

PAPER - II (COMPUTER SCIENCE AND APPLICATION)

51. Which of the following is not an object Oriented Programming language ?

- (1) Pearl (2) Python (3) Small talk (4) SQL Plus

52. Shift-Reduce conflicts are resolved by :

- (1) Left recursion (2) Left factoring
(3) Ambiguity (4) Associativity and Precedence

53. A least integer n such that $f(x)$ is $O(x^n)$ for each of the following functions. Arrange following according to the value of n in increasing order :

- A. $f(x) = 3x^3 + (\log x)^4$ B. $f(x) = (x^5 + x^2 + 1)/(x^3 + 1)$
C. $f(x) = (x^3 + x^2 + 1)/(x^2 + 1)$ D. $f(x) = (x^2 + 5\log x)/(x^2 + 1)$

Choose the correct answer from the options given below :

- (1) D, C, A, B (2) D, C, B, A (3) B, C, A, D (4) B, A, C, D

54. Arrange the following so that they can be placed in perfect/appropriate order.

- A. Planning B. Construction
C. Modeling D. Communication
E. Deployment

Choose the correct answer from the options given below :

- (1) A, B, C, D, E (2) D, A, C, B, E (3) A, D, B, C, E (4) B, C, D, A, E

55. Match List-I with List-II :

List - I

- A. $A \rightarrow aB \mid a, a \in T, A, B \in V$
B. $A \rightarrow BC \mid a, a \in T, A, B, C \in V$
C. LL (1) grammar
D. Halting problem

List - II

- I. Recursive Descent Parser
II. Turing Machine
III. Choamsky Normal Form
IV. Finite Automate

Choose the correct answer from the options given below :

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

56. What is a perceptron in ANN ?

- (1) A double layer auto-associative neural network.
(2) A neural network that contains feedback.
(3) An auto-associative neural network.
(4) A single layer feed-forward neural network with pre-processing.

57. Arrange the following examples of Artificial Intelligence (AI) in the order of increasing complexity :
- Spam email detection using rule-based systems.
 - Handwritten digit recognition using shallow neural networks.
 - Image classification using convolutional neural networks.
 - Autonomous driving using reinforcement learning algorithms.

Choose the correct answer from the options given below :

- (1) A, B, C, D (2) B, A, C, D (3) A, B, D, C (4) B, C, A, D

58. Match List-I with List-II :

List - I

Line coding scheme

- NRZ-L
- 2 B1Q
- 4.D-PAM 5
- MLT-3

List - II

Bandwidth (average)

- $B = N/4$
- $B = N/8$
- $B = N/3$
- $B = N/2$

Choose the correct answer from the options given below :

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

59. The order of steps of Address Translation in Linux Virtual Memory Scheme will be :

- register
- offset
- Page directory
- Page table
- Page middle directory

Choose the correct answer from the options given below :

- (1) B, A, D, E, C (2) A, C, E, D, B (3) D, C, A, B, E (4) C, A, D, E, B

60. If $f(n) = 5f(n/2) + 3$ and $f(1) = 7$ is a recurrence relation where K is positive integer, then $f(2^K) =$

- (1) $5^K (31/4) - 3/4$ (2) $5^K (29/4)$
(3) $2^K (31/4) - 3/4$ (4) $2^K (29/4)$

61. The instruction LD ADR(X) which is equivalent to $AC \leftarrow M[ADR + XR]$ is in :

- Direct Addressing Mode
- Indirect Addressing Mode
- Index Addressing Mode
- Immediate Addressing Mode

62. For the following Parents in figure (1) and (2) :

Parent ₁	10110	010
Parent ₂	10101	111

figure (1)

Cross over points

Parent ₁	10110	111
Parent ₂	10101	010

figure (2)

Which is correct ?

- (1) figure (2) is the two point crossover of figure (1)
- (2) figure (2) is one point crossover of figure (1)
- (3) figure (2) is N point crossover of figure (1)
- (4) figure (2) is uniform crossover of figure (1)

63. The sequence of steps for a page replacement algorithm will be :

- A. find a frame that is not currently being used
- B. change the page table
- C. use freed frame
- D. no frame is free
- E. free a frame

Choose the correct answer from the options given below :

- (1) D, A, E, B, C (2) E, B, A, C, D (3) B, E, A, D, C (4) D, E, B, A, C

64. Match List - I with List - II. $f(n) = af(n/b) + g(n)$ is a divide-and-conquer recurrence relation for the Listed-I algorithms, match their recurrence in Listed-II.

