



Kunal Jha

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Computer Science Engineering(CS)

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FULL SYLLABUS TEST-2 (BASIC LEVEL) GATE 2020 - REPORTS

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ALL(65)

CORRECT(0)

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Q. 1

Solution Video

Have any Doubt?



Which of the following most logically completes the argument below?

Within the earth's core, which is iron, pressure increases with depth. Because the temperature at which iron melts increases with pressure, the inner core is solid and the outer core is molten. Physicists can determine the melting temperature of iron at any given pressure and the pressure for any given depth in the earth. Therefore, the actual temperature at the boundary of the earth's outer and inner cores – the melting temperature of iron there – can be determined, since_____.

A The depth beneath the earth's surface of the boundary between the outer and inner cores is known

Correct Option

Solution :

(a) If physicists know the depth of the boundary between the inner and outer cores, they can determine the temperature at the boundary.

B Some of the heat from the earth's core flows to the surface of the earth**C** Pressures within the earth's outer core are much greater than pressures above the outer core**D** Nowhere in the earth's core can the temperature be measured directly

QUESTION ANALYTICS



Q. 2

Solution Video

Have any Doubt?

Pick out the most effective word from the given words to fill in the blank to make the sentence meaningfully complete.
Once you suspect a person of double dealing, you ought to keep him at arm's_____.**A** distance**B** length

Correct Option

Solution :

(b)

C aim**D** width

QUESTION ANALYTICS



Q. 3

Solution Video

Have any Doubt?



Read the sentence to find out whether there is any grammatical error in it. The error, if any will be in one part of the sentence. The letter of that part is the answer. If there is no error, the answer is (d). (Ignore the errors of punctuation, if any).

A The students were**B** awaiting for

Correct Option

Solution :

(b)

'awaiting for' should be replaced with 'awaiting' or 'waiting for'.

C the arrival of the chief guest.**D** No error

QUESTION ANALYTICS



Q. 4

Solution Video

Have any Doubt?



A 4 letter code word consists of letters A, B, and C. If the code includes all the three letters, how many such codes are possible?

A 72**B** 48

C 36

Correct Option

Solution :

(c)

As code must include all the three letters then pattern of the code word is ABCX where X can be any letter out of A, B, and C. So we can have the code word consisting of letters:

ABCA;

ABCB;

ABCC.

We can arrange letters in each of above 3 cases in $\frac{4!}{2!}$ number of ways (as each case has 4 letters

out of which one is repeated twice), so total number of code words is $3 \times \frac{4!}{2!} = 36$.

D 24

QUESTION ANALYTICS

+

Q. 5

▶ Solution Video

⌚ Have any Doubt ?

🔗

If the sum of the consecutive integers from -42 to n inclusive is 372, the value of n is _____

C 50

Correct Option

Solution :

50

42 terms after zero and 42 terms below will total 0. So, the question becomes : consecutive integers with first term 43 have sum 372, what is the last term :

$$\frac{43+n}{2} \times (n-43+1) = 372$$

$$(n+43) \times (n-42) = 744$$

$$\Rightarrow n = 50$$

QUESTION ANALYTICS

+

Q. 6

▶ Solution Video

⌚ Have any Doubt ?

🔗

If after 200 grams of water were added to the 24% solution of alcohol, the strength of the solution decreased by one-third, how much of the 24% solution was used?

A 180 grams

B 220 grams

C 250 grams

D 400 grams

Correct Option

Solution :

(d)

Let the weight of 24% solution used be x grams, weight of alcohol in it would be $0.24x$.

As in final solution strength decreased by $\frac{1}{3}$ thus it became $24 \times \frac{2}{3} = 16\%$.

Set the equation : $0.24x = 0.16(x + 200)$, the weight of 16% alcohol in $(x + 200)$ grams of new solution comes only from (equal to) 24% alcohol in x grams of strong (initial) solution, as there is 0 grams of alcohol in water (0% alcohol solution)

$$\Rightarrow 0.08x = 32$$

$$\Rightarrow x = 400$$

QUESTION ANALYTICS

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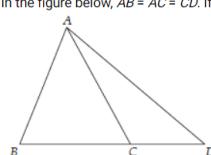
Q. 7

▶ Solution Video

⌚ Have any Doubt ?

🔗

In the figure below, $AB = AC = CD$. If $ADB = 20^\circ$, what is the value of BAD ?



