



Ashima Garg

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 Computer Science Engineering(CS)

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## GATE MOCK TEST 4 GATE 2019 - REPORTS

[OVERALL ANALYSIS](#)
[COMPARISON REPORT](#)
[SOLUTION REPORT](#)

ALL(65)

CORRECT(1)

INCORRECT(0)

SKIPPED(64)

### Q. 1

Choose the correct meaning of proverb/idiom  
 'To end in smoke'

[Solution Video](#) | [Have any Doubt ?](#) | 

A

To completely understand

B

To ruin oneself

Your answer is **Correct****Solution :**

(b)

C

To give applause

D

To overpower someone

QUESTION ANALYTICS

### Q. 2

Choose the correct alternative to the underlined part of the sentence  
If the room had been brighter, I would have been able to read for a while before bed time.

[Solution Video](#) | [Have any Doubt ?](#) | 

A

If the room was brighter

B

If the room are brighter

C

Had the room been brighter

Correct Option

**Solution :**

(c)

D

No improvement

QUESTION ANALYTICS

### Q. 3

Choose the option which can be substituted for the given word/sentence.  
 'One who dabbles in fine arts for the love of it and not for monetary gains'



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 B  
 Amateur

Correct Option

**Solution :**  
 (b)

 C  
 Professional

 D  
 Dilettante

QUESTION ANALYTICS

**Q. 4**

If 's' denotes the sum of the integers from 1 to 30, inclusive and 't' denotes the sum of the integers from 31 to 60 inclusive. What is 't-s'?

 [Solution Video](#)  [Have any Doubt ?](#)

 A  
 800

 B  
 900

Correct Option

**Solution :**  
 (b)

$$t = 31 + 32 + \dots + 59 + 60$$

$$s = 1 + 2 + \dots + 29 + 30$$

$$\text{So } t - s = (31 - 1) + (32 - 2) + \dots + (59 - 29) + (60 - 30) \text{ i.e.}$$

30 terms and each equals 30

$$\text{Hence } t - s = 30 \times 30 = 900$$

 C  
 1000

 D  
 1100

QUESTION ANALYTICS

**Q. 5**
 What is the remainder when  $2^{28}$  is divided by 3?

 [Solution Video](#)  [Have any Doubt ?](#)

1

Correct Option

**Solution :**  
 1

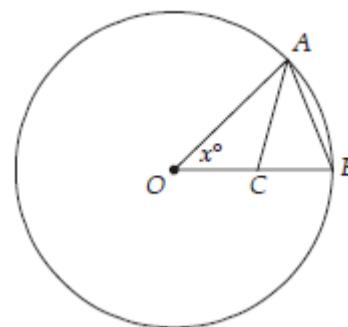
$$\text{Remainder of } \frac{2^{28}}{3} = \text{Remainder of } \frac{(3-1)^{28}}{3} = \text{Remainder of } \frac{(-1)^{28}}{3} = \text{Remainder of } \frac{1}{3} =$$



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**Q. 6**

In the figure below, point O is the center of the circle and  $OC = AC = AB$ . What is the value of  $x$ ?


[Solution Video](#) | [Have any Doubt ?](#) | [Bookmark](#)

A

40

B

36

Correct Option

**Solution :**

(b)

In triangle OAB, Angle O + Angle A + Angle B = 180 -----1

OA = OB (Radius)

 $\Rightarrow$  Angle A = Angle B

In triangle ACE,

Angle C = Angle O + Angle OAC (Sum of interior opposite angles)

 $\Rightarrow$  Angle ACB =  $2x$ ;

Also, AC = AB

 $\Rightarrow$  Angle ACB = Angle ABC =  $2x$  eachThus, Angle A = Angle B =  $2x$  each.

So, substituting in 1

$$5x = 180$$

$$\Rightarrow x = 36 \text{ degrees}$$

C

34

D

32

**QUESTION ANALYTICS****Q. 7**

An empty swimming pool is being filled by a hose that runs at 3 cubic feet per minute for 60 minutes. The square swimming pool is 12 feet wide. How deep is the water in the pool?

[Solution Video](#) | [Have any Doubt ?](#) | [Bookmark](#)

A

25 inches

B

1 ft. 2.5 inches

C

1 ft. 3 inches

Correct Option

**Solution :**

(c)

Total water filled in 60 mins =  $60 \times 3 = 180$  cubic feetVolume of the swimming pool =  $x \times x \times h$



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- D  
1 ft. 4 inches

## QUESTION ANALYTICS

**Q. 8**

How many 5 letter words (with or without meaning) can be formed using all the following 5 letters A, B, C, D and E so that letter A is to the left of letter B?

[Solution Video](#) | [Have any Doubt ?](#)

- A  
120

- B  
60

Correct Option

**Solution :**

(b)

Total ways of arranging 5 letters in any possible order =  $5 \times 4 \times 3 \times 2 \times 1 = 5! = 120$

In half of the cases A will be to the left of B and in other half A will be to the right of B

Hence, desired outcome =  $\frac{120}{2} = 60$

- C  
48

- D  
24

## QUESTION ANALYTICS

**Q. 9**

It takes 60 days to fill a laboratory dish with bacteria. If the size of the bacteria doubles each day, how long did it take for the bacteria to fill one half of the dish?

[Solution Video](#) | [Have any Doubt ?](#)

- A  
20 days

- B  
30 days

- C  
48 days

- D  
59 days

Correct Option

**Solution :**

(d)

Since it takes 60 days to fill the dish and the population doubles each day, then the dish will be half full after 59 days. 1 day later (so after 60 days) the population will double again and the dish will be full.

## QUESTION ANALYTICS



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On Monday, Viraat started training for a marathon and ran one mile that day. On Tuesday, Viraat ran one mile more than he did on Monday. He continues this training process for 12 days. The sum of the total number of miles Viraat ran has how many distinct prime factors?

[Solution Video](#) | [Have any Doubt ?](#) | 

3

Correct Option

**Solution :**

3

Distance travelled 1 to 12 days = { 1, 2, 3, 4, 5, 6, 7, ..., 12}

$$\text{Total distance} = \frac{[12(12+1)]}{2} = \frac{12 \times 13}{2} = 6 \times 13 = 2 \times 3 \times 13$$

Thus, 3 prime factors

QUESTION ANALYTICS

**Q. 11**The number of strings in  $\{0, 1\}^*$  which satisfies  $w^k = w^{k+1}$  for all  $k \geq 0$  is
[Have any Doubt ?](#) | 

A

1

B

2

C

0

Correct Option

**Solution :**

(c)

The only string which satisfies the above condition is  $\in$ , but since  $\in$  does not belong to  $\{0, 1\}^*$ , therefore the number of such strings will be 0.

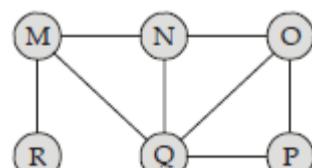
D

3

QUESTION ANALYTICS

**Q. 12**

Consider the following undirected graph.



BFS algorithm is run on the above graph. Which of the following is possible orders of visiting the nodes in the graph?

[Have any Doubt ?](#) | 

A

MNOPQR

Correct Option

**Solution :**

(a)

Out of the given options, only (d) is the correct order in which the nodes can be visited using BFS algorithm.