List - I

Divide-and-conquer based algorithms

- A. Binary Search
- B. Find maximum and minimum of a sequence
- C. Merge Sort
- D. Fast Matrix Multiplication

List - II

Recurrence Relation

- I. $f(n) = 7f(n/2) + 15n^2/4$
- II. $f(n) = 2f(n/2) + n$
- III. $f(n) = 2f(n/2) + 2$
- IV. $f(n) = f(n/2) + 2$

Choose the correct answer from the options given below :

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

65. Which of the following control problem does not exist, when processes unaware of each other during interaction ?

- (1) Mutual exclusion ✓(2) Data coherence
(3) Starvation (4) Deadlock

66. The height of a binary search tree for the words banana, peach, apple, pear, coconut, mango and papaya using alphabetical order is :

- (1) 2 (2) 3 (3) 4 ✓(4) 5

67. Match List-I with List-II :

List - I

- A. Batch Multiprogramming
B. Time sharing
C. Monitor
D. Reentrant Procedures

List - II

- I. allows more efficient use of main memory
II. user no longer has direct access to the processor
III. Maximize processor use
IV. minimize response time

Choose the correct answer from the options given below :

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

68. Which of the following is the function of the semantic analysis phase of compilation process ?

- (1) Type conversion (2) Tokenization
(3) Loop optimization ✓(4) Data flow Analysis

69. For the regular languages and context free languages which is not correct ?

- A. both are closed under union operation
B. both are closed under concatenation operation
C. both are closed under intersection operation
D. both are closed under complementation operation
E. both are closed under kleen star operation

Choose the most appropriate answer from the options given below :

- (1) A and B Only ✓(2) B and C Only
(3) C and D Only (4) D and E only

70. Match List-I with List-II :

List - I	List - II
A. Back Tracking	I. Automata
B. Infinite languages with matching numbers	II. Undecidable Problem
C. Canonical LR Parser	III. Predictive Parser
D. Post Correspondence Problem	IV. Large number of states

Choose the correct answer from the options given below :

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

71. The output of the following C++ Program is :

```
#include <stdio.h>
int main (void)
{
    int x, *p;
    x = 30;
    p = x;
    printf ("%d", *p);
    return 0;
}
```

- (1) 30 (2) value of x (3) address of x (4) Error

72. Which of the following have truth values if universe of discourse consists of all integers ?

- A. $\forall n \exists m (n^2 < m)$ B. $\exists n \forall m (n < m^2)$
 C. $\exists n \exists m (n^2 + m^2 = 5)$ D. $\exists n \exists m (n^2 + m^2 = 6)$
 E. $\exists n \exists m (m + n = 4 \wedge n - m = 1)$

Choose the correct answer from the options given below :

- (1) A, B, C Only (2) B, C, E Only (3) C, D, E Only (4) B, D Only

73. Multiple Inheritance is permitted directly in.....

- A. C++ B. Java
 C. Python D. VB.NET
 E. BASIC

Choose the most appropriate answer from the options given below :

- (1) A and B Only (2) A and C Only (3) B and D Only (4) A, C and E Only

74. The ratio of error found before s/w delivery and to the total errors (before and after) is called :
- Accuracy
 - Specificity
 - Defect Removal efficiency
 - Through put

75. Match List-I with List-II :

List - I

- RAID level-2
- RAID level-3
- RAID level-4
- RAID level-6

List - II

- block-interleaved
- error-correcting-code
- reed-solomon codes
- bit-interleaved

Choose the correct answer from the options given below :

- A-I, B-III, C-IV, D-II
- A-II, B-IV, C-I, D-III
- A-IV, B-I, C-II, D-III
- A-II, B-III, C-IV, D-I

76. Which of the followings sequence $\{a_n\}$ are the solution of recurrence relation $a_n = 8a_{n-1} - 16a_{n-2}$?

- $a_n = 1$
- $a_n = 2^n$
- $a_n = 4^n$
- $a_n = n4^n$
- $a_n = (-4)^n$

Choose the most appropriate answer from the options given below :

- A, B, C Only
- B, C, D Only
- C, D Only
- C, D, E Only

77. Match List-I with List-II :

List - I

- Thread spawn
- Block thread
- Jacketing
- Flush

List - II

- to convert a blocking system call into a nonblocking call.
- to reclaim pages
- processor turn to the execution of another ready thread.
- thread is provided with its own register context.

