CUET PG 2025 Data Science Question Paper

Time Allowed :1 Hour 45 Mins	**Maximum Marks :**300	**Total questions :**75

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The examination duration is 105 minutes. Manage your time effectively to attempt all questions within this period.
2. The total marks for this examination are 300. Aim to maximize your score by strategically answering each question.
3. There are 75 mandatory questions to be attempted in the Atmospheric Science paper. Ensure that all questions are answered.
4. Questions may appear in a shuffled order. Do not assume a fixed sequence and focus on each question as you proceed.
5. The marking of answers will be displayed as you answer. Use this feature to monitor your performance and adjust your strategy as needed.
6. You may mark questions for review and edit your answers later. Make sure to allocate time for reviewing marked questions before final submission.
7. Be aware of the detailed section and sub-section guidelines provided in the exam. Understanding these will aid in effectively navigating the exam.

1. Consider the following relation $R = \{(4,5),(5,4),(7,6),(6,7)\}$ on set $I = \{4,5,6,7\}$. Which of the following properties relation R does not have?

(A) Reflexive property

(B) Symmetric property

(C) Transitive property

(D) Antisymmetric property

Choose the correct answer from the options given below:

(1) A, C and D only

(2) A, B and D only

(3) A, B, C and D

(4) B, C and D only

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2. If an algebraic system $(M, *)$ where M is the set of all non-zero real numbers and $*$ is a binary operator defined by $x * y = \frac{xy}{4}$, which of the following properties are satisfied by M?

(A) Closure Property

(B) Associative Property

(C) Inverse Property

(D) Commutative Property

Choose the correct answer from the options given below:

(1) A, B and C only

(2) A, B and C only

(3) A, B, C and D

(4) B, C and D only

---

3. What will be the output after minimizing the following expression with the help of a K-map?

$$F(X, Y) = XY + XY' + XY$$

(A) X

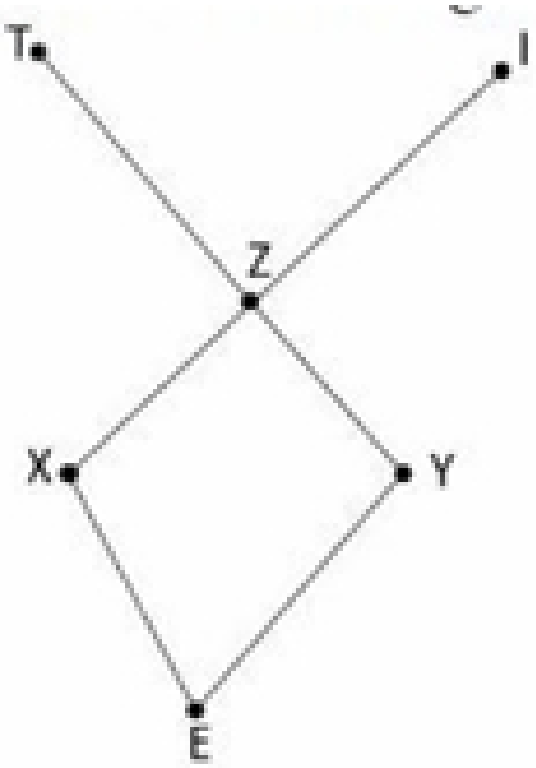
(B) X + Y

(C) X Y

(D) Y

---

4. Find the least upper bound and greatest lower bound of $S = \{X, Y, Z\}$ if they exist, of the poset whose Hasse diagram is shown below:



1. The least upper bound is T and the greatest lower bound is X.
2. The least upper bound is Z and the greatest lower bound is E.
3. The least upper bound is I and the greatest lower bound is Y.
4. The least upper bound is T and the greatest lower bound is Y.