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## NQMPOR

C

QMNRPOP

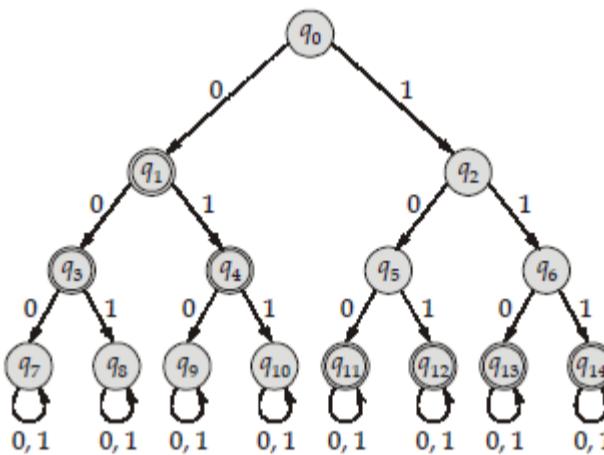
D

POQNMR

## QUESTION ANALYTICS

## Q. 13

Consider the following DFA in the form of a complete binary tree, having  $\Sigma = \{0, 1\}$  and has 15 states as shown below:



Let  $L(x)$  be the language accepted by the DFA if the starting state is  $q_2$ . Similarly let  $L(y)$  be the language accepted if starting state is  $q_1$ . Then the number of states in the minimal DFA accepting  $L(x) \cup L(y)$  will be equal to

[Have any Doubt?](#)

A

0

B

1

Correct Option

## Solution :

(b)

$$L(x) = \{w \mid w \in (0, 1)^*; |w| \geq 2\}$$

$$L(y) = \{w \mid w \in (0, 1)^*; |w| \leq 1\}$$

$$L(x) \cup L(y) = L[(0 + 1)^*]$$

Therefore we need only one state.

So answer will be option (b).

C

2

D

3

## QUESTION ANALYTICS

## Q. 14

In a 16-bit instruction the size of address field is 7 bits. The computer uses expanding opcode techniques. It has 2, two address instruction and 250 one address instruction. How many zero address instruction can be formulated.

[Have any Doubt?](#)

A

5120



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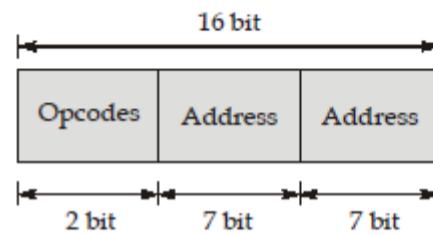
C

768

Correct Option

**Solution :**

(c)

**2-address instruction**

$$\text{Number of free opcodes} = 2^2 - 2 = 2$$

$$\text{Total number of one address instruction} = 2 \times 2^7 = 256$$

$$\text{Number of free opcodes} = (256 - 250) = 6$$

$$\text{Number of zero address instruction} = 6 \times 2^7 = 768$$

D

1024

QUESTION ANALYTICS

**Q. 15**

Consider two sorted arrays which are having sizes M and N. To combine those arrays into a single array then total comparisons and movements required respectively are

[Have any Doubt ?](#)

A

 $O(M^2)$  and  $O(M + N)$ 

B

 $O(M)$  and  $O(M + N)$ 

C

 $O(M + N)$  and  $O(N)$ 

D

 $O(M + N)$  and  $O(M + N)$ 

Correct Option

**Solution :**

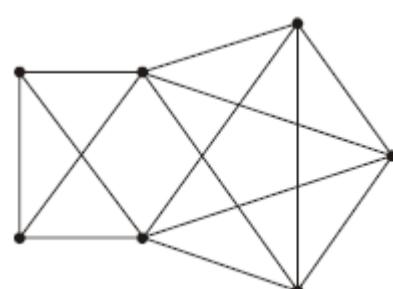
(d)

 The comparisons required in the worst case is  $O(M + N)$  using merge procedure. Similarly all  $(M + N)$  elements need to be moved in to new array using merge procedure.  
 Therefore movements are of  $O(M + N)$ .

QUESTION ANALYTICS

**Q. 16**

The vertex connectivity of the given graph is equal to

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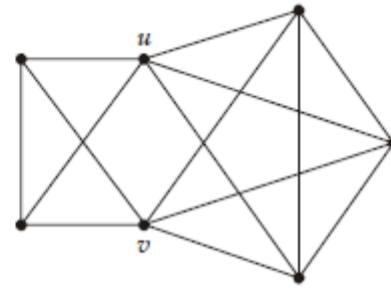
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B

2

Correct Option

**Solution :**  
 (b)


The above two vertices  $u$  and  $v$  shown in the figure when removed at the same time, disconnect the graph. So VC = 2.

C

3

D

None of these

QUESTION ANALYTICS

**Q. 17**

Consider the following statements:

 $S_1$  : Paging suffers flow external fragmentation. $S_2$  : Segmentation does not suffer from external fragmentation.

Which of the above is correct?

Have any Doubt ?

A

Only  $S_1$ 

B

Only  $S_2$ 

C

Both  $S_1$  and  $S_2$ 

D

None of the above

Correct Option

**Solution :**

(d)

 $S_1$  : Paging does not suffer from external fragmentation. $S_2$  : Segmentation suffers from external fragmentation.

QUESTION ANALYTICS

**Q. 18**Let  $f(A, B) = \bar{A} + \bar{B}$ , then the value of  $f(f(x + y, y), z) = ?$ 

Have any Doubt ?

A

 $\bar{y} + z$



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C

$$y + \bar{z}$$

Correct Option

**Solution :**

(c)

$$A = x + y$$

$$B = y$$

$$f(x + y, y) = (\overline{x + y}) + \bar{y} = \bar{x} \cdot \bar{y} + \bar{y}$$

So,

$$f(\bar{y}, z) = \bar{y} + \bar{z} = y + \bar{z}$$

D

$$\overline{y + z}$$

QUESTION ANALYTICS

**Q. 19**The best effort delivery services such as an **IP** does not include

Have any Doubt ?

A

error checking

B

datagram acknowledgment

C

error correction

D

All of these

Correct Option

**Solution :**

(d)

Option (a) : Error Checking is only for header part.

Option (b) : There is no acknowledgment for packets reaching the destination.

Option (c) : IP has minimal error control and there is no concept of error correction for IP datagram.

All the options are correct.

QUESTION ANALYTICS

**Q. 20**

Consider the following statements:

 $S_1$  : In an undirected simple graph in which each edge has distinct edge weight. If a cycle is encountered in the graph while MST construction then MST will contain each edge whose weight is minimum in any cycle. $S_2$  : In an undirected simple graph in which each edge has distinct edge weight. If a cycle is encountered in the graph while MST construction then MST will exclude each edge whose weight is maximum in any cycle.  
Which of the following is true?

Have any Doubt ?

A

Only  $S_1$ 

B

Only  $S_2$ 

Correct Option



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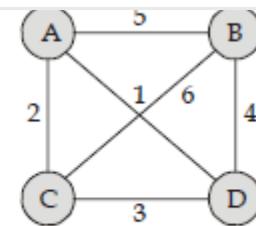
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Since '3' is minimum in cycle BCD but it can't be included in MST because it will create cycle.

- $S_2$  is true since every edge with maximum weight in any cycle must be excluded in MST construction.