A 40°

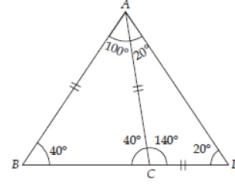
B 60°

C 70°

D 120°

Correct Option

Solution :
(d)



$AB = AC = CD \Rightarrow \angle CAD = \angle CDA = 20^\circ$
and $\angle ABC = \angle ACB$
In $\triangle ACD$
 $\Rightarrow \angle ACD + \angle CAD + \angle CDA = 180^\circ$
 $\Rightarrow \angle ACD = 180^\circ - 20^\circ - 20^\circ = 140^\circ$
 $\Rightarrow \angle ACB = 180^\circ - 140^\circ = 40^\circ = \angle ABC$
Similarly in $\triangle ABC$
 $\Rightarrow \angle BAC = 180^\circ - 40^\circ - 40^\circ = 100^\circ$
 $\therefore \angle BAD = 100^\circ + 20^\circ = 120^\circ$

QUESTION ANALYTICS

+

Q. 8

▶ Solution Video

⌚ Have any Doubt ?

🔍

The difference between the area of the circumscribed circle and the area of the inscribed circle of an equilateral triangle is 2156 sq.cm. What is the area of the equilateral triangle?

A $686\sqrt{3}$ sq.cm.

Correct Option

Solution :
(a)

Let radius of in circle = $r \Rightarrow$ Radius of circumcircle = $2r$
Difference in area = $\pi[(2r)^2 - (r)^2] = 2156$

$$\Rightarrow 3 \times \frac{22}{7} \times r^2 = 2156$$

$$\Rightarrow r^2 = \frac{2156 \times 7}{66}$$

$$\Rightarrow r = \sqrt{\frac{686}{3}}$$

Now, height of equilateral triangle = $3r = \frac{\sqrt{3}}{2}a$ (where a is side of triangle)

$$\Rightarrow 3 \times \sqrt{\frac{686}{3}} = \frac{\sqrt{3}}{2}a$$

$$\Rightarrow a = 2\sqrt{686}$$

$$\begin{aligned}\therefore \text{Area of triangle} &= \frac{\sqrt{3}}{4}a^2 \\ &= \frac{\sqrt{3}}{4} \times 4 \times 686 = 686\sqrt{3} \text{ cm}^2\end{aligned}$$

B 1000 sq.cm.

C $961\sqrt{2}$ sq.cm.D $650\sqrt{3}$ sq.cm.

QUESTION ANALYTICS

+

Q. 9

▶ Solution Video

⌚ Have any Doubt ?

🔍

p and q are positive numbers such that $p^q = q^p$, and $q = 9p$. The value of p is

A $\sqrt[9]{9}$ B $\sqrt[4]{9}$ C $\sqrt[3]{9}$ D $\sqrt[5]{9}$

Correct Option

Solution :
(d)

$$p^q = q^p$$

It has been given that $q = 9p$.

Substituting, we get,

$$\begin{aligned}p^{9p} &= (9p)^p \\ (p^p)^9 &= 9^p \times p^p\end{aligned}$$

$$\Rightarrow \begin{aligned} (p^p)^8 &= 9^p \\ p^{8p} &= 9^p \end{aligned}$$

Raising the power to $\frac{1}{p}$ on both sides, we get,

$$p^8 = 9$$

$$p = \sqrt[8]{9}.$$

 QUESTION ANALYTICS



Q. 10

Solution Video

Have any Doubt?



A cyclist rides his bicycle over a route which is $\frac{1}{3}$ uphill, $\frac{1}{3}$ level, and $\frac{1}{3}$ downhill. He covers the uphill part of the route at the rate of 16 miles per hour and the level part at the rate of 24 miles per hour. The rate in miles per hour he would have to travel the downhill part of the route in order to average 24 miles per hour for the entire route is_____.

48

Correct Option

Solution :
48

Let us assume that the total distance is (48×3) miles such that the distance traveled in each leg of the journey uphill, level and downhill is 48 miles (you can assume it to be something else or x)

$$\text{Time taken to go uphill} = \frac{48}{16} = 3 \text{ hrs}$$

$$\text{Time taken on level} = \frac{48}{24} = 2 \text{ hrs}$$

$$\text{Time taken to go downhill} = \frac{48}{d}$$

$$\text{Avg Speed} = 24 = \frac{48 \times 3}{\left(3 + 2 + \frac{48}{d}\right)}$$

$$\Rightarrow \frac{48}{d} = 1$$

$$\Rightarrow d = 48 \text{ miles/hr}$$

 QUESTION ANALYTICS



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Q. 11
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 Consider the following two regular expressions R_1 and R_2 .

$$R_1 = (a+b)^*a(a+b)(a+b)^*$$

$$R_2 = a^*bab$$

Which of the following relation is correct?