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5. For a Non-deterministic Finite Automaton (NDFA) with N number of states, the equivalent Deterministic Finite Automaton (DFA) has D number of states. Then, possible number of states in DFA can be defined as:

1. $N \times 2$
2. $N + 2$
3. 2^N
4. $N \times D$

---

6. Suppose $D_1 = (S_1, \Sigma, q_1, F_1, \delta_1)$ and $D_2 = (S_2, \Sigma, q_2, F_2, \delta_2)$ are finite automata accepting languages L_1 and L_2, respectively. Then, which of the following languages will also be accepted by the finite automata:

(A) $L_1 \cup L_2$

(B) $L_1 \cap L_2$

(C) $L_1 - L_2$

(D) $L_2 - L_1$

Choose the correct answer from the options given below:

(1) A, B and D only

(2) A, B and C only

(3) A, B, C and D

(4) B, C and D only

---

7. Match LIST-I with LIST-II

Choose the correct answer from the options given below:

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

(2) A - I, B - III, C - D, D - IV

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

LIST-I		LIST-II
A.	A Language L can be accepted by a Finite Automata, if and only if, the set of equivalence classes of L is finite.	III. Myhill-Nerode Theorem
B.	For every finite automaton M = $(Q, \Sigma, q_0, A, \delta)$, the language L(M) is regular.	II. Regular Expression Equivalence
C.	Let, X and Y be two regular expressions over Σ. If X does not contain null, then the equation $R = Y + RX$ in R, has a unique solution (i.e. one and only one solution) given by $R = YX^*$.	I. Arden's Theorem
D.	The regular expressions X and Y are equivalent if the corresponding finite automata are equivalent.	IV. Kleen's Theorem

Table 1: Matching List-I with List-II

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

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8. If L_i is the set of languages of type i for $i = 0, 1, 2$ or 3. Then, as per Chomsky hierarchy, arrange the given set of four languages in order from subset to superset, from left to right.

(A) L_3

(B) L_2

(C) L_1

(D) L_0

Choose the correct answer from the options given below:

(1) A, B, C, D

(2) A, C, D, B

(3) B, A, D, C

(4) C, B, D, A

---

9. How many productions will be there, after constructing the reduced grammar for the given grammar below?

1. $X \rightarrow aYa$
2. Y $\rightarrow Xb$
3. Y $\rightarrow bCC$
4. C $\rightarrow ab$
5. E $\rightarrow aC$
6. Z $\rightarrow aZY$

1. Three
2. Four
3. Five
4. Six

---

10. In a standard Turing Machine T, the transition function $\delta(q, a)$ for $q \in Q$ and $a \in \Gamma$ is defined:

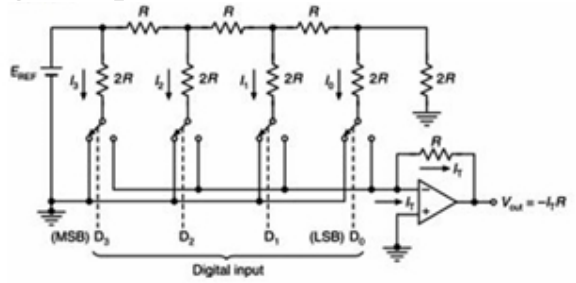
1. For some, not necessarily all elements of $(q, a) \in Q \times \Gamma$
2. For no element of $(q, a) \in Q \times \Gamma$
3. For all elements of $(q, a) \in Q \times \Gamma$
4. For a set of triples with more than one element

---

11. What will be the output, if we compute the 9's complement of the decimal number 782.54?

1. 216.54
2. 217.45
3. 215.45
4. 216.45

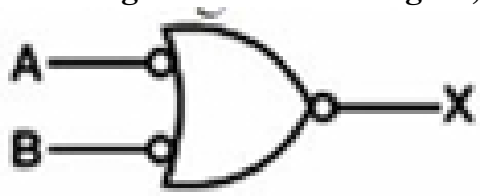
12. The given diagram is of a 4-bit switched current-source Digital to Analog Converter (DAC), where $E_{REF} = 10V$ and $R = 5\,k\Omega$. What will be the output voltage V_{out} for the digital input 1101?