C

Both  $S_1$  nor  $S_2$ 

D

Neither  $S_1$  nor  $S_2$ 

QUESTION ANALYTICS

**Q. 21**

If  $A^3 - 2A^2$  is singular then one of the eigen values of A is

A

2

Correct Option

**Solution :**

(a)

B

3

C

4

D

5

QUESTION ANALYTICS

**Q. 22**

Let  $(D_{n'}, /)$  be a Boolean Algebra where ' $/$ ' stands for the usual 'divides' relation. It is known that  $n = 5^p - r$ ,  $6^p + r$ ,  $7^r + q + 2s$ ,  $11^{q-2s+r}$ , for some  $p, q, r, s \in \mathbb{Z}$ . Then the value of the expression  $(2p + r + 2q + s)$  is equal to

A

256

B

49

C

4

Correct Option

**Solution :**

(c)



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$$\begin{aligned} p + r &= 1 \\ p - r &= 1 \\ q + r + 2s &= 1 \\ q + r - 2s &= 1 \end{aligned}$$

Solving these four equations, we get  $p = 1$ ,  $q = 1$ ,  $r = 0$ ,  $s = 0$   
 So the value of  $2p + q + 2r + s = 4$

 D  
 998

QUESTION ANALYTICS

**Q. 23**

Given relation R(A, B, C, D, E) with functional dependencies:

$$F = \{AB \rightarrow C, AB \rightarrow D, D \rightarrow A, BC \rightarrow D, BC \rightarrow E\}$$

What is the strongest normal form of relation R?

Have any Doubt?

 A  
 2 NF

 B  
 3 NF

Correct Option

**Solution :**

(b)

$$R(A, B, C, D, E)$$

$$F = \{AB \rightarrow C, AB \rightarrow D, D \rightarrow A, BC \rightarrow D, BC \rightarrow E\}$$

$$\text{Closure of } (AB)^+ = \{ABCDE\}$$

$$\text{Closure of } (BC)^+ = \{ABCDE\}$$

$$\text{Closure of } (BD)^+ = \{ABCDE\}$$

{AB, BC, BD} one keys of R

D  $\rightarrow$  A, A is prime attribute so it is in 3 NF but not in BCNF.
 C  
 BCNF

 D  
 None of the above

QUESTION ANALYTICS

**Q. 24**

Consider the following in the domain of integers.

$$P(x) = x = 2 \text{ or } x = 3$$

$$Q(x) = x \text{ is prime}$$

$$R(x) = x \text{ is even}$$

$$\text{I. } (R(x) \wedge Q(x)) \Rightarrow P(x)$$

$$\text{II. } P(x) \Rightarrow (R(x) \wedge Q(x))$$

Which of the above statements is valid?

Have any Doubt?

 A  
 I only

Correct Option



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II is false

B  
II onlyC  
III onlyD  
Neither I nor II

QUESTION ANALYTICS

**Q. 25**

The Boolean function can be expressed in canonical SOP and POS forms. So, for  $Y = A\bar{B} + B\bar{C}$ , the SOP and POS forms will be

[Have any Doubt ?](#)

A

$$Y = \Sigma (0, 2, 4, 6); Y = \pi (1, 3, 7)$$

B

$$Y = \Sigma (1, 2, 5, 7); Y = \pi (0, 3, 4, 6)$$

C

$$Y = \Sigma (2, 4, 5, 6); Y = \pi (0, 1, 3, 7)$$

**Correct Option****Solution :**

(c)

Plotting the K-map for  $Y = A\bar{B} + B\bar{C}$ 

		$\bar{B}\bar{C}$	$\bar{B}C$	$BC$	$B\bar{C}$	
		A	0	1	3	1 <sub>2</sub>
A	1 <sub>4</sub>	1 <sub>5</sub>	1 <sub>7</sub>	1 <sub>6</sub>		

So,

$$\Sigma m (2, 4, 5, 6) = \text{SOP}$$

$$\Sigma \pi (0, 1, 3, 7) = \text{POS}$$

D

$$Y = \Sigma (1, 2, 4, 5); Y = \pi (0, 3, 6)$$

QUESTION ANALYTICS

**Q. 26**

Consider a non-pipelined processor with a clock rate of 3 GHz and each instruction requires on an average 4 cycles. The same processor is upgraded to a pipelined processor with 8 stages, but due to the internal pipeline delay, the clock speed is reduced to 2 GHz. Assume that there are no stalls in the pipeline. The speed up achieved in this pipelined processor is \_\_\_\_\_. (Upto 2 decimal places)

[Have any Doubt ?](#)

2.66 (2.50 - 2.70)

**Correct Option****Solution :**

$$2.66 (2.50 - 2.70)$$

$$\text{Cycle time for non-pipelined setup} = \frac{1}{3} \text{ ns}$$



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$$\text{Speed up} = \frac{\text{Time without pipeline}}{\text{Time with pipeline}} = \frac{1.332}{0.5} = 2.664$$

## QUESTION ANALYTICS

## Q. 27

In the network 242.20.51.200/28, the fourth octet (in decimal) of the last IP address of the network which can be assigned to a host is \_\_\_\_\_.

[Have any Doubt?](#)

206

Correct Option

## Solution :

206

242.20.51.200/28

255.255.255.240

240 → 1111 0000

200 → 1100 1000

Network Id

First IP → 1100 0001

⋮

Last IP → 1100 1110

i.e. last IP is 242.20.51.206

∴ 206 is the fourth octet of the last IP address.

## QUESTION ANALYTICS

## Q. 28

Consider the matrix  $A = \begin{bmatrix} 2 & 1 & 1 \\ 2 & 3 & 4 \\ -1 & -1 & -2 \end{bmatrix}$  whose eigen values are 1, -1 and 3. Then trace of  $A^4 - 4A^3$  is \_\_\_\_\_.

[Have any Doubt?](#)

-25

Correct Option

## Solution :

-25

Eigen values of given matrix A are 1, -1, 3

Eigen values of  $A^4 = 1, 1, 81$ Eigen values of  $4A^3 = 4, -4, 108$ Eigen values of  $A^4 - 4A^3 = -3, 5, -27$ ∴ Trace of  $A^4 - 4A^3 = -3 + 5 - 27 = -25$ 

## QUESTION ANALYTICS

## Q. 29

Consider the following code segment:

 $P_0()$   
 {  
 P(S)  
 ⋮
 }

 $P_1()$   
 {  
 P(S)  
 ⋮
 }



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operation  $a$  and  $b$  are shared variable between  $P_0$  and  $P_1$ )The numbers of distinct values that  $a$  can possibly take after the execution when  $P_0$  and  $P_1$  both concurrently executing \_\_\_\_\_.[Have any Doubt ?](#)

2

Correct Option

**Solution :**

2

**If  $P_0$  is executed first then  $P_1$** 

$$a = 0 + 3$$

$$a = 3$$

$$a = 10 + 5$$

$$a = 15$$

**At the end of execution  $a$  can take 15****If  $P_1$  is executed first then  $P_0$ .**

$$a = 10 + 5$$

$$a = 15$$

$$a = 15 + 3$$

$$a = 18$$

 **$a$  can take 18****Total 2 different values.**

QUESTION ANALYTICS

**Q. 30**

Consider the following sets I, II, III and IV as follows:

- I.  $\{0, 1, 1, 1, 2, 2, 2, 2, 2\}$
- II.  $\{2, 0, 1\}$
- III.  $\{\{2\}, \{2\}, \{\{2\}\}, \{\{2\}\}\}$
- IV.  $\{2, \{2\}\}$

Let X, Y, Z, W denote the cardinality of the sets I, II, III and IV respectively. Then  $X + Y + Z + W$  will be equal to

10

Correct Option

**Solution :**

10

In a set, the order of the elements as well as repetition does not matter. So I and II both have cardinality 3. The set III has 2 distinct elements, i.e.  $\{2\}$  and  $\{\{2\}\}$  respectively. IV also has 2 elements namely, 2 and  $\{2\}$ . Therefore both III and IV have cardinality equal to 2 each.