Choose the correct answer from the options given below :

- A-I, B-III, C-IV, D-II
- A-IV, B-III, C-II, D-I
- A-IV, B-III, C-I, D-II
- A-II, B-I, C-IV, D-III

78. Which of the following is the Markup language?

- HTML
- XML
- DHTML
- LML
- PML

Choose the correct answer from the options given below :

- B, C, D Only
- A, C, D Only
- A, C, D, E Only
- A, B, C Only

79. Which of the followings are type of interface in an ATM network ?

- A. user-to-user B. user-to-network C. network-to-network
D. host-to-network E. user-to-host

Choose the correct answer from the options given below :

- (1) A and B Only (2) B and C Only (3) C and D Only (4) D and E Only

80. For the fuzzy set $A = \{(x_1, 0.3), (x_2, 0.7), (x_3, 0.4)\}$, the complement of A would be represented as :

- (1) $\{(x_1, 0.4), (x_2, 0.3), (x_3, 0.1)\}$ (2) $\{(x_1, 0.3), (x_2, 0.7), (x_3, 0.4)\}$
(3) $\{(x_1, 0.7), (x_2, 0.3), (x_3, 0.6)\}$ (4) $\{(x_1, 0.21), (x_2, 0.28), (x_3, 0.12)\}$

81. The instructions

ADD R₁, A, B

ADD R₂, C, D

MUL X, R₁, R₂

evaluates the $X = (A + B) * (C + D)$ in which of the following ?

- (1) 3 - Address instructions (2) 2 - Address instructions
(3) 1 - Address instructions (4) RISC instructions

82. An ambiguous grammar is one which has :

- A. More than one derivations
B. More than one left most derivations
C. More than one right most derivations
D. More than one Parse tree
E. More than one syntax tree

Choose the correct answer from the options given below :

- (1) A and D Only (2) B and C Only (3) D and E Only (4) A and E Only

83. Back propagation is a learning technique that adjusts weights in the neural network by propagating weight changes :

- (1) Forward from source to hidden nodes
(2) Backward from sink to source
(3) Forward from source to sink
(4) Backward from sink to hidden nodes

84. The Boolean expression for the following would be :
 $F(A, B, C) = \Sigma(0, 2, 6)$
 $d(A, B, C) = \Sigma(1, 3, 5)$
 (1) $A'C' + BC'$ (2) $B + AC'$ (3) $A + BC'$ (4) $A' + BC'$
85. Arrange the following in correct order, so that they can follow a proper run time environment :
 A. Programming statement B. Compilation
 C. Memory allocation D. Type of variable
 E. Memory deallocation
 Choose the correct answer from the options given below :
 (1) A, B, C, D, E (2) A, B, D, C, E
 (3) B, A, D, C, E (4) C, D, B, E, A
86. A computer system with cache access time of 100 ns, a main memory access time of 1100 ns, and a hit ratio of 0.9, then average access time would be :
 (1) 200 ns (2) 190 ns (3) 210 ns (4) 120 ns
87. An IPv4 packet has arrived with the first few hexadecimal digits as shown below. How many hops can this packet travel before being dropped? The data belong to what upper-layer protocol?
 $(5400001800100110040601 \dots)_{16}$
 (1) 01 hops, TCP (2) 02 hops, UDP
 (3) 03 hops, ICMP (4) 4 hops, TCP
88. Arrange the following simple graphs based on number of spanning tree they have :
 A. K_3 [Complete Graph with 3 nodes]
 B. K_4 [Complete Graph with 4 nodes]
 C. $K_{2,2}$ (Complete bipartite graph of the 2 nodes in each partition)
 D. C_5 (Cycle graph of 5 nodes)
 Choose the correct answer from the options given below :
 (1) A, B, C, D (2) A, C, B, D
 (3) A, C, D, B (4) D, B, C, A

89. Match List-I with List-II :

List - I	List - II
A. Channelization protocol	I. ALOHA
B. Bit-oriented protocol	II. TDMA
C. Random-access protocol	III. Reservation
D. Controlled-access protocol	IV. HDLC

Choose the correct answer from the options given below :

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

90. What is the total delay (latency) for a frame size of 10 million bits that is being set up on a link with 20 routers, each having a queuing time of $2 \mu\text{s}$ and a processing time of $1 \mu\text{s}$? The length of link 5000 km. The speed of light inside the link is $2 \times 10^8 \text{ m/s}$. The link has bandwidth of 6 Mbps.