A $R_1 = R_2$

B $R_1 \subseteq R_2$

C $R_1 \supseteq R_2$

Correct Option

Solution :

(c)

$$\begin{aligned} R_1 &= (a+b)^*a(a+b)(a+b)^* \\ &= (a+b)^*aa(a+b)^* + (a+b)^*ab(a+b)^* \\ R_2 &= a^*bab \end{aligned}$$

 All strings generated by R_2 are also derived from R_1 and R_1 can derive many other strings.

 $\therefore R_1 \supseteq R_2$ is correct relation.

D None of these

[QUESTION ANALYTICS](#)

Q. 12
[Have any Doubt ?](#)

 Which of the following C expressions access the $(i, j)^{\text{th}}$ entry of an $(m \times n)$ matrix stored in column major order?

 [Assume index starts from 0th location]

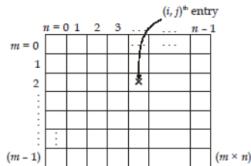
A $n \times i + j$

B $m \times j + i$

Correct Option

Solution :

(b)


 We need to cross all the columns before j and since index starting from 0 thus, we cross j columns.
 Since we have ' m ' elements in 1 column.

$$\begin{aligned} (i, j)^{\text{th}} \text{ location is } &= m \times j + j^{\text{th}} \text{ column } i \text{ elements} \\ &= m \times j + i \end{aligned}$$

C $m \times i + j$

D $n \times j + i$

[QUESTION ANALYTICS](#)

Q. 13
[▶ Solution Video](#)
[Have any Doubt ?](#)

 Identify the language L which is a CFL.

A $L = \{0^m 1^n 2^k 3^l \mid \text{if } (m = n) \text{ then } (k = l)\}$

B $L = \{0^m 1^n 2^k 3^l \mid \text{if } (n = k) \text{ then } (m = l)\}$

C Both (a) and (b)

Correct Option

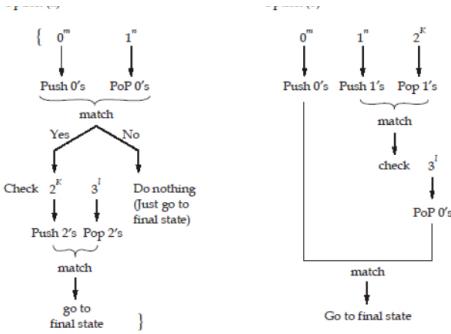
Solution :

(c)

Both the languages in option (a) and (b) are CFL.

Option (a)

Option (b)



D None of these

QUESTION ANALYTICS

Q. 14

Solution Video

Have any Doubt?



Consider the following statement. Out of the statements choose the one which best characterize computers that use memory mapped I/O.

A The computer provides special instruction for manipulating I/O port.

B I/O ports are placed at address on bus and are accessed just like other memory location.

Correct Option

Solution :

(b)

Memory mapped I/O uses the same address bus to address both memory and I/O devices the memory and registers of the I/O devices are mapped to address values.

So, when an address is accessed by the CPU, it may refer to a portion of physical RAM, but it can also refer to memory of I/O device.

C To perform an I/O operation, it is sufficient to place the data in an address and call the channel to perform the operation.

D Ports are referenced only by memory mapped instruction of the computer and are located at hardwired memory location.

QUESTION ANALYTICS



Q. 15

Solution Video

Have any Doubt?



Which of the following sorting methods sorts a given set of item that is already in sorted order or in reverse sorted order with equal speed?

A Insertion sort

B Quick sort

Correct Option

Solution :

(b)

Quick sort has two worst cases, when input is in either ascending as descending order.

It takes $O(n^2)$ time in both cases.

C Bubble sort

D Merge sort

QUESTION ANALYTICS



Q. 16

Solution Video

Have any Doubt?



Let K_n denote the complete graph on n vertices, C_n denote the cycle graph on n vertices and W_n denote the wheel graph on n vertices. Which of the following graphs are not Euler?

A K_{97}

B C_{97}

Correct Option

C W_{97}

Solution :

(c)

For a graph to be Euler, every vertex must have even degree.