So  $X + Y + Z + W = 3 + 3 + 2 + 2 = 10$ 

QUESTION ANALYTICS

**Q. 31**

Let T be a tree with 25 vertices. Then the sum of degrees of all vertices in T is equal to \_\_\_\_\_.

[Have any Doubt ?](#)

48

Correct Option

**Solution :**

48

Given,

$$n = 25$$

Since T has  $n - 1$  edges, therefore  $e = 25 - 1 = 24$ 

$$\text{Required degree sum} = 2e = 2 \cdot 24 = 48$$



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**Q. 32**

Consider the following statements:

 $S_1$  : A functional dependency  $X \rightarrow Y$  is allowed in 3NF iff X is a superkey and Y is prime attribute. $S_2$  : Every relation in relational model must be in 1NF. $S_3$  : Relational calculus is a non procedural language.

The number of correct statement are \_\_\_\_\_.

[Have any Doubt ?](#)

2

**Correct Option****Solution :**

2

 $S_1$ : A functional dependency  $X \rightarrow Y$  is allowed in 3NF iff X is a superkey or Y is prime attribute. $S_2$ : Every relation in relational model must be in 1NF and all other normal form are optional. $S_3$ : Relational calculus is a non procedural language.**QUESTION ANALYTICS****Q. 33**

Consider the following statements:

 $S_1$  : LR(1) grammar can be LR(0) but can not be LL(1). $S_2$  : Every regular language is LL(1). $S_3$  : Three address code is a linearized representation of syntax tree.

Which of the above statements are correct \_\_\_\_\_.

[Have any Doubt ?](#)

2

**Correct Option****Solution :**

2

 $S_1$ : Some LR(1) grammar can also be LL(1) grammar. $S_2$ : For every regular language there exist a regular grammar which is LL(1) so every regular language is LL(1). $S_3$ : Three address code is a linearized representation of syntax tree. $S_2$  and  $S_3$  is correct.**QUESTION ANALYTICS****Q. 34**

Max-heap is constructed by inserting the following integer in the order into an empty tree. The sum of minimum integer value present at every level of max heap tree \_\_\_\_\_.

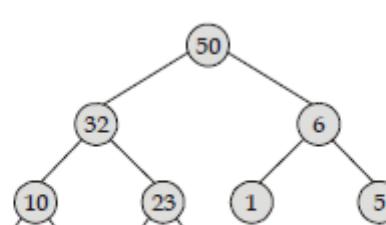
Input: 20, 32, 1, 3, 4, 5, 6, 7, 10, 23, 50

[Have any Doubt ?](#)

60

**Correct Option****Solution :**

60





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$$\begin{aligned} \min_2 &= \text{Minimum element present at 2 level} = 1 \\ \min_3 &= \text{Minimum element present at 3 level} = 3 \\ \text{Sum} &= \min_0 + \min_1 + \min_2 + \min_3 \\ &= 50 + 6 + 1 + 3 = 60 \end{aligned}$$

## QUESTION ANALYTICS

## Q. 35

Consider the following function:

```
void madeeasy (int n)
{
    if (n < 0) return;
    else
    {
        printf(n);
        madeeasy (- -n);
        madeeasy (n - -);
        printf(n);
    }
}
```

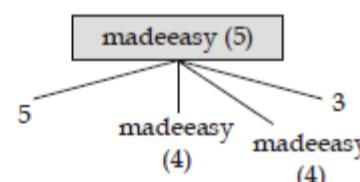
The sum of all values printed by madeeasy (5) \_\_\_\_\_.

[Have any Doubt ?](#)[Correct Option](#)

52

## Solution :

52



$$\begin{aligned} \text{madeeasy (1)} &= 1 - 1 = 0 \\ \text{madeeasy (2)} &= 2 + 0 + 0 + 0 = 2 \\ \text{madeeasy (3)} &= 3 + 2 + 2 + 1 = 8 \\ \text{madeeasy (4)} &= 4 + 8 + 8 + 2 = 22 \\ \text{madeeasy (5)} &= 5 + 22 + 22 + 3 = 52 \end{aligned}$$

## QUESTION ANALYTICS

## Q. 36

An array 'S' contain n distinct elements. Consider a function ' $f_i$ ' which is defined as:

$$f_i = \{\max(a, b, c) \mid \forall_{a, b, c} \in S \text{ and } a \neq b \neq c\}$$

What is the worst case time complexity to find set of all possible elements which are returned by function ' $f_i$ ' when array 'S' is passed as an argument?[Have any Doubt ?](#)[Correct Option](#)

A

 $O(n)$ 

## Solution :

(a)

If we observe there are " $C_3$ " sets of 3-elements possible. Out of  $n$  elements only 2-smallest elements cannot be present in "max-element set". So we can use 2-pass of selection sort to find 2-smallest elements. Other than these two elements all will be present in "max-element set". So it will



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 B  
 $O(n \log n)$ 

 C  
 $O(n^2)$ 

 D  
 $O(n^3)$ 

QUESTION ANALYTICS

**Q. 37**

Consider an error-free 64-Kbps satellite channel used to send 512-byte data frames in one direction, with very short acknowledgments coming back the other way. Assume the earth-satellite propagation time is 270 msec. What is the minimum window size so that the channel is fully utilized?

[Have any Doubt ?](#)

A

1

B

7

C

10

Correct Option

**Solution :**

(c)

$$\begin{aligned} T_p &= 270 \text{ msec} \\ \text{R.T.T.} &= 2 \times T_p \\ &= 540 \text{ msec} \end{aligned}$$

$$\begin{array}{rcl} 10^3 \text{ msec} & \_\_ & 64 \text{ KB} \\ 540 \text{ msec} & \_\_ & ? \end{array}$$

$$= \frac{64 \text{ KB}}{10^3} \times 540$$

$$540 \text{ msec} = 34560 \text{ bit}$$

$$\text{Number of frames in } 540 \text{ msec} = \frac{34560 \text{ bit}}{512 \times 8 \text{ bit}} = \lceil 8.43 \rceil = 9$$

So to fully utilized minimum size of window = 9  
 Hence option (c) is more close matching.

D

15

QUESTION ANALYTICS

**Q. 38**

The number of vertices, edges and colors required for proper coloring in the tripartite graph  $K_{3,2,5}$  will be

[Have any Doubt ?](#)

A

10, 31 and 3 respectively

Correct Option

**Solution :**

(a)



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B  
 10, 30 and 2 respectively

C  
 10, 30 and 3 respectively

D  
 None of the above

QUESTION ANALYTICS

## Q. 39

Consider the following snapshot of three processes in the system.