1. 8.125V
2. -8.125V
3. -7.125V
4. 7.125V

---

13. For the gate shown in the figure, the output will be HIGH



(A) If and only if both the inputs are LOW

(B) If and only if both the inputs are HIGH

(C) If one of the inputs is HIGH

(D) If one of the inputs is LOW

---

14. The Prime Implicant (PI) whose each 1 is covered by a minimum of one Essential Prime Implicant (EPI) is known as:

(A) Essential prime implicant

(B) Selective prime implicant

(C) False prime implicant

(D) Redundant prime implicant

---

15. A parallel adder in which the carry-out of each full-adder is the carry-in to the next significant digit adder is known as:

(A) Parallel carry adder

(B) Ripple carry adder

(C) Look-ahead-carry adder

(D) Serial carry adder

---

16. Which flip-flop is not widely available for commercial purposes?

(A) T flip-flop

(B) SR flip-flop

(C) D flip-flop

(D) JK flip-flop

---

17. The expression $X = (A + B) \times (C + D)$ has been evaluated using two address instructions method. The following is the set of instructions used.

(A) MOV R1, A

(B) MUL R1, R2

(C) MOV R2, C

(D) ADD R2, D

(E) MOV X, R1

Choose the correct sequence of instruction execution from the options given below:

1. A, B, C, D
2. A, C, B, D

3. B, A, D, C

4. C, B, D, A

---

18. Which of the following instruction format is used by stack-organised computer?

(A) Zero-Address Instructions

(B) One-Address Instructions

(C) Two-Address Instructions

(D) Three-Address Instructions

---

19. Match LIST-I with LIST-II

LIST-I (Addressing Mode)	**LIST-II (Detail)**
A. Implied Mode	I. Operand is specified in the instruction it
B. Relative Addressing Mode	II. Operand is in register
C. Immediate Mode	III. Zero-Address Instructions
D. Register Mode	IV. Content of program counter is added to the address part of the instr

Choose the correct answer from the options given below:

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

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

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

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

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20. Consider a pipeline system. Let the time it takes to process a sub operation in each segment be equal to $t_p = 20\,\text{ns}$. Assume that the pipeline has $k = 4$ segments and executes $n = 100$ tasks in sequence. Consider a non-pipeline system, assume that $t_n = kt_p$ (a non-pipeline system to perform the operation takes a time equal to t_n to complete each task), where $t_p = 20\,\text{ns}$, $k = 4$. Find the speedup of a pipeline processing over an equivalent non-pipeline processing to execute 100 tasks.

1. 3.88
2. 0.08
3. 0.88
4. 1.88

---

21. The major difficulties that cause the instruction pipeline to deviate from its normal operation are:

(A) Resource conflicts
(B) Stack operation
(C) Data dependency
(D) Branch difficulties

Choose the correct answer from the options given below:

1. A, B and D only
2. B and D only
3. A, C and D only
4. C and D only

---

22. Which among the following statement(s) is/are true in the context of a page replacement policy?

(A) The goal of a page replacement policy is to try to remove the page most likely to be referenced in the immediate future.
(B) First in First Out (FIFO) and Least Recently Used (LRU) are the two most common page replacement algorithms.
(C) The FIFO algorithm selects for replacement the page that has been in memory the longest time.
(D) LRU algorithm is based on the assumption that the least recently loaded page is a better candidate for removal than the least recently used page.

Choose the correct answer from the options given below:

1. A, B and D only
2. B and D only
3. B and C only
4. B, C and D only

---

23. 128 $\times 8 RAM represents$:

1. The capacity of the memory is 128 words of 8 bits per word
2. The capacity of the memory is 8 words of 128 bits per word
3. The capacity of memory is 128 bits of 8 words per bit
4. The capacity of memory is 8 bits of 128 words per bit

---

24. A conditional branch instruction in Microprocessor-

1. checks status of condition code flag and affects some flag register.
2. does not check condition code flag and does not affect any flag register.
3. does not check condition code flag and affects some flag register.
4. checks status of condition code flag and affects all flag registers.

