National Testing Agency

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Data Science Artificial Intelligence Cyber Security And Computer Science

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Data Science Artificial Intelligence Cyber Security And Computer Science

Section Id :	7311307
Section Number :	1
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Number of Questions :	75
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Sub-Section Number :	1
Sub-Section Id :	7311307
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 731130451 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 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

Options :

7311301801. 1

7311301802. 2

7311301803. 3

7311301804. 4

Question Number : 2 Question Id : 731130452 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 = 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 D only

2. A, B and C only

3. A, B, C and D

4. B, C and D only

Options :

7311301805. 1

7311301806. 2

7311301807. 3

7311301808. 4

Question Number : 3 Question Id : 731130453 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

What will be the output after minimizing the following expression with the help of a K-map?
$F(X,Y)=XY+\overline{X}Y+\overline{Y}X$

1. X

2. X+Y

3. XY

4. Y

Options :

7311301809. 1

7311301810. 2

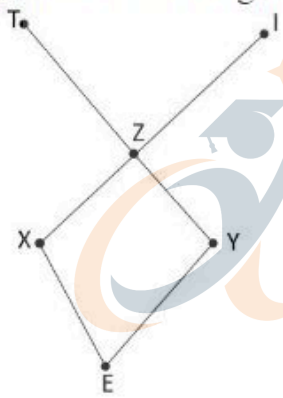
7311301811. 3

7311301812. 4

Question Number : 4 Question Id : 731130454 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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.

Options :

7311301813. 1

7311301814. 2

7311301815. 3

7311301816. 4

Question Number : 5 Question Id : 731130455 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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×2

2. N÷2

3. 2^N

4. N×D

Options :

7311301817. 1

7311301818. 2

7311301819. 3

7311301820. 4

Question Number : 6 Question Id : 731130456 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Suppose D1 = (S1, ∑, q1,F1, δ1) and D2 = (S2,∑, q2,F2, δ2) are finite automata accepting languages L1 and L2, respectively. Then, which of the following languages will also be accepted by the finite automata:

A. L1 ∪ L2
B. L1 ∩ L2
C. L1 − L2
D. L2 − L1

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

Options :

7311301821. 1

7311301822. 2

7311301823. 3

7311301824. 4

Question Number : 7 Question Id : 731130457 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match **LIST-I** with **LIST-II**

	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 I_L is finite.	I.	Arden's Theorem
B.	For every finite automaton M = (Q, ∑, q_0,A, δ), the language L(M) is regular.	II.	Regular Expression Equivalence
C.	Let, X and Y be two regular expressions over ∑. 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*.	III.	Myhill-Nerode Theorem
D.	The regular expressions X and Y are equivalent if the corresponding finite automata are equivalent.	IV.	Kleen's Theorem

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

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

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

Options :

7311301825. 1

7311301826. 2

7311301827. 3

7311301828. 4

Question Number : 8 Question Id : 731130458 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 super set, 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

Options :

7311301829. 1
7311301830. 2
7311301831. 3
7311301832. 4

Question Number : 9 Question Id : 731130459 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

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

1. X → aYa
2. Y → Xb
3. Y → bCC
4. Y → ZaY
5. C → abb
6. C → ZZ
7. E → aC
8. Z→ aZY

1. Three

2. Four

3. Five

4. Six

Options :

7311301833. 1
7311301834. 2
7311301835. 3
7311301836. 4

Question Number : 10 Question Id : 731130460 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. For some, not necessarily for 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

Options :

7311301837. 1

7311301838. 2

7311301839. 3

7311301840. 4

Question Number : 11 Question Id : 731130461 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Options :