Process	Allocated			Remaining Need		
	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>
P <sub>1</sub>	2	1	0	1	0	0
P <sub>2</sub>	2	3	2	0	1	1
P <sub>3</sub>	0	0	1	0	0	1

 Assume R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> has 4, 4 and 5 instances respectively available before the above allocations. Which of the following options is correct ?
[Have any Doubt ?](#)

A  
 System is in safe state and P<sub>1</sub> process will finish the execution last

B  
 System is in safe state and P<sub>2</sub> process will finish the execution last

C  
 System is not in safe state

Correct Option

**Solution :**  
 (c)

Process	Allocated			Remaining Need		
	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>
P <sub>1</sub>	2	1	0	1	0	0
P <sub>2</sub>	2	3	2	0	1	1
P <sub>3</sub>	0	0	1	0	0	1

$$\begin{array}{r}
 R_1 \quad R_2 \quad R_3 \\
 \text{Total} = (4 \quad 4 \quad 5) \\
 \text{Allocated} \quad (4 \quad 4 \quad 3) \\
 \hline
 \text{Available} \quad (0, 0, 2)
 \end{array}$$

By this available instance of resources only the need of P<sub>3</sub> can be fulfilled. Hence P<sub>3</sub> will be executed and available resources [0 0 1] + [0 0 2] = [0 0 3]

Now, no process can execute further and hence, system is not in safe state.

D  
 None of these

QUESTION ANALYTICS

## Q. 40



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A  
10B  
11

Have any Doubt ?

Correct Option

**Solution :**

(b)

Order of  $B^+$  tree internal node is P

$$P \times 10 + (P - 1) 14 \leq 1024$$

$$10P + 14P - 14 \leq 1024$$

$$24P \leq 1038$$

$$P \leq 43.25$$

$$P \leq 43$$

Order of B tree is Q

$$Q \times 10 + (Q - 1) (14 + 8) \leq 1024$$

$$10Q + (Q - 1) 22 \leq 1024$$

$$10Q + 22Q \leq 1024 + 22$$

$$32Q \leq 1046$$

$$Q \leq 32$$

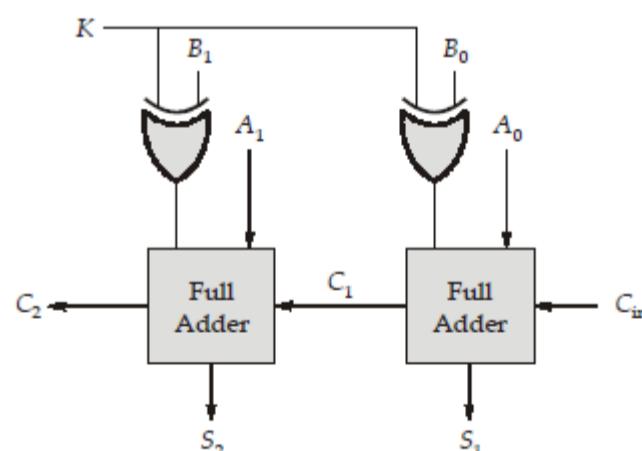
$$P - Q = 43 - 32 = 11$$

C  
12D  
13

QUESTION ANALYTICS

**Q. 41**

Assume the operands A and B are available in 2's complement representation. To decrement A by 1 lines K,  $C_{in}$  and B should be



Have any Doubt ?

A

$$K = 1, C_{in} = 1, B = 1$$

B

$$K = 0, C_{in} = 1, B = 1$$

C

$$K = 0, C_{in} = 1, B = 0$$

D

$$K = 1, C_{in} = 0, B = 0$$

Correct Option



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K	C <sub>0</sub>	B	Operations
0	0	B	A + B (addition)
0	1	B	A + B + 1 (addition with carry)
0	1	0	A + 1 (increment)
1	0	B	A + B (1's complement addition)
1	1	B	A + B + 1 (2's complement subtraction)
1	0	0	A - 1 (decrement)

## QUESTION ANALYTICS

## Q. 42

A computer on a 10-Mbps network is regulated by a token bucket. The token bucket is filled at a rate of 2 Mbps. It is initially filled to capacity with 20 Megabits. How long can the computer transmit at the rate of 10 Mbps (in seconds) upto two decimal places?

Have any Doubt ?

A

2.5 sec

Correct Option

## Solution :

(a)

Burst length of computer is given by

$$S = \frac{C}{M - e}$$

Bucket capacity  
Output rate      Bucket fill rate

$$S = \frac{20 \times 10^6}{10 \times 10^6 - 2 \times 10^6} = 2.5 \text{ seconds}$$

B

3 sec

C

4 sec

D

3.5 sec

## QUESTION ANALYTICS

## Q. 43

The number of distinct subwords possible for the word 'LAPPEELLAAN' is

Have any Doubt ?

A

59

Correct Option

## Solution :

(a)

1 letter subwords: (L, A, P, E, N) = 5

2 letter subwords: (LA, AP, PP, PE, EE, EL, LL, AA, AN) = 9

3 letter subwords: (LAP, APP, PPE, PEE, EEL, ELL, LLA, LAA, AAN) = 9

4 letter subwords: (LAPP, APPE, PPEE, PEEL, EELL, ELLA, LLAA, LAAN) = 8

5 letter subwords = 7

6 letter subwords = 6



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$$= 14 + \frac{9 \times 10}{2} = 59$$

 B  
 26

 C  
 32

 D  
 48

## QUESTION ANALYTICS

**Q. 44**

Consider the following code:

```
int P = 0;
for (i = 1; i < 2n; i++)
{
    for (j = 1, j<=n; j++)
    {
        if (j < i) P = P + 1;
    }
}
printf("%d", P);
```

What is the output printed by the above code in terms of  $n$ ?
[Have any Doubt ?](#)


A

$$\frac{4n^2 - n}{2}$$

B

$$\frac{3n^2 - n}{2}$$

Correct Option

Solution :

(b)

$$\begin{aligned}
 \sum_{i=1}^{2n} \sum_{j=1}^n 1 - \sum_{j=1}^n j &= \sum_{i=1}^{2n} n - \frac{n(n+1)}{2} \\
 &= 2n^2 - \frac{n^2}{2} - \frac{n}{2} = \frac{3}{2}n^2 - \frac{n}{2} = \frac{3n^2 - n}{2}
 \end{aligned}$$

C

$$\frac{n^2 - 4n}{2}$$

D

$$\frac{n^2 - 3n}{2}$$

## QUESTION ANALYTICS



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FOR RUMBLE SORT:

**RumbleSort(L):**

```

let sorted = false
while not sorted:
    sorted = true
    for i: = 0; i < len(L) - 2; i++:
        if L[i] > L[i + 2]:
            sorted = false
            reverse the given list from L[i] to L[i + 2] (inclusive)
  
```

With regards to the above Rumble Sort algorithm, consider the following statements.

 $S_1$  : RumbleSort works correctly for all inputs. $S_2$  : The time complexity of determining if the RumbleSort algorithm will work correctly for a given input is  $O(n^2)$ .

Which of the above statements is/are true?

Have any Doubt ?

A

Both  $S_1$  and  $S_2$ 

B

Only  $S_1$ 

C

Only  $S_2$ 

D

None of these

Correct Option

**Solution :**

(d)

Both are false statements.

**Justification:**

RumbleSort is actually Bubble Sort being applied separately to odd and even positions. We see the way the element comparisons are done as follows.

Element 0 - Element 2

Element 1 - Element 3

Element 2 - Element 4

Element 3 - Element 5

Element 4 - Element 6

And so on. And it can be seen that (even, odd) and (odd, even) positions are never compared. Hence we can conclude that RumbleSort gives two sorted sublists, such that one sublist which contains elements at even positions is sorted, as well as the other sublists containing elements at odd positions is also sorted.