In W_{97} , many vertices have odd degree. Hence it is not euler.

In C_{97} , each vertex has even degree. Thus it is euler.

Similarly in K_{97} too, each vertex has even degree and thus it is euler as well.
Therefore the correct option is (c), as the only non Euler graph is W_{97} .

- D None of these

QUESTION ANALYTICS

Q. 17

Solution Video

Have any Doubt?



Which of the below statement is false?

- A Round-Robin scheduling policy is most suitable for a time shared operating system.
- B A multi-user, multiprocessing operating system can not be implemented on hardware that does not support atleast 2 modes of CPU execution.
- C Interrupt from CPU temperature sensor will be handled at a higher priority than interrupt from hard disk by computer.
- D While switching context from process A to process B, operating system does not change the address translation table.

Correct Option

Solution :

- (d)
- (a) Round robin works on time quantum, after certain period of time every process gets the CPU unit for its completion, hence it's most suitable.
 - (b) Since OS is multuser and multiprocessing, hence security is the primary concern so that user processes and Kernel processes can be isolated. Hence two modes are required.
 - (c) When CPU temperature is too high, the BIOS initiate an interrupt. OS given top priority to this interrupt.
 - (d) Address translation table need to be changed when switching context from process A to process B.

QUESTION ANALYTICS

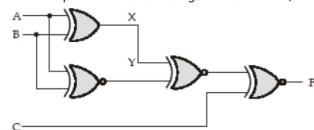
Q. 18

Solution Video

Have any Doubt?



For the output F to be 0 is the logic circuit shown, the input combination should be



- A $A = 1, B = 1, C = 0$

- B $A = 1, B = 0, C = 0$

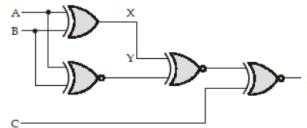
- C $A = 0, B = 1, C = 0$

- D $A = 0, B = 0, C = 1$

Correct Option

Solution :

(d)



If $A = 0, B = 0$ then

$$X = \bar{A}B + A\bar{B} = 0$$

$$Y = AB + \bar{A}\bar{B} = 1$$

F will be '0' if odd number of inputs to XNOR gate is '1'.

$C = 1$ implies $A = 0, B = 0$ and $C = 1$.

QUESTION ANALYTICS

Q. 19

Solution Video

Have any Doubt?



The reference polynomial used in a CRC scheme is $x^4 + x^3 + 1$, a data sequence 1010101010 is to be sent, which of the following is actual bit string that is transmitted?

- A 10101010101110

- B 10101010100010

Correct Option

Solution :

(b)

$$\text{CRC } x^4 + x^3 + 1 \Rightarrow 11001$$

10101010100000
11001

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 0 | 0 | 1 | | | | | |
| 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 | 1 | | | | | |
| 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 | 1 | | | | | |
| 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 | 1 | | | | | |
| 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |

0010 will be added in data.
Data will be sent 10101010100010.

C 10101010100011

D 10101010100110

QUESTION ANALYTICS



Q. 20

Have any Doubt ?



Consider the following function.
void madeeasy (int n)

```

{
    enqueue (Q, 0);
    enqueue (Q, 1);
    for (i = 0; i < n; i++)
    {
        x = dequeue (Q);
        y = dequeue (Q);
        enqueue (Q, y);
        enqueue (Q, x + y);
        print (x);
    }
}

```

What is the functionality of above function madeeasy?

A Prints numbers from 0 to $n - 1$

B Prints numbers from $n - 1$ to 0

C Prints first n Fibonacci numbers

Correct Option

Solution :

(c)

The function prints first n Fibonacci numbers. Note that 0 and 1 are initially there in the queue. This is the initial condition, for Fibonacci series. In every iteration of loop, sum of two queue items is enqueued and the front item is dequeued i.e., sum of previous 2 numbers as in Fibonacci series.

D Prints first n Fibonacci numbers in reverse order

QUESTION ANALYTICS



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Q. 21
[Solution Video](#)
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The function, $f(x) = 2x^3 - 3x^2 - 36x + 10$, has a local maximum value at ' x ' equals to

A -2

Correct Option
Solution :

(a)
 To obtain maximum value of $f(x)$, first $f'(x)$ should be equated to zero.
 $\Rightarrow f'(x) = 6x^2 - 6x - 36 = 0$
 $\Rightarrow x^2 - x - 6 = 0$
 $\Rightarrow (x - 3)(x + 2) = 0$
 $\therefore f'(x) = 0 \quad \text{at } x = 3 \text{ and } -2$
 Now, $f''(x) = 12x - 6$
 $f''(3) = 30 > 0$
 at $x = 3$, there is local minima
 and $f''(-2) = -30 < 0$
 \therefore at $x = -2$, a local maxima is observed.