- (1) 0.624050 s. (2) 1.691726 s. (3) 2.425080 s. (4) 1.714030 s.

91. How much time does an algorithm using 2^{50} bit operations need if each bit operation takes 2^{-38} second of time?

- (1) 1 hour (2) 10 minutes (3) 30 minutes (4) 1.5 hour

92. Match List - I with List - II.

List - I	List - II
Boolean Expression	Dual of Boolean Expression
A. $x \cdot (y + 0)$	I. $(\bar{x} + 0) \cdot (\bar{y} \cdot z)$
B. $\bar{x} \cdot 1 + (\bar{y} + z)$	II. $x + y \cdot 1$
C. $\bar{x} \cdot (\bar{y} + 0)$	III. $\bar{x} + \bar{y} \cdot 1$
D. $x \cdot 1 + (y + \bar{z})$	IV. $(x + 0) \cdot (y \cdot \bar{z})$

Choose the correct answer from the options given below :

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

93. A bit string of length four is generated at random. What is probability that it contains at least two consecutive 0's given that first bit is 0?

- (1) $\frac{1}{2}$ (2) $\frac{5}{16}$ (3) $\frac{5}{8}$ (4) $\frac{1}{4}$

94. Services provided by point-to-point protocol (PPP) :
- A. frame format
 - B. establishment of the link
 - C. flow control
 - D. sequence numbering
 - E. authentication

Choose the correct answer from the options given below :

- (1) A, B and E Only
- (2) A, C and D Only
- (3) D, E and B Only
- (4) B, C and D Only

95. Which of the following is/are true in case of tree locking ?

- A. It ensures shorter waiting times.
- B. It ensures freedom from deadlock.
- C. Transaction can lock data items earlier.
- D. It does not ensure greater amount of concurrency.

Choose the correct answer from the options given below :

- (1) A and B Only
- (2) C and D Only
- (3) B and C Only
- (4) A and D Only

96. Arrange the following sets in increasing order, on the basis of their cardinality :

- A. $A_1 = \{\{1, 2\}, \{3\}\}$
- B. $A_2 = \{\{1\}, \{2\}, \{3\}, \{4\}\}$
- C. $A_3 = \{\{1, 2, 3, 4, 5, 6\}\}$
- D. $A_4 = \{\{1, 2\}, \{2, 3, 4\}, \{5\}\}$
- E. $A_5 = \{\{1\}, \{2\}, \{3\}, \{4\}, \{5\}\}$

Choose the correct answer from the options given below :

- (1) A, B, D, E, C
- (2) A, B, E, D, C
- (3) A, C, D, B, E
- (4) C, A, D, B, E

97. The Cardinality of a fuzzy set is :

- (1) 0
- (2) finite
- (3) infinite
- (4) not known

98. Which of the following is not the goal of reverse Engineering ?

- (1) Cope with complexity
- (2) Recover lost information
- (3) Detect side effect
- (4) Data flow

99. The chairs of an auditorium are to be labelled with a letter followed by a positive two digits integer where labelling is starting with A01. How many maximum possible chair could be labelled in this way ?

- (1) 2600
- (2) 2574
- (3) 2340
- (4) 2366

100. Arrange in appropriate order, the construction of a finite automata :
- A. Minimum State DFA B. Regular Expression
C. NFA- ϵ D. Problem Statement
E. DFA

Choose the correct answer from the options given below :

- (1) B, C, E, A, D (2) D, B, C, E, A (3) C, E, B, A, D (4) A, D, C, B, E

101. Lower-triangular sparse matrix is one :

- (1) in which all the non-zero elements lie only on the leading diagonal.
(2) in which all the non-zero elements lie above leading diagonal.
(3) in which all the non-zero elements lie below leading diagonal.
(4) which is not defined for sparse matrix.