Hence,  $S_1$  is clearly false.Now since we know how the algorithm works, the algorithm actually sorts the odd and even sublists separately. Hence we can mimic the action of this algorithm by using the best sorting technique which takes  $O(n \log n)$  time to sort the odd and even positions separately first. And check if the given array is sorted takes  $O(n)$ . Hence overall time complexity to check if the algorithm will work correctly for a given input, is  $O(n \log n)$  - thus  $S_2$  is also false.

QUESTION ANALYTICS

**Q. 46**

Consider the following schedule

 $S : R_1(x), R_2(x), W_2(x), W_3(y), W_3(x), R_1(z), W_1(x)$ (Where  $R(x)$ ,  $W(x)$  are read, write operation on data item  $x$ )

Which of the following is true about the above schedule?

Have any Doubt ?

A



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Only view serializable

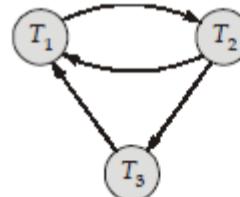
C  
 Both conflict and view serializable

D  
 None of the above

Correct Option

Solution :

(d)



Precedence graph of S contain cycle so not conflict serializable.

For view serializable

Final write:  $x = T_1, y = T_3$ Initial read:  $x = T_1, T_2, y = T_3, z = T_1$ 

Write read conflict

$$(T_2, T_3) \rightarrow T_1 \\ T_1 \rightarrow T_2, T_3$$

It is not possible at same time.

So not view serializable.

QUESTION ANALYTICS

**Q. 47**

Consider a micro program control unit and list of corresponding properties in control unit design:

**Micro program control unit**

- P. Horizontal  $\mu$  Control unit  
 Q. Vertical  $\mu$  Control unit

**Properties**

1. Control signals are in decoded binary format
2. Control signals are in encoded binary format
3. Shorter Control Word
4. Longer Control Word
5. Low degree of parallelism
6. High degree of parallelism

Which of the following is the correct match between the Micro program control unit and their properties?

Have any Doubt ?

A

(P-1, 4, 6) and (Q-2, 3, 5)

Correct Option

Solution :

(a)

- In **Horizontal  $\mu$  Control unit** design Control signals are in decoded binary format, Longer Control Word and High degree of parallelism.
- In **Vertical  $\mu$  Control unit** design Control signals are in encoded binary format, Shorter Control Word and Low degree of parallelism.

B

(P-1, 4, 5) and (Q-2, 3, 6)

C

(P-2, 4, 6) and (Q-1, 3, 5)

D

(P-2, 3, 6) and (Q-1, 4, 5)



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**Q. 40**

Consider the following grammar G:

$$\begin{aligned} S &\rightarrow aA \mid CB \\ A &\rightarrow BaA \mid \epsilon \\ B &\rightarrow bB \mid AaC \mid \epsilon \\ C &\rightarrow B \end{aligned}$$

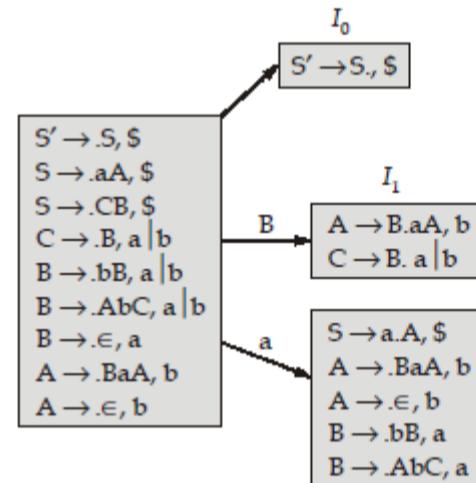
Which of the following is true about the above grammar?

[Have any Doubt ?](#) A  
LL(1) and LR(0)B  
Not in LL(1) but LR(0)C  
Only SLR(1)D  
Not LL(1) and SLR(1)

Correct Option

**Solution :**

(d)

While constructing DFA parser we see  $I_1$  has S-R conflict.

For SLR      Follow(C) = {b, a, \$}

$$\begin{aligned} \{a\} \cap \{b, a, \$\} \\ = \{a\} \end{aligned}$$

It is not in SLR(1) and LR(0).

For LL(1)

In the S production

$$\begin{aligned} \text{First}(aA) \cap \text{First}(CB) \\ \{a\} \cap \{b, \epsilon, a\} \\ \{a\} \neq \emptyset \end{aligned}$$

So it is not in LL(1).

QUESTION ANALYTICS

**Q. 49**

Consider the following linear system:

$$\begin{aligned} x + 2y - 3z &= c \\ 2x + 3y + 3z &= b \\ 5x + 9y - 6z &= a \end{aligned}$$

This system is consistent if  $a, b$  and  $c$  satisfy the equation[Have any Doubt ?](#) A  
 $7a - b + c = 0$



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C  
 $7a + b + c = 0$

D  
 $a - 3c - b = 0$

Correct Option

**Solution :**

(d)

Given,  $[A : B] = \left[ \begin{array}{ccc|c} 1 & 2 & -3 & c \\ 2 & 3 & 3 & b \\ 5 & 9 & -6 & a \end{array} \right]$

$$\begin{aligned} R_2 &\rightarrow R_2 - 2R_1 \\ R_3 &\rightarrow R_3 - 5R_1 \\ &= \left[ \begin{array}{ccc|c} 1 & 2 & -3 & c \\ 0 & -1 & 9 & b - 2c \\ 0 & -1 & 9 & a - 5c \end{array} \right] \\ R_3 &\rightarrow R_3 - R_2 \\ &= \left[ \begin{array}{ccc|c} 1 & 2 & -3 & c \\ 0 & -1 & 9 & b - 2c \\ 0 & 0 & 0 & a - 3c - b \end{array} \right] \end{aligned}$$

For consistency of system  $a - 3c - b = 0$ 

## QUESTION ANALYTICS

**Q. 50**

Assume that the following values are inserted into binary search tree in the given order: 40, 50, 70, 20, 30, 10, 60, 90, 80, 100. Consider the following function:

```
void find (Node * root)
{
    if (root == NULL) return;
    find (root → left);
    find (root → right);
    printf ("%d", root → data);
}
struct node
{
    int data;
    struct node * left;
    struct node * right;
} Node;
```

Find the output printed by the above function, if the root of the binary search tree is passed to the "tree" function.

Have any Doubt ?

A  
 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

B  
 30, 20, 10, 60, 80, 100, 90, 70, 50, 40

C  
 10, 30, 20, 60, 80, 100, 90, 70, 50, 40

Correct Option

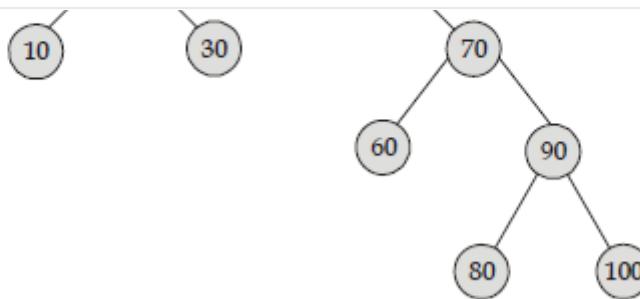
**Solution :**

(c)

Binary search tree of given sequence is



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The given function perform post order traversal on the binary search tree.  
 So output is 10, 30, 20, 60, 80, 100, 90, 70, 50, 40.

D

30, 20, 100, 80, 90, 60, 70, 50, 10, 40

[QUESTION ANALYTICS](#)**Q. 51**

Consider the following languages M and N.

$$M = \{ww^Rww^R \mid w \in \{0, 1\}^*\}$$

$$N = \{w_1w_1^Rw_2w_2^R \mid w \in \{0, 1\}^*\}$$

Then which of the above languages are CFLs?