7311301841. 1

7311301842. 2

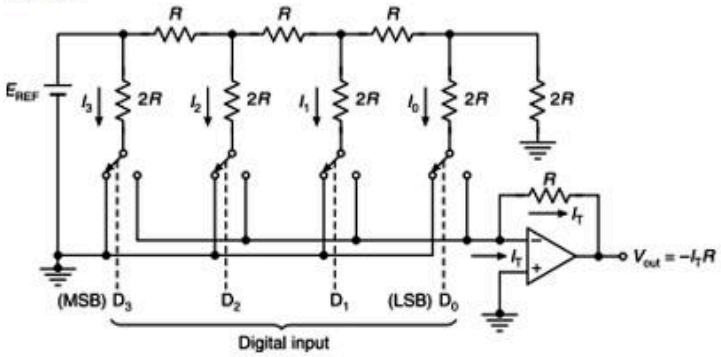
7311301843. 3

7311301844. 4

Question Number : 12 Question Id : 731130462 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The given diagram is of a 4–bit switched current-source Digital to Analog Converter (DAC), where E_{REF} = 10 V and R = 5 kΩ. 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

Options :

7311301845. 1

7311301846. 2

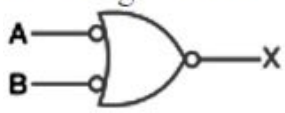
7311301847. 3

7311301848. 4

Question Number : 13 Question Id : 731130463 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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



1. If and only if both the inputs are LOW

2. If and only if both the inputs are HIGH

3. If one of the inputs is HIGH

4. If one of the inputs is LOW

Options :

7311301849. 1

7311301850. 2

7311301851. 3

7311301852. 4

Question Number : 14 Question Id : 731130464 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. Essential prime implicant

2. Selective prime implicant

3. False prime implicant

4. Redundant prime implicant

Options :

7311301853. 1

7311301854. 2

7311301855. 3

7311301856. 4

Question Number : 15 Question Id : 731130465 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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:

1. Parallel carry adder

2. Ripple carry adder

3. Look-ahead-carry adder

4. Serial carry adder

Options :

7311301857. 1

7311301858. 2

7311301859. 3

7311301860. 4

Question Number : 16 Question Id : 731130466 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. T flip-flop

2. SR flip-flop

3. D flip-flop

4. JK flip-flop

Options :

7311301861. 1

7311301862. 2

7311301863. 3

7311301864. 4

Question Number : 17 Question Id : 731130467 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

A. MOV R1, A
   ADD R1, B
B. MUL R1, R2
C. MOV R2, C
   ADD R2, D
D. 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

Options :

7311301865. 1

7311301866. 2

7311301867. 3

7311301868. 4

Question Number : 18 Question Id : 731130468 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. Zero-Address Instructions

2. One-Address Instructions

3. Two-Address Instructions

4. Three-Address Instructions

Options :

7311301869. 1

7311301870. 2

7311301871. 3

7311301872. 4

Question Number : 19 Question Id : 731130469 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match **LIST-I** with **LIST-II**

LIST-I (Addressing Mode)		LIST-II (Detail)	
A.	Implied Mode	I.	Operand is specified in the instruction itself
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 instruction to obtain effective address

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

Options :

7311301873. 1

7311301874. 2

7311301875. 3

7311301876. 4

Question Number : 20 Question Id : 731130470 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Consider a pipeline system. Let the time it takes to process a sub operation in each segment be equal to $t_p = 20$ 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 $t_p = 20$ 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

Options :

7311301877. 1

7311301878. 2

7311301879. 3
7311301880. 4

Question Number : 21 Question Id : 731130471 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

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

Options :
7311301881. 1
7311301882. 2
7311301883. 3
7311301884. 4

Question Number : 22 Question Id : 731130472 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

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

Options :

7311301885. 1

7311301886. 2

7311301887. 3

7311301888. 4

Question Number : 23 Question Id : 731130473 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

128 × 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

Options :

7311301889. 1

7311301890. 2

7311301891. 3

7311301892. 4

Question Number : 24 Question Id : 731130474 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 does not affect any flag register.