102. The following code :

stmt \rightarrow if expr then stmt else stmt

 | if expr then stmt

suffers from :

- (1) Ambiguity (2) Left factoring (3) Left Recursion (4) λ -moves

103. Which of the following is not correct about the virtual memory segmentation ?

- (1) It is not necessary to load all of the segments of a process.
(2) It has no internal fragmentation.
(3) It has large virtual address space.
(4) It provides lower degree of multiprogramming.

104. Match List-I with List-II :

List - I

- A. Union
B. Function
C. Interactive Environment
D. Output device

List - II

- I. Virtual Reality
II. Shadow mask
III. Subroutine
IV. User defined data type

Choose the correct answer from the options given below :

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

105. Z is set of integers, $\langle Z, * \rangle$ forms group if $*$ is :

- (1) $*(a, b) = a + b + 2$ (2) $*(a, b) = 2a + b$
(3) $*(a, b) = (a + b)/2$ (4) $*(a, b) = a^2 + b$

106. Which of the following statements is/are false ?

- A. A user can assign privileges to any user on any relation.
B. A user can assign privileges to any user on its own relations only.
C. System error that leads to accessibility to the portion of database is an example of malicious attack.
D. Passwords itself need to be secured from unauthorized access.

Choose the **correct** answer from the options given below :

- (1) A and C Only (X) A and B Only (X) B and D Only (4) B and C Only

107. Which of the following is **not** a characteristics of a specialized embedded OS ?

- (1) real time scheduling policy.
(2) responds to external interrupts
(3) provides special non-sequential files.
(4) provides fixed or variable sized partitions.

108. What will be the order of the following fields in a frame relay 'frame format' ?

- A. Flag B. FCS C. address D. information

Choose the **correct** answer from the options given below :

- (1) A, C, D, B (2) D, A, C, D (3) C, B, A, D (4) A, B, D, C

109. The techniques used to handle the phantom problem are _____.

- A. Time stamping B. Index locking
C. Predicate locking D. Execution indexing

Choose the **correct** answer from the options given below :

- (1) A and B Only (2) B and C Only (3) A and D Only (4) C and D Only

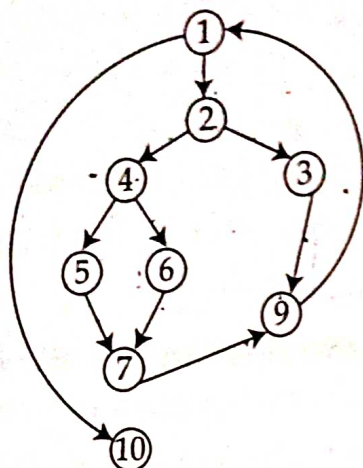
110. The sequence of fields in an IP datagram will be :

- A. flags B. options C. Protocol
D. Identification E. Service type

Choose the **correct** answer from the options given below :

- (1) E, D, A, C, B (2) D, A, B, C, E (3) D, E, C, B, A (4) E, C, D, A, B

111. The cyclomatic complexity of the following flow graph is :



(1) 3

(2) 4

(3) 10

(4) 2

112. IP is responsible for _____ communication while TCP is responsible for _____ communication.

- (1) Node-to-node, Host-to-host (2) Process-to-process, Host-to-host
 (3) Socket-to-socket, Host-to-node (4) Host-to-Host, Process-to-process

113. Arrange the steps of Mathematical Modeling :

- A. Solution fitting with data
 B. Formulation Mathematically
 C. Solve Mathematically
 D. Repeat formulation if it fit worst with data
 E. Interpretation results

Choose the correct answer from the options given below :

- (1) B, C, A, D, E (2) B, A, D, C, E (3) D, A, B, C, E (4) E, D, C, A, B

114. In windows scheduling, which of the following option is correct ?

- (1) 4 non-real-time priorities (2) 8 non-real-time priorities
 (3) 12 non-real-time priorities (4) 16 non-real-time priorities

115. The I/O methods in which memory addresses and I/O addresses are distinct, is called :

- A. Isolated I/O B. Memory-Mapped I/O
 C. Strobe Control D. Handshaking
 E. Interrupt

Choose the most appropriate answer from the options given below :