[Have any Doubt ?](#)

A

Both M and N

B

Only M

C

Only N

**Correct Option****Solution :**

(c)

M will be a CSL and N will be context free.

Therefore option (c) is the answer.

D

None of these

[QUESTION ANALYTICS](#)**Q. 52**

Consider 4 stage instruction pipeline executed on a system:

	$S_1$	$S_2$	$S_3$	$S_4$
$I_1$	1	3	1	1
$I_2$	2	1	2	1
$I_3$	1	2	1	2
$I_4$	2	1	2	1

If all instructions are executed only once, what is the throughput of system?

[Have any Doubt ?](#)

A

$$\frac{4}{9} \text{ cycles}$$



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C

$$\frac{4}{12} \text{ cycles}$$

D

$$\frac{4}{11} \text{ cycles}$$

Correct Option

Solution :

(d)

	$c_1$	$c_2$	$c_3$	$c_4$	$c_5$	$c_6$	$c_7$	$c_8$	$c_9$	$c_{10}$	$c_{11}$
$S_4$						$I_1$		$I_2$	$I_3$	$I_3$	$I_4$
$S_3$					$I_1$	$I_2$	$I_2$	$I_3$	$I_4$	$I_4$	
$S_2$		$I_1$	$I_1$	$I_1$	$I_2$	$I_3$	$I_3$	$I_4$			
$S_1$	$I_1$	$I_2$	$I_2$		$I_3$	$I_4$	$I_4$				

$$\begin{aligned} \text{Throughput} &= \frac{\text{Number of task completed}}{\text{Total time taken to process the tasks}} \\ &= \frac{4}{11} \text{ cycles} \end{aligned}$$

QUESTION ANALYTICS

Q. 53

If TCP round trip time RTT is currently 20 millisec and the following acknowledgments come in after 22, 24 and 23 millisec respectively, what is new RTT estimate? ( $\alpha = 0.9$ )

Have any Doubt ?

A

28.527

B

28.82

Correct Option

Solution :

(b)

$$\begin{aligned} \text{I.R.T.T} &= 20 \text{ ms} \\ \text{N.R.T.T} &= 22 \text{ ms} (\alpha = 0.9) \\ \text{E.R.T.T} &= \alpha \times \text{I.R.T.T} + (1 - \alpha) \times \text{N.R.T.T} \\ &= 0.9 \times 20 + 0.1 \times 22 = 20.2 \text{ ms} \\ \text{I.R.T.T} &= 20.2 \text{ ms} \\ \text{N.R.T.T} &= 24 \text{ ms} \\ \text{E.R.T.T} &= 0.9 \times 20.2 + 0.1 \times 24 = 20.58 \text{ ms} \\ \text{I.R.T.T} &= 23.58 \text{ ms} \\ \text{N.R.T.T} &= 23 \text{ ms} \\ \text{E.R.T.T} &= 0.9 \times 23.58 + 0.1 \times 23 \\ &= 20.82 \text{ ms} \end{aligned}$$

C

29.527

D

None of these

QUESTION ANALYTICS



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 Consider the following instance of boolean matrix M of order  $4 \times 5$ .

False	True	False	True	False
False	False	True	False	False
False	True	True	True	False
True	True	True	True	True

Each entry  $M[i, j]$  is assigned either true or false. Also assume that the rows are indexed from 1 to 4 and columns are indexed from 1 to 5 in the matrix. Now consider the following predicate logic statements over the matrix M.

- I.  $\forall i \forall j [(i + j = 3) \Rightarrow (M[i, j] = \text{true})]$
- II.  $\forall i \exists j [M[i, j] = \text{false}]$
- III.  $\exists i \forall j [M[i, j] = \text{true}]$

The number of the above statements hold true for the above matrix instance M is \_\_\_\_\_.

1

Correct Option

**Solution :**

1

I says if  $(i + j = 3) \Rightarrow (M[i, j] = \text{true})$ ,  $M[1, 2]$  and  $M[2, 1]$  are both satisfies  $(i + j = 3)$  and  $M[1, 2]$  is true but  $M[2, 1]$  is false. So I is false  
 III is the easiest to start with. It says "there's a row such that all the entries in that row are true". The last row satisfies this claim hence III is true.  
 II says "Every row has at least one entry which is false" which is not true, as the last row has all the entries true. Also, II is actually the negation of III if you notice clearly. So III being true means II false implicitly.

QUESTION ANALYTICS

**Q. 55**

The length of the shortest string not in the language generated by the regular expression  $r = (1 + 01)^*00(1 + 10)^* + (1 + 01)^*(0 + \epsilon)$  over  $\{0, 1\}$  is equal to \_\_\_\_\_.

3

Correct Option

**Solution :**

3

We have two ways to solve this, the first way being, check every string starting from 0 length until it is generated by the regular expression or not.  
 But if we observe the regular expression carefully,  $r$  is actually broken into two parts.  
 $= (\text{Exactly 1 pair of consecutive zeroes}) + (\text{No pair of consecutive zeroes})$   
 $= (\text{At most 1 pair of consecutive zeroes})$   
 So if we can recognize the language, we already know that the shortest string not generated by the language will be the shortest string having more than one pair of consecutive 0's and it is none other than 000. So the length will be equal to 3.

QUESTION ANALYTICS

**Q. 56**

In a RSA cryptosystem, a participant uses two prime number  $p$  and  $q$  is 11 and 13 respectively. If the public key is 7 then the private key in this cryptosystem is \_\_\_\_\_.



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[Note: Trick here is to check multiple of 7 is  $120 \times 1 + 1, 120 \times 2 + 1, 120 \times 3 + 1.....$  and so on]

## QUESTION ANALYTICS

## Q. 57

Consider a computer system with three processes A, B, C using SRTF scheduling algorithm. The process 'A' is known to be scheduled first, where 'A' has been running for '9' units of time, then the process 'B' has arrived. The process 'B' has run for '3' units of time, then the process 'C' has arrived and completed running in '4' units of time, then what could be the minimum burst time of process 'A' \_\_\_\_\_.

18

Correct Option

**Solution :**  
 18

$$\begin{aligned} A &\rightarrow 9 + 9 = 18 \\ B &\rightarrow 3 + 5 = 8 \\ C &\rightarrow 4 \end{aligned}$$

## QUESTION ANALYTICS

## Q. 58

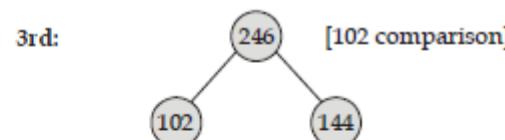
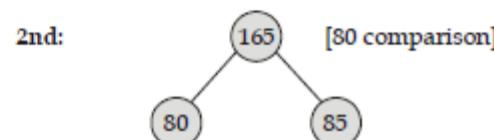
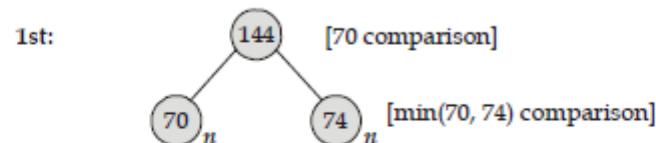
Let A, B, C, D, E are sorted sequences having length 70, 74, 80, 85, 102 respectively. They are merged into a single sequence by merging together two sequences at a time. The minimum number of comparison that will be needed by best algorithm for doing merging is \_\_\_\_\_.