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25. Match LIST-I with LIST-II

LIST-I (Hex Code)	**LIST-II (Instruction)**
A. 4F	I. MOV C,A
B. 80	II. ADD B
C. 47	III. MOV B,A
D. 76	IV. HLT

Choose the correct answer from the options given below:

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

2. A - I, B - II, C - III, D - IV
3. A - I, B - II, C - IV, D - III
4. A - III, B - IV, C - I, D - II

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26. The time required to complete one operation of accessing memory, I/O, or acknowledging an external request by a microprocessor, is known as:

1. One Machine Cycle
2. One Instruction Cycle
3. One T-state
4. One Clock period

---

27. Arrange these interrupt call locations in order of priority (from highest to lowest priority) of the interrupts with whom they are associated with:

A. 003CH
B. 0024H
C. 0034H
D. 002CH

Choose the correct answer from the options given below:

1. A, B, C, D
2. D, C, B, A
3. B, A, C, D
4. B, A, C, D

---

28. Which of the following statements are applicable to 8237 DMA controller for working in the Master Mode:

(A) The signals Input Output Read and Input Output Write are kept in tri-state.

(B) The signals Memory Read and Memory Write are kept in tri-state.

(C) The signals Input Output Read, Input Output Write, Memory Read and Memory Write may all be used as per the data transfer requirement.

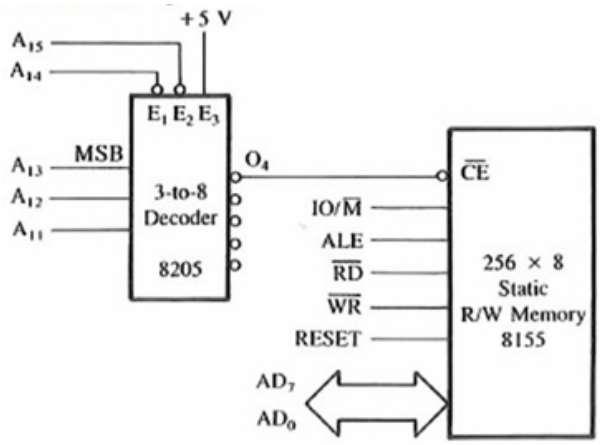
(D) The data transfer can be terminated by sending low End of Process (EOP) from outside, also.

Choose the correct answer from the options given below:

1. A and D only
2. B and D only
3. C and D only
4. B and only

---

29. What will be the foldback memory address range of the following memory chip while interfacing with 8085 microprocessor?



1. 2000H-20FFH
2. 2100H-27FFH
3. 2000H-27FFH
4. 2400H-24FFH

---

30. _____ refers to a set of data values and associated operations that are specified accurately, independent of any particular implementation.

1. Data Structure
2. Abstract Data Type
3. Data Type
4. Array

---

31. Arrange the following data types available in C language according to their size (smallest to largest):

A. signed long int
B. long double
C. unsigned char
D. unsigned int

Choose the correct answer from the options given below:

1. A, B, C, D
2. B, A, C, D
3. B, A, C, D
4. C, D, A, B

---

32. Consider the following code blocks.

A. for (i=0; i¡1000; i++)
    statement block;
B. for (i=0; i¡100; i+=2)
    statement block;
C. for (i=1; i¡1000; i*=2)
    statement block;
D. for (i=0; i¡10; i++)

```
for (j=0; j¡10; j++)
    statement block;
```

1. A, B, C, D
2. A, B, C, D
3. B, A, D, C
4. C, B, D, A

---

33. Match LIST-I with LIST-II

LIST-I	LIST-II
A. The first index comes after the last index.	I. Head-tail Linked List
B. More than one queue in the same array of sufficient size	II. Priority Queue
C. Elements can be inserted or deleted at either end.	III. Circular Queue
D. Each element is assigned a priority.	IV. Multiple Queue

Choose the correct answer from the options given below:

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

---

34. Consider the following statements about arrays. Which of the following are TRUE?

A. The index specifies an offset from the beginning of the array to the element being referenced.

B. Declaring an array means specifying three parameters; data type, name, and its size.

C. The length of an array is given by the number of elements stored in it.

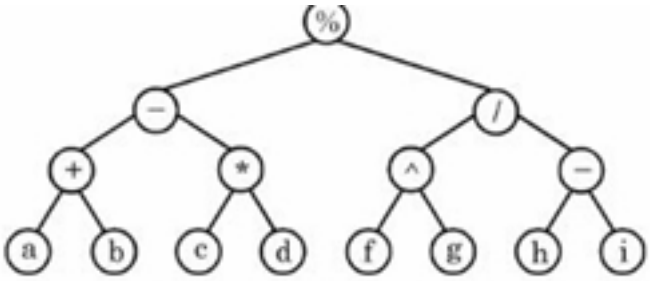
D. The name of an array is a symbolic reference to the address of the first byte of the array.

Choose the correct answer from the options given below:

1. A, B and C only
2. A, B and C only
3. B, D and A only
4. A, B, C and D

---

35. Consider the binary tree given below. What will be the corresponding infix expression to this?



1. ((a + b + c * d) % (f ĝ) / (g - h))
2. (a - b) - (c * d) % ((f î) + (g / h))
3. ((a + b) - (c * d)) % ((f ĝ) / (h - i))
4. ((a + b) - (c * d)) / ((f ĝ) / (h - i))

---

36. Loop invariant allows us to understand and prove the correctness of an algorithm. Which of the following options is NOT to be proven, when we prove the correctness of any algorithm using loop invariant?

1. Sequence
2. Initialization
3. Maintenance
4. Termination

---

37. Match LIST-I with LIST-II

LIST-I (Asymptotic Time Complexity)	LIST-II (Algorithm)
A. Logarithmic (O(lg n))	I. The Tower of Hanoi problem
B. Quadratic ($O(n^2)$)	II. Finding an element in a sorted array
C. Cubic ($O(n^3)$)	III. Bubble sort (worst case)
D. Exponential ($O(2^n)$)	IV. Matrix Multiplication

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

---

38. Which of the following is not the application of Divide and Conquer technique?

1. Quick Sort
2. Strassen's Matrix Multiplication
3. Linear Search
4. Binary Search

---

39. In C language, mat[i][j] is equivalent to: (where mat[i][j] is a two-dimensional array)

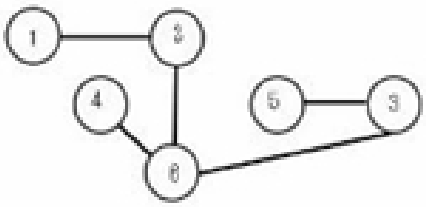
1. `*(mat + i) + j`
2. `(mat + i) + j`
3. `((mat * i) + j)`
4. `*(mat + i + j)`

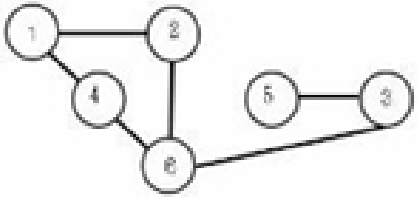
---

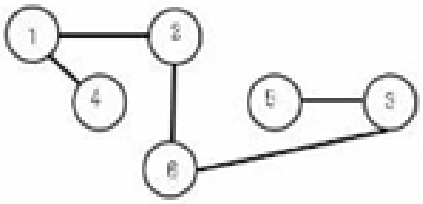
40. Suppose a minimum spanning tree is to be generated for a graph whose edge weights are given below. Identify the graph which represents a valid minimum spanning tree?

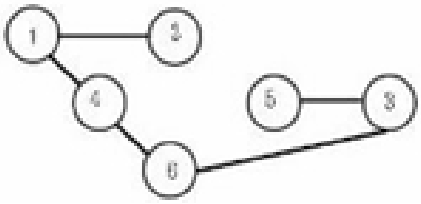
Edges through Vertex points	Weight of the corresponding Edge
(1, 2)	11
(3, 6)	14
(4, 6)	21
(2, 6)	24
(1, 4)	31
(3, 5)	36

Choose the correct answer from the options given below:

1. 