- (1) A, B Only (2) C, D Only (3) C, E Only (4) B, E Only

116. What will be the ordering of typical steps when processing a high-level query ?

- A. Query optimizer B. Runtime database processor
C. Scanning, passing and validating D. Query code generator

Choose the correct answer from the options given below :

- (1) D, A, C, B (2) C, A, D, B (3) C, D, B, A (4) D, C, B, A

117. Which of the followings are tautology ?

- A. $(p \vee r) \rightarrow p$ B. $p \rightarrow (p \wedge r)$
C. $\sim p \rightarrow (p \rightarrow r)$ D. $(p \wedge r) \rightarrow (p \rightarrow r)$
E. $\sim (p \rightarrow r) \rightarrow p$

Choose the correct answer from the options given below :

- (1) A, B Only (2) A, B, C Only (3) B, C, D Only (4) C, D, E Only

118. Arrange the following from fastest to slowest in speed.

- A. DRAM B. SRAM C. CPU Registers
D. Magnetic tapes E. Hard disk

Choose the correct answer from the options given below :

- (1) A, B, C, D, E (2) C, B, A, D, E (3) C, D, B, A, E (4) B, C, D, A, E

119. The language of the following PDA would be :

$$\delta(q_0, a, z_0) = (q_0, aaaz_0)$$

$$\delta(q_0, a, a) = (q_0, aaaa)$$

$$\delta(q_0, b, a) = (q_1, \lambda)$$

$$\delta(q_1, b, a) = (q_1, \lambda)$$

$$\delta(q_1, \epsilon, z_0) = (q_f, z_0), \text{ where } q_f \text{ is a final state.}$$

- (1) $\{a^n b^n \mid n > 0\}$ (2) $\{a^n b^{2n} \mid n > 0\}$ (3) $\{a^n b^{3n} \mid n > 0\}$ (4) $\{a^n b^{4n} \mid n > 0\}$

120. Regarding the subroutines, see the following sequence of tasks to be performed :

- A. Turn on the interrupt facility on.
B. Service the device whose flag is set.
C. Save the contents of processor registers.
D. Check which flag is set.
E. Restore the contents of processor registers.

Choose the correct answer from the options given below :

- (1) A, D, C, B, E (2) D, A, B, C, E (3) C, D, B, E, A (4) B, D, A, C, E

121. Match List-I with List-II :

- | List - I | List - II |
|----------------------------------|-----------------------|
| A. Verification | I. White box Testing |
| B. Validation | II. Black box Testing |
| C. Internal logic exercise | III. Quality Control |
| D. Software requirement exercise | IV. Quality Assurance |

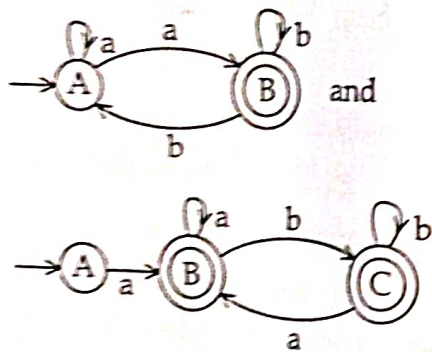
Choose the correct answer from the options given below :

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

122. The parameter Actual count is used in Genetic Algorithm (GA) for :

- | | |
|--------------------------|------------------------------------|
| (1) Crossover | (2) Mutation |
| (3) Selecting population | (4) Encoding the Genetic Algorithm |

123. For the given two machines which of the following is correct ?



- | | |
|----------------------------------|--------------------------------------|
| (1) both Machines are DFAs | (2) both are non-equivalent Machines |
| (3) both are equivalent Machines | (4) cannot be determined |

124. The number of tokens in the following line :

for i in range (begin ; end ; step) :

is :

- | | | | |
|-------|-------|-------|--------|
| (1) 4 | (2) 7 | (3) 8 | (4) 12 |
|-------|-------|-------|--------|

125. Which of the following structures of knowledge representation are the most purely syntactic ?

- | | |
|--------------------------|-------------------------|
| A. Conceptual dependency | B. predicate logic |
| C. slot-and-filler | D. nonmonotonic systems |

Choose the correct answer from the options given below :

- | | | | |
|------------------|------------------|------------------|------------------|
| (1) A and B Only | (2) B and C Only | (3) B and D Only | (4) C and D Only |
|------------------|------------------|------------------|------------------|