Options :

7311301893. 1

7311301894. 2

7311301895. 3

7311301896. 4

Question Number : 25 Question Id : 731130475 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Options :

7311301897. 1

7311301898. 2

7311301899. 3

7311301900. 4

Question Number : 26 Question Id : 731130476 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Options :

7311301901. 1

7311301902. 2

7311301903. 3

7311301904. 4

Question Number : 27 Question Id : 731130477 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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, D, C

4. B, A, C, D

Options :

7311301905. 1

7311301906. 2

7311301907. 3

7311301908. 4

Question Number : 28 Question Id : 731130478 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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.

1. A and D only

2. B and D only

3. C and D only

4. B and C only

Options :

7311301909. 1

7311301910. 2

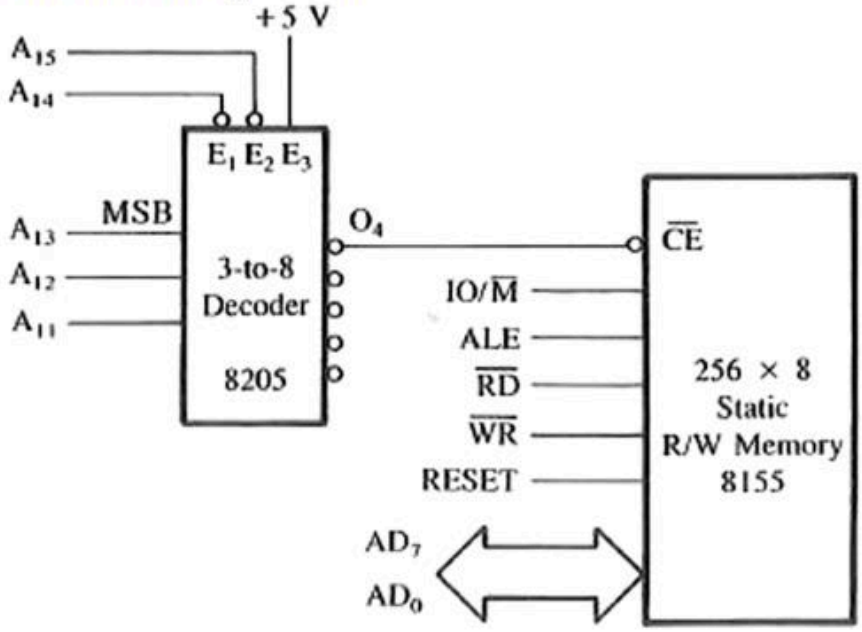
7311301911. 3

7311301912. 4

Question Number : 29 Question Id : 731130479 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Options :

7311301913. 1

7311301914. 2

7311301915. 3

7311301916. 4

Question Number : 30 Question Id : 731130480 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

_____ 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

Options :

7311301917. 1

7311301918. 2

7311301919. 3

7311301920. 4

Question Number : 31 Question Id : 731130481 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. A, B, C, D

2. B, A, D, C

3. B, A, C, D

4. C, D, A, B

Options :