2. 

3. 

4. 

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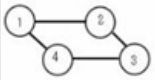
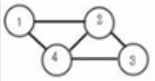
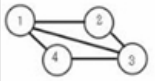
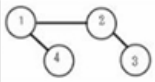
41. Match LIST-I with LIST-II

LIST-I (Graph)		LIST-II (Corresponding Adjacency matrix)	
A.		I.	$\begin{bmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix}$
B.		II.	$\begin{bmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 \end{bmatrix}$
C.		III.	$\begin{bmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{bmatrix}$
D.		IV.	$\begin{bmatrix} 0 & 1 & 1 & 1 \\ 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix}$

Choose the correct answer from the options given below:

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

---

42. The time complexity in order to build a heap of 'n' elements is .....

1. $O(n \log n)$
2. $O(n^2)$
3. $O(\log n^2)$
4. $O(\log \log n)$

---

43. The operating system is not responsible for:

1. process and thread management.
2. the creation and deletion of both; the user and system processes.
3. the development of the program.
4. the process scheduling.

---

44. Process control block in operating system is defined as:

1. Each process is represented in the operating system by a process control block (PCB)—also called a task control block.
2. Process control block is used to store only process state.
3. Process control block is used to control a block.
4. Process control block tells us about logic behind process.

---

45. In the context of process creation, arrange the following statements in sequential order of their occurrence:

A. One of the two processes typically uses the exec() system call to replace the process's memory space with a new program.
B. A new process is created by the fork() system call.
C. The parent can then create more children; or, can issue a wait() system call to move itself off the ready queue.
D. The exec() system call loads a binary file into memory (destroying the memory image of the program containing the exec() system call) and starts its execution.

Choose the correct answer from the options given below:

1. A, B, C, D
2. A, C, B, D
3. B, A, D, C
4. C, B, D, A

---

46. A solution to the critical-section problem must satisfy:

1. Mutual exclusion
2. Progress
3. Support Vector Machine
4. Bounded waiting

---

47. Consider the following set of processes, assumed to have arrived at time 0 in the order P1, P2, P3, P4, and P5, with the given length of the CPU burst (in milliseconds) and their priority:

Process	Burst Time (ms)	Priority
P1	10	3
P2	1	1
P3	4	4
P4	1	2
P5	5	5

Using priority scheduling (where priority 1 denotes the highest priority and priority 5 denotes the lowest priority), find the average waiting time.

1. 5.2 milliseconds
2. 18.2 milliseconds
3. 288.2 milliseconds
4. 8.2 milliseconds

---

48. In a system with multiple instances of resources, the resource allocation graph for deadlock avoidance does NOT contain the following edge:

1. Request edge
2. Assignment edge
3. Claim edge
4. Process edge

---

49. Consider a paging system in which the hit ratio is 80%, TLB (Translation Look Ahead Buffer) access time is 100 nanoseconds, and main memory access time is 100 nanoseconds. Find Effective Access Time (EAT), assuming page-table lookup takes only one memory access.

1. 20 nanoseconds
2. 220 nanoseconds
3. 120 nanoseconds
4. 2 nanoseconds

---

50. A device which connects dissimilar LANs of different topologies, using different sets of communication protocols, is called:

1. Router
2. Bridge
3. Gateway
4. Switch

---

51. Match LIST-I with LIST-II:

LIST-I	**LIST-II**
A. Physical	I. Bit
B. Data Link	II. Frame
C. Network	III. TPDU
D. Transport	IV. Packet

Choose the correct answer from the options given below:

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

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52. Which of the following functionality is to be implemented by the transport layer?

