these

113. What is the product of maxterms for Boolean function $F = xy + x'z$?

- (1) $\pi(1, 2, 4, 7)$
- (2) $\pi(0, 2, 4, 6)$
- (3) $\pi(1, 3, 4, 6)$
- (4) $\pi(0, 2, 4, 5)$

114. Consider a multiplier circuit that multiplies a binary number represented by 4 bits by a number represented by 3 bits and produces a 7-bit result. How many AND gates and 4-bit adders are needed to design the circuit ?

- (1) 10 and 4
- (2) 12 and 3
- (3) 12 and 2
- (4) 9 and 3

115. A computer uses a memory unit with 256 K words of 32 bits each. A binary instruction code is stored in one word of memory. The instruction has four parts : an indirect bit, an opcode a register code part to specify one of 64 registers, and an address part. What is the size of opcode in number of bits ?

- (1) 6
- (2) 7
- (3) 8
- (4) 9

116. Which of the following is an instruction in pseudo code ?

- (1) BEGIN
- (2) END
- (3) Both BEGIN and END
- (4) None of these

117. What is the size of decoder to select row of the chip with size 128×8 RAM, each to address 2048 byte of memory ?

- (1) 4×16
- (2) 4×12
- (3) 6×12
- (4) 8×16

118. In vectored interrupt, branch address is supplied by

- (1) CPU
- (2) Peripheral interrupted
- (3) I/O Service routine
- (4) None of these

119. The register used by the CPU as working area is called

- (1) Program counter
- (2) Accumulator
- (3) Instruction register
- (4) Index register

120. SQL provides a number of special aggregate functions. Which of the following is not included in SQL ?

- (1) Count
- (2) Median
- (3) Min
- (4) Sum



रफ कार्य के लिए स्थान / SPACE FOR ROUGH WORK