126. In Genetic Algorithm's cross over operation, mask is used in ?
- (1) Three parent crossover
 - (2) Two parent crossover
 - (3) Uniform crossover
 - (4) N point crossover

127. Match List - I with List - II.

List - I

- A. Complement
- B. Ex-OR
- C. Accumulator
- D. Control Unit

List - II

- I. Adder
- II. Instruction decoding
- III. Negative number representation
- IV. Arithmetic and Logic operations

Choose the correct answer from the options given below :

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

128. Arrange the following prefix expressions based on their values in increasing order :

- A. $+ - * 2 / 8 4 3 2$
- B. $\uparrow - * 3 3 * 4 2 5$
- C. $+ - \uparrow 3 2 \uparrow 2 3 / 6 - 4 2$
- D. $* + 3 + 3 \uparrow 3 + 1 1 3$

Choose the correct answer from the options given below :

- (1) A, B, C, D
- (2) B, A, C, D
- (3) D, C, B, A
- (4) C, D, A, B

129. Which of the following is **not** the most common property in social network ?

- (1) Degree distribution follows scale free.
- (2) Average shortest path lengths are shorten in connected network.
- (3) Most of them are directed network.
- (4) Follows small world property.

130. For line drawing, which of the following algorithms are used ?

- A. DDA algorithm
- B. Bresenham algorithm
- C. Mid point algorithm
- D. Curve algorithm

Choose the most appropriate answer from the options given below :

- (1) B and C Only
- (2) C and D Only
- (3) A and B Only
- (4) D and A Only

131. According to the Nyquist theorem, to produce the original analog signal, one necessary condition is :

- (1) Sampling rate must be at least 2 times the highest frequency contained in the signal.
- (2) Sampling rate must be at least 2 times the lowest frequency contained in the signal.
- (3) Sampling rate must be at least $\frac{1}{2}$ times the highest frequency contained in the signal.
- (4) Sampling rate must be at least $\frac{1}{2}$ times the lowest frequency contained in the signal.

132. For the fuzzy sets $A = \{(x_1, 0.3), (x_2, 0.7), (x_3, 0.4)\}$ and

$B = \{(x_1, 0.5), (x_2, 0.2), (x_3, 0.5)\}$, the $A \cap B$ would be :

- (1) $\{(x_1, 0.3), (x_2, 0.7), (x_3, 0.4)\}$
- (2) $\{(x_1, 0.5), (x_2, 0.2), (x_3, 0.5)\}$
- (3) $\{(x_1, 0.5), (x_2, 0.7), (x_3, 0.5)\}$
- (4) $\{(x_1, 0.3), (x_2, 0.2), (x_3, 0.4)\}$

133. The least values of a signed and unsigned data type variables requiring 8 bits, would be.....

- (1) 0, 128
- (2) -128, 127
- (3) 0, 0
- (4) -128, 0

134. Which of the followings are true for a complete binary tree ?

- A. It has always odd number of vertices.
- B. With i internal vertices, it has $i + 1$ leaves.
- C. With l leaves it has $l - 1$ vertices.
- D. With $2n - 1$ vertices, it has n leaves.

Choose the correct answer from the options given below :

- (1) A, B, C Only
- (2) B, C Only
- (3) A, D Only
- (4) A, B, C, D

135. For making a memory of size 2048×8 bytes, by using the chips of size 128×4 bytes, the number of chips required is :

- (1) 8
- (2) 16
- (3) 32
- (4) 64

136. Which of the followings are sequential circuit ?

- A. Flip flop
- B. Multiplexer
- D. Decoder
- E. Adder
- C. Counter

Choose the correct answer from the options given below :

- (1) B, D Only
- (2) A, C Only
- (3) C, E Only
- (4) D, A Only

137. Which of the followings are White box Testing ?

- A. Path Testing
- B. Loop Testing
- C. Regression Testing
- D. Non functional Testing

Choose the correct answer from the options given below :

- ✓(1) A and B Only
- (2) B and C Only
- _(3) C and D Only
- (4) A and D Only

138. Techniques for performing I/O :

- A. Programmed I/O
- B. Interrupt-driven I/O
- C. Rotational I/O
- D. Direct memory access
- E. Channelized I/O

Choose the correct answer from the options given below :