1. Recovery from packet losses
2. Detection of duplicate packets

3. Packet delivery in correct order

4. End to end delivery

---

53. Match LIST-I with LIST-II:

LIST-I	LIST-II
A. 10Base5	I. Thick coax
B. 10Base2	II. Thin coax
C. 10Base-T	III. Fiber optics
D. 10Base-F	IV. Twisted pair

Choose the correct answer from the options given below:

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

---

54. The data link layer has a number of specific functions it can carry out. These functions include:

(A) Providing a well-defined interface to the network layer
(B) Dealing with transmission errors
(C) Regulating the flow of data so that slow receivers are not swamped by fast senders
(D) Routing packets from the source machine to the destination machine

Choose the correct answer from the options given below:

1. A, B and C only
2. A, and C only
3. A, B, and C only
4. B, C and D only

55. What will be the number of cross points needed for a full duplex 8-line cross point switch with no self connections?

1. 64
2. 32
3. 28
4. 36

---

56. Which of the following IP address can be used as a loop-back address?

1. 255.255.255.255
2. 127.0.0.1
3. 0.0.0.0
4. 255.255.255.0

---

57. Arrange the following steps in order in which they take place, while solving problems using State Space Approach.

(A) Identify the set of rules (all possible actions).
(B) Describe the states.
(C) Identify the initial state followed by the goal state.
(D) Find the solution path in the state space.

Choose the correct answer from the options given below:

1. A, C, B, D
2. A, B, C, D
3. B, C, A, D
4. C, B, D, A

---

58. With respect to Artificial Intelligence, find the correct properties of an agent.

(A) An agent's choice of action at any given instant does not depend on its built-in knowledge.
(B) Agents do not interact with the environment.
(C) Agents interact with the environment through sensors and actuators.
(D) An agent's choice of action at any given instant can depend on its built-in knowledge and on the entire percept sequence observed to date, but not on anything it hasn't perceived.

Choose the correct answer from the options given below:

1. A, B and D only
2. C and D only
3. A, B, C and D
4. B, C and D only

---

59. Match LIST-I with LIST-II

LIST-I (Evaluate an algorithm's performance)	
A. Completeness	**I. How long does it take to find a solution? This can**
B. Cost optimality	**II. How n**
C. Time complexity	**III. Is the algorithm guaranteed to find**
D. Space complexity	**IV. Does it fin**

Choose the correct answer from the options given below:

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

---

60. Match LIST-I with LIST-II

LIST-I (Standard logical equivalence)	**LIST-II** (Theorem)
A. $(\alpha \iff \beta) \equiv (\beta \iff \neg\alpha)$	**I.** Biconditional elimination
B. $(\alpha \iff \beta) \equiv ((\alpha \iff \beta) \wedge (\beta \iff \alpha))$	**II.** De Morgan's law
C. $(\alpha \vee \beta) \equiv (\alpha \wedge \neg\beta)$	**III.** Distributivity of $\vee$ over $\wedge$
D. $(\alpha \vee \beta) \equiv (\neg\alpha \vee \neg\beta)$	**IV.** Contraposition

Choose the correct answer from the options given below:

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

---

61. Convert the following statement into First Order Logic: *"For every s, if s is a student, then s is a player"*

(A) s is player(s) student(s)

(B) $\forall s$ player(s) student(s)

(C) s is student(s) player(s)

(D) $\forall s$ student(s) player(s)

---

62. Consider the following arguments and determine whether they are valid.

A. Either I will get good marks or I will not graduate. If I did not graduate I will go to America. I got good marks. Thus, I would not go to America.

B. Either I will pass the examination or I will not graduate. If I do not graduate I will go to America. I failed. Thus, I will go to America.

C. If I study then I will pass examination. If I do not go to shopping then I will study. But I failed examination. Therefore, I went to shopping.

D. If the mall is free then there is no inflation. If there is no inflation then there are price controls. Since there are price controls, therefore, the mall is free.