417

Correct Option

**Solution :**  
 417

Given file size: 70, 74, 80, 85, 102 create min heap.

 Algorithm: Take 1<sup>st</sup> 2 min element, merge it, and put back result into heap, again find next two element, merge them, repeat until one element left.


At last: 411 [165 comparison]



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QUESTION ANALYTICS
**Q. 59**

Consider a system with main memory access time is 150 ns and page fault service time is 5  $\mu$ s, if one page fault is generated for every  $10^3$  memory access what is the effective memory access time \_\_\_\_\_ (in ns). (Upto 2 decimal places)

[Have any Doubt ?](#)


154.85 (154.82 - 154.86)

[Correct Option](#)
**Solution :**

154.85 (154.82 - 154.86)

Let P is the page fault rate Effective Access Time =  $(1 - P) \times \text{Memory access time} + P \times \text{Page f service time}$

$$\begin{aligned}
 &= \left(1 - \frac{1}{10^3}\right) \times 150 \text{ ns} + \frac{1}{10^3} \times 5 \times 10^3 \text{ ns} \\
 &= 0.999 \times 150 = 149.85 + 5 \\
 &= 154.85 \text{ ns}
 \end{aligned}$$

QUESTION ANALYTICS
**Q. 60**

A determinant of the second order is made with the element 0 and 1. The probability that the determinant made is non negative is \_\_\_\_\_. (Upto 2 decimal places)

[Have any Doubt ?](#)


0.81 (0.70 - 0.90)

[Correct Option](#)
**Solution :**

0.81 (0.70 - 0.90)

Let S be the sample space,

then,  $n(S) = \text{Total number of determinants that can be made with 0 and 1}$   
 $= 2 \times 2 \times 2 \times 2 = 16$

$\therefore \begin{vmatrix} a & b \\ c & d \end{vmatrix}$ ; each element can be replaced by two types i.e. 0 and 1 only}

and let E be the event that the determinant made is non negative also  $E'$  be the event that determinant is negative.

$$\therefore E' = \left\{ \begin{vmatrix} 1 & 1 \\ 1 & 0 \end{vmatrix}, \begin{vmatrix} 0 & 1 \\ 1 & 1 \end{vmatrix}, \begin{vmatrix} 0 & 1 \\ 1 & 0 \end{vmatrix} \right\}$$

$$\therefore n(E') = 3$$

$$\text{then } P(E') = \frac{n(E')}{n(S)} = \frac{3}{16}$$

Hence, the required probability,

$$P(E) = 1 - P(E') = 1 - \frac{3}{16} = \frac{13}{16} = 0.81$$

QUESTION ANALYTICS



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Nodes present in each binary tree of height n = \_\_\_\_\_.

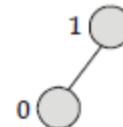
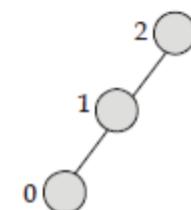
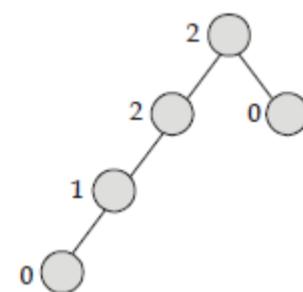
Have any Doubt? |

9

Correct Option

**Solution :**

9

For height ( $h = 1$ ) minimum number of node is 2 by using formula  $2^{h-1} + 1$  i.e.For height ( $h = 2$ ) minimum number of node is 3 by using formula  $2^{h-1} + 1$  i.e.For height ( $h = 3$ ) minimum number of node is 5 by using formula  $2^{h-1} + 1$  i.e.So for height ( $h = 4$ ) minimum number of node will be 9 by using formula  $2^{h-1} + 1$ .

QUESTION ANALYTICS

**Q. 62**

Consider the following relations:

ENo	Sname
2	Arun
3	Rahul
5	Vinay
8	Rahul
9	Arun

Student

ENo	Course	Grade
2	OS	80
3	CN	55
2	DBMS	65
5	CO	85
8	OS	70
5	DBMS	68
8	OS	52
9	CO	65

Enroll

Consider the following SQL query:

```
SELECT S.sname, sum (E.Grade) FROM Student S Enroll E WHERE S.ENo = E.ENo GROUP BY S.sname
```

The number of tuples returned by the SQL query is \_\_\_\_\_.

Have any Doubt? |

3

Correct Option

**Solution :**

3

SQL query group the tuples by Sname, in the student relation there is 3 group of Sname (A, Rahul, Vinay)

Relation returned by the SQL query

Sname	Grade
Arun	210
Rahul	177
Vinay	153



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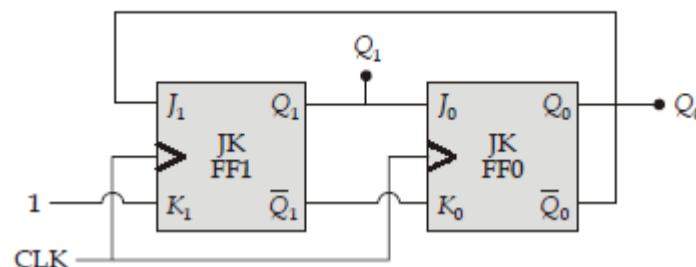
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## QUESTION ANALYTICS

## Q. 63

If the initial state of counter  $(Q_1\ Q_0) = (00)$  of the given figure. Then the modulus of the counter is \_\_\_\_\_.



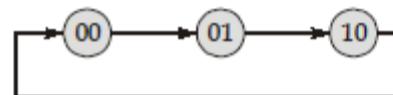
3

Correct Option

Solution :

3

		FF1		FF0	
CLK	$Q_1\ Q_0$	$J_1 = \bar{Q}_0\ K_1 = 1$	$J_0 = Q_1\ K_0 = \bar{Q}_1$		
	0 0	1 1	0 1		
1	1 0	1 1	1 0		
2	0 1	0 1	0 1		
3	0 0	1 1	1 0		



Modulus of counter = 3

## QUESTION ANALYTICS

## Q. 64

Consider the following statements:

S<sub>1</sub> : If a grammar G be LL(1) then it will not left recursive and not left factored.

S<sub>2</sub> : Consider the grammar G:

$$\begin{aligned} S &\rightarrow AB \mid ba \\ A &\rightarrow abA \mid B \\ B &\rightarrow bB \mid Aa \mid e \end{aligned}$$

It contain left recursion.

How many number of statements are correct \_\_\_\_\_.

1

Correct Option

Solution :

1

S<sub>1</sub> : If a grammar G be LL(1) then it will not left recursive and left factored. S<sub>1</sub> is not correct

S<sub>2</sub> : S → AB | ba

$$A \rightarrow abA \mid B$$

$$B \rightarrow bB \mid Aa \mid e$$

In the production A → B and B → Aa then it will become A → Aa so it contain left recursion

## QUESTION ANALYTICS

## Q. 65

Consider the following statements:



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2

Correct Option

**Solution :**

2

- I. Larger blocks reduce compulsory misses by improving spatial locality. So, this statement is correct.
- II. Higher associativity reduces conflict misses. A direct mapped cache of size N has the same miss rate as a 2-way cache of size  $N/2$ . So, this statement is correct.
- III. Conflict misses in fact will increase by increasing block size because there will be less number of lines. So, this statement is incorrect.

QUESTION ANALYTICS