7311301921. 1

7311301922. 2

7311301923. 3

7311301924. 4

Question Number : 32 Question Id : 731130482 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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;
```

Arrange the number of iterations of the above loops (number of times 'statement block' is executed) in ascending order.

1. A, B, C, D

2. A, C, B, D

3. B, A, D, C

4. C, B, D, A

Options :

7311301925. 1

7311301926. 2

7311301927. 3

7311301928. 4

Question Number : 33 Question Id : 731130483 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 - IV, C - I, D - II

Options :

7311301929. 1

7311301930. 2

7311301931. 3

7311301932. 4

Question Number : 34 Question Id : 731130484 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 D only

2. A, B and C only

3. B, D and A only

4. A, B, C and D

Options :

7311301933. 1

7311301934. 2

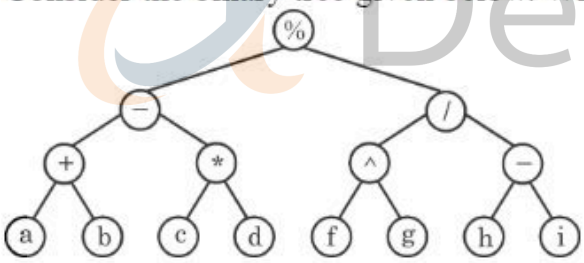
7311301935. 3

7311301936. 4

Question Number : 35 Question Id : 731130485 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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



1. ((a + b + c * d)) % (f ^ g) / (g – h)

2. (a + b) – (c * d) % ((f ^ i) + (g / h))

3. ((a + b) – (c * d)) % ((f ^g) / (h – i))

4. ((a + b) – (c * d)) / ((f ^ g) / h – i)

Options :

7311301937. 1

7311301938. 2

7311301939. 3

7311301940. 4

Question Number : 36 Question Id : 731130486 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Options :

7311301941. 1

7311301942. 2

7311301943. 3

7311301944. 4

Question Number : 37 Question Id : 731130487 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 - IV, C - I, D - II

Options :

7311301945. 1

7311301946. 2

7311301947. 3

7311301948. 4

Question Number : 38 Question Id : 731130488 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Options :

7311301949. 1

7311301950. 2

7311301951. 3

7311301952. 4

Question Number : 39 Question Id : 731130489 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 + j) + j)

Options :

7311301953. 1

7311301954. 2

7311301955. 3

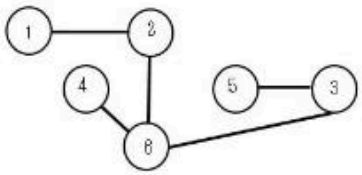
7311301956. 4

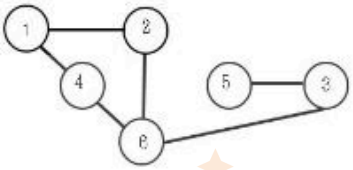
Question Number : 40 Question Id : 731130490 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

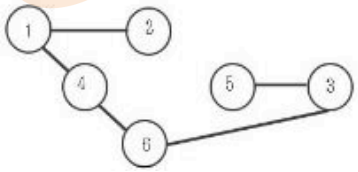
Suppose a minimum spanning tree is to be generated for a graph whose edge weights are given below. Identify the graph which represents a valid minimum spanning tree?

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

1. 

2. 

3. 

4. 

Options :

7311301957. 1

7311301958. 2

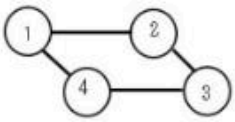
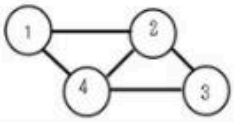
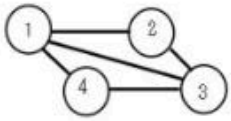
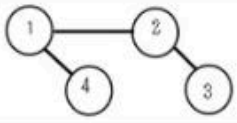
7311301959. 3

7311301960. 4

Question Number : 41 Question Id : 731130491 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match **LIST-I** with **LIST-I**

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

Options :

7311301961. 1

7311301962. 2

7311301963. 3

7311301964. 4

Question Number : 42 Question Id : 731130492 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. O(n lg n)

2. $O(n^2)$

3. $O(\lg n^2)$

4. O(lg lg n)

Options :

7311301965. 1

7311301966. 2

7311301967. 3

7311301968. 4

Question Number : 43 Question Id : 731130493 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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.

Options :

7311301969. 1

7311301970. 2

7311301971. 3

7311301972. 4

Question Number : 44 Question Id : 731130494 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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.

Options :

7311301973. 1

7311301974. 2

7311301975. 3

7311301976. 4

Question Number : 45 Question Id : 731130495 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In the context of process creation, arrange the following statements in sequntial 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

Options :

7311301977. 1

7311301978. 2

7311301979. 3

7311301980. 4

Question Number : 46 Question Id : 731130496 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

A solution to the critical-section problem must satisfy

A. Mutual exclusion
B. Progress
C. Support Vector Machine
D. Bounded waiting

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

Options :

7311301981. 1

7311301982. 2

7311301983. 3

7311301984. 4

Question Number : 47 Question Id : 731130497 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Consider the following set of processes, assumed to have arrived at time 0 in the order P_1, P_2, P_3, P_4, and P_5, with the given length of the CPU burst (in milliseconds) and their priority:

Process	Burst Time	Priority
P_1	10	3
P_2	1	1
P_3	2	4
P_4	1	5
P_5	5	2

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.

Options :

7311301985. 1

7311301986. 2

7311301987. 3

7311301988. 4

Question Number : 48 Question Id : 731130498 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Options :

7311301989. 1

7311301990. 2

7311301991. 3

7311301992. 4

Question Number : 49 Question Id : 731130499 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Options :

7311301993. 1

7311301994. 2

7311301995. 3

7311301996. 4

Question Number : 50 Question Id : 731130500 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Options :

7311301997. 1

7311301998. 2

7311301999. 3

7311302000. 4

Question Number : 51 Question Id : 731130501 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match **LIST-I** with **LIST-II**

LIST-I Layer Name		LIST-II Name of Unit Exchanged	
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 - IV, C - I, D - II

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

Options :

7311302001. 1

7311302002. 2

7311302003. 3

7311302004. 4

Question Number : 52 Question Id : 731130502 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. Recovery from packet loses

2. Detection of duplicate packets

3. Packet delivery in correct order

4. End to end delivery

Options :

7311302005. 1

7311302006. 2

7311302007. 3

7311302008. 4

Question Number : 53 Question Id : 731130503 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 - II, C - IV, D - III

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

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

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

Options :

7311302009. 1

7311302010. 2

7311302011. 3

7311302012. 4

Question Number : 54 Question Id : 731130504 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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 D only

2. A, and C only

3. A, B, and C only

4. B, C and D only

Options :

7311302013. 1

7311302014. 2

7311302015. 3

7311302016. 4

Question Number : 55 Question Id : 731130505 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Options :

7311302017. 1

7311302018. 2

7311302019. 3

7311302020. 4

Question Number : 56 Question Id : 731130506 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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. 0.255.255.255

Options :

7311302021. 1

7311302022. 2

7311302023. 3

7311302024. 4

Question Number : 57 Question Id : 731130507 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Options :

7311302025. 1

7311302026. 2

7311302027. 3

7311302028. 4

Question Number : 58 Question Id : 731130508 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Options :

7311302029. 1

7311302030. 2

7311302031. 3

7311302032. 4

Question Number : 59 Question Id : 731130509 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match **LIST-I** with **LIST-II**

LIST-I **Evaluate an algorithm's performance**		**LIST-II** **Meaning**	
A.	Completeness	I.	How long does it take to find a solution? This can be measured in seconds, or more abstractly by the number of states and actions considered.
B.	Cost optimality	II.	How much memory is needed to perform the operation?
C.	Time complexity	III.	Is the algorithm guaranteed to find a solution when there is one, and to correctly report failure when there is none?
D.	Space complexity	IV.	Does it find a solution with the lowest path cost of all solutions?

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

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

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

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

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

Options :

7311302033. 1

7311302034. 2

7311302035. 3

7311302036. 4

Question Number : 60 Question Id : 731130510 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match **LIST-I** with **LIST-II**

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

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

Options :

7311302037. 1

7311302038. 2

7311302039. 3

7311302040. 4

Question Number : 61 Question Id : 731130511 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. $\exists$ s player(s) student(s)

2. $\forall$ s player(s) student(s)

3. $\exists$ s student(s) player(s)

4. $\forall$ s student(s) player(s)

Options :

7311302041. 1

7311302042. 2

7311302043. 3

7311302044. 4