Choose the correct valid arguments from the options given below:

(A) A and D only

(B) A, C and D only

(C) A, B and D only

(D) A, B, C and D - II

---

63. If we encrypt the following plain text using rail fence technique with depth 2, what will be the encrypted message?

Plain Text = *DIFFICULTWAYLEADSTODESTINATION*

(A) DFITUALASOETNTOIFCLWYEDTSAIN

(B) DFITUALASOETNDSAINFOCLWYEDT

(C) DFITUALAYETDTSIANSOETNTOIFCLW

(D) DFITUOIFCLWYEDTDSIANTALASOETN

---

64. In Playfair cipher what happens when two identical letters appear in the same pair?

(A) letters must be separated with a filler letter such as 'x'.

(B) one letter must be deleted.

(C) letters must be swapped.

(D) both letters must be deleted.

---

65. Match LIST-I with LIST-II

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

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

LIST-I	LIS
A. Encipherment	I. The use of mathematical algorithms to transform data into a form that is not re
B. Digital Signature	II. Cryptographic transformation of a data unit that allows a recipient of the data
C. Access Control	IV. A variety of mechanisms that enforce access rights to resources.
D. Data Integrity	III. A variety of mechanisms used to assure the integrity of a data unit or stream

Table 2: Matching Items in LIST-I with LIST-II

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

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

Q66. Which of the following is not included in the CIA triad?

(A) Integrity

(B) Availability

(C) Authenticity

(D) Confidentiality

Q67. If a cryptanalyst only knows the encryption algorithm and ciphertext, then which type of attack can be performed by him?

(A) Known Plaintext Attack

(B) Ciphertext Only Attack

(C) Chosen Plaintext Attack

(D) Chosen Text Attack

Q68. If it is known that a given ciphertext is Caesar Cipher, then a brute-force cryptanalysis requires _____ keys to try.

(A) 25

(B) 26

(C) 2^{25}

(D) 2^{26}

Q69. The agent observes input-output pairs and learns a function that this learning maps from input to output. For example, the inputs could be camera images, each one accompanied by an output saying "bus" or "pedestrian," etc. This type of learning is known as:

(A) Supervised

(B) Unsupervised

(C) Reinforcement

(D) Semi-supervised

Q70. ____ is the process of computing the distribution over past states given evidence up to the present.

(A) Smoothing

(B) Normalization

(C) Clustering

(D) Alpha Normalization

Q71. When the output is one of a finite set of values (such as sunny/cloudy/rainy or true/false), the learning problem is known as:

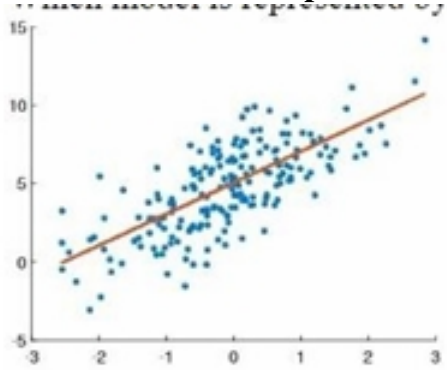
(A) Classification

(B) Clustering

(C) Regression

(D) Optimization

Q72. Which model is represented by the following graph?



(A) Logistic regression model

(B) Simple Linear regression model

(C) Multiple linear regression model

(D) k nearest neighbor model

Q73. The term ”Residual” is defined as:

(A) Fraction of all the test data’s variance that is accounted for by the model.

(B) The difference between the value predicted for a data point and the actual observed value.

(C) A regression method where we tune our model parameters so as to minimize sum of the distances between data points.

(D) Actual predicted value.

Q74. Which among the following is not a valid distance specifying criterion between the clusters, in the context of hierarchical clustering?

(A) Single linkage

(B) Group Average

(C) Complete Linkage

(D) Double linkage

Q75. In k-means algorithm, if there are n data points, then what is the minimum value of k and the maximum value of k?

(A) Minimum value of k=1, maximum value of k=n/2

(B) Minimum value of k=1, maximum value of k=n

(C) Minimum value of k=n/2, maximum value of k=n

(D) Minimum value of k=2, maximum value of k=n