- (1) A and C Only
- _(2) A, B and D Only
- (3) A, D and E Only
- (4) B and E Only

139. For the software quality assurance, which of the followings are correct ?

- A. Execution of code
- B. No execution of code
- C. Preventive technique
- D. A corrective technique

Choose the correct answer from the options given below :

- (1) A, B Only
- (2) B, C Only
- (3) C, D Only
- (4) D, A Only

140. Which of the following genetic algorithm operation is computationally most expensive ?

- (1) Convergence testing
- (2) Initial population creation
- (3) Selection of sub-population for mating
- (4) Reproduction to produce next generation

Answer the following 5 questions based on the passage. (141-145)

A firm can produce two type of cloth say A and B. Three kind of wool are required for it, say red wool, green wool and blue wool. One unit length of type A cloth needs 2 yards of red and 3 yards of green wool. One unit length of type B cloth needs 3 yards of red wool, 2 yards of green wool and 2 yards of blue wool. The firm has only a stock of 8 yards of red wool, 10 yards of green wool and 15 yards of blue wool. It is assumed that the income obtained from one unit length of type A and type B cloths are ₹ 30 and ₹ 50, respectively.

141. When we formulate the LPP from the above given passage. Which of the following is a objective function for its dual problem ?

- (1) $\text{Min } P = 5u + 8v + 15w$ (2) $\text{Min } P = 8u + 10v + 15w$
 (3) $\text{Min } P = 15u + 5v + 8w$ (4) $\text{Max } P = 10u + 8v + 15w$

142. Which of the following will be appropriate objectives function for the given problem ?

- (1) $2x + 3y$ (2) $3x + 2y + 2z$
 (3) $30x + 50y$ (4) $3x + 2y$

143. How many unit length used for cloth A when income is maximized ?

- (1) 0.8 unit (2) 2.4 unit (3) 2.8 unit (4) 3.0 unit

144. If x unit length of type A cloths and y unit length of type B cloths, then contrains formulate for the LPP, is :

- (1) $y \leq 7.5, 2x + 3y \leq 8, 3y + 2x \leq 10$
 (2) $y \leq 7.5, 2x + 3y \leq 8, 3x + 2y \leq 10$
 (3) $2x + 3y \leq 8, 3x + 2y + 2z < 15$
 (4) $2x + 3y \leq 10, 3x + 2y \leq 10, 2y \leq 15$

145. On the basis of available material, maximum total income is :

- (1) ₹ 133.3 (2) ₹ 124 (3) ₹ 100 (4) ₹ 153.3

Answer the following 5 questions based on the passage. (146-150)

A company is implementing a new database system to manage its customer information. The database contains tables for customers, orders, products and sales representatives. Each customer can place multiple orders and each order can contain multiple products. Each customer can have specific sales representatives who manages the account. Each order is associated with a sales representative in tracking sales and customer interactions. The database is designed to improve efficiency

146. Which SQL query retrieves the total number of orders placed by a specific customer ?
- (1) Select COUNT (*) As total_orders from orders where customer_id = [Customer_ID];
 - (2) Select COUNT (order_id) As total_orders from orders where customer_id = [Customer_ID];
 - (3) Select COUNT (DISTINCT order_id) As total_orders from orders Where customer_id = [Customer_ID];
 - (4) Select SUM (order_Id) As total_orders from orders where customer_id = [Customer_ID];
147. Based on the passage, which of the following statements is true ?
- (1) Each customer can place only one order.
 - (2) Each sales representative can manage multiple customer accounts.
 - (3) Each order can be associated with only one product.
 - (4) The database does not include a table for products.
148. Which of the following tables is likely to have a foreign key referencing another table in the database system implemented by the company ?
- (1) Customers (2) Orders (3) Products (4) Sales representatives
149. Which SQL query retrieves the total number of distinct customers who have placed orders ?
- (1) Select COUNT (DISTINCT customer_id) As total_customers From orders;
 - (2) Select COUNT (*) As total_customers from customers;
 - (3) Select COUNT (DISTINCT order_id) As total_customers from orders;
 - (4) Select COUNT (DISTINCT customer_id) As total_customers from customers;
150. Which of the following best describes the relationship between the "orders" table and the "Customers" table in the company's database system ?
- (1) One-to-One (2) One-to-Many (3) Many-to-One (4) Many-to-Many

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