Question Number : 62 Question Id : 731130512 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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:

1. A and D only

2. A, C and D only

3. A, B and D only

4. A, B, C and D

Options :

7311302045. 1

7311302046. 2

7311302047. 3

7311302048. 4

Question Number : 63 Question Id : 731130513 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

Plain Text = DIFFICULTWAYLEADSTODESTINATION

1. DFIUTALASOETNTOIFCLWYEDTDSIAIN

2. DFIUTALASOETNTDSIAINOIFCLWYEDT

3. DFIUTALAYEDTDSIAINSOETNTOIFCLW

4. DFIUTOIFCLWYEDTDSIAINTALASOETN

Options :

7311302049. 1

7311302050. 2

7311302051. 3

7311302052. 4

Question Number : 64 Question Id : 731130514 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. letters must be separated with a filler letter such as 'x'.

2. one letter must be deleted.

3. letters must be swapped.

4. both letters must be deleted.

Options :

7311302053. 1

7311302054. 2

7311302055. 3

7311302056. 4

Question Number : 65 Question Id : 731130515 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match **LIST-I** with **LIST-II**

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

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

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

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

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

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

Options :

7311302057. 1

7311302058. 2

7311302059. 3

7311302060. 4

Question Number : 66 Question Id : 731130516 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. Integrity

2. Availability

3. Authenticity

4. Confidentiality

Options :

7311302061. 1

7311302062. 2

7311302063. 3

7311302064. 4

Question Number : 67 Question Id : 731130517 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. Known Plaintext Attack

2. Ciphertext Only Attack

3. Chosen plaintext attack

4. Chosen text attack

Options :

7311302065. 1

7311302066. 2

7311302067. 3

7311302068. 4

Question Number : 68 Question Id : 731130518 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. 25
2. 26
3. 2^{25}
4. 2^{26}

Options :

7311302069. 1
7311302070. 2
7311302071. 3
7311302072. 4

Question Number : 69 Question Id : 731130519 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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:

1. Supervised
2. Unsupervised
3. Reinforcement
4. Semi-supervised

Options :

7311302073. 1
7311302074. 2
7311302075. 3
7311302076. 4

Question Number : 70 Question Id : 731130520 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. Smoothing
2. Normalization
3. Clustering
4. Alpha Normalization

Options :

7311302077. 1

7311302078. 2

7311302079. 3

7311302080. 4

Question Number : 71 Question Id : 731130521 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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:

1. Classification

2. Clustering

3. Regression

4. Optimization

Options :

7311302081. 1

7311302082. 2

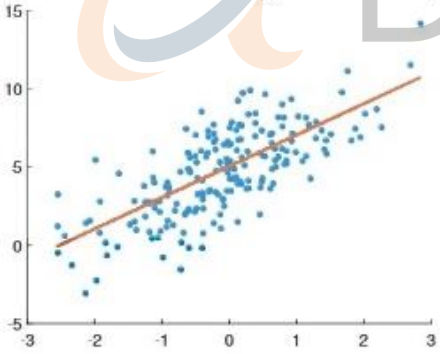
7311302083. 3

7311302084. 4

Question Number : 72 Question Id : 731130522 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which model is represented by the following graph?



1. Logistic regression model

2. Simple Linear regression model

3. Multiple linear regression model

4. k nearest neighbor model

Options :

7311302085. 1

7311302086. 2

7311302087. 3

7311302088. 4

Question Number : 73 Question Id : 731130523 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The term "Residual" is defined as:

1. Fraction of all the test data's variance that is accounted for by the model.
2. The difference between the value predicted for a data point and the actual observed value.
3. A regression method where we tune our model parameters so as to minimize sum of the distances between data points.
4. Actual predicted value.

Options :

7311302089. 1

7311302090. 2

7311302091. 3

7311302092. 4

Question Number : 74 Question Id : 731130524 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. Single linkage
2. Group Average
3. Complete Linkage
4. Double linkage

Options :

7311302093. 1

7311302094. 2

7311302095. 3

7311302096. 4

Question Number : 75 Question Id : 731130525 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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

1. minimum value of k=1, maximum value of k =n/2
2. minimum value of k=1, maximum value of k =n
3. minimum value of k=n/2, maximum value of k =n
4. minimum value of k=2, maximum value of k =n

Options :

7311302097. 1

7311302098. 2

7311302099. 3

7311302100. 4