B -1

C 3

D 4

QUESTION ANALYTICS

Q. 22
[Solution Video](#)
[Have any Doubt ?](#)


Consider the following statements:

- I. Symmetric relations are closed under complementation.
 - II. Asymmetric relations are closed under complementation.
- Which of the above statements are true?

A I only

Correct Option
Solution :

(a)
 Only I is true, and II is false. For II, consider the empty relation over a non empty set S, say $\{a, b, c\}$. Clearly this relation is asymmetric. However the complement of this relation will become reflexive (because it will now contain $(a, a), (b, b), (c, c)$). But we know that every asymmetric relation must be irreflexive, but here it is not irreflexive anymore, and hence the complementary relation violates asymmetry.

B II only

C Both I and II

D None of these

QUESTION ANALYTICS

Q. 23
[Solution Video](#)
[Have any Doubt ?](#)


Which of the following is true?

A For fixed length records spanned organization is preferred.

B For fixed length records unspanned organization is preferred.

Correct Option
Solution :

(b)
 For fixed length records unspanned and for variable length records spanned organization is preferred.

C For variable length records unspanned organization is preferred.

D None of these

QUESTION ANALYTICS


Q. 24

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

The number of labelled subgraphs for K_5 , which contain exactly 4 vertices is equal to (where K_n represents the complete graph on n vertices) is equal to

A 120**B** 240**C** 320

Correct Option

Solution :

(c)

The number of subgraphs of K_n containing r vertices out of n vertices is equal to ${}^n C_r$ (choosing r vertices from n vertices) $\times 2^{r(r-1)/2}$ (total edge combinations possible).

Putting n as 5, and r as 4, we get 320 as the answer.

D 360

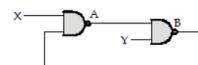
QUESTION ANALYTICS



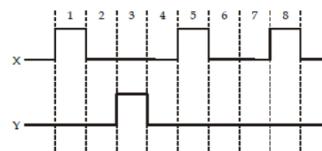
Q. 25

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

Consider the digital circuit shown below:



Where, timing diagram is given below



Value of A and B at 1, 3, 5 and 8 seconds are

A $A = 0, 1, 0, 0, B = 1, 0, 1, 1$

Correct Option

Solution :

(a)

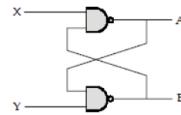
The digital circuit can be redrawn as

At the time instants 1, 3, 5 and 8 seconds

$$X = \bar{Y}$$

$$\therefore A = \bar{B}, B = \bar{A}$$

| Time | X | Y | A | B |
|------|---|---|---|---|
| 1 | 1 | 0 | 0 | 1 |
| 3 | 0 | 1 | 1 | 0 |
| 5 | 1 | 0 | 0 | 1 |
| 8 | 1 | 0 | 0 | 1 |

**B** $A = 1, 0, 1, 1, B = 0, 1, 0, 0$ **C** $A = 1, 1, 0, 0, B = 1, 1, 0, 0$ **D** $A = 0, 1, 0, 0, B = 0, 1, 0, 0$

QUESTION ANALYTICS



Q. 26

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

Consider the cache memory which is 30 times faster than main memory and it can be used 90% of the total time. The speedup gain by cache memory is _____. (Upto 2 decimal places)

7.69 [7.60 - 7.70]

Correct Option

Solution :

7.69 [7.60 - 7.70]

$$\begin{aligned} \text{Speedup (S)} &= \frac{1}{(1 - \text{Cache \% used}) + \left[\frac{\text{Cache \% used}}{\text{Speedup using cache}} \right]} \\ &= \frac{1}{(1 - F) + \left(\frac{F}{S} \right)} = \frac{1}{(1 - 0.9) + \left(\frac{0.9}{30} \right)} = \frac{1}{(0.1) + \left(\frac{0.9}{30} \right)} \\ &= \frac{30}{3.9} = 7.69 \end{aligned}$$

Q. 27

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

A channel is operating at 5000 bps and the propagation delay is 16 ms. What would be the minimum frame size (bytes) for stop and wait flow control to get 60% link utilization

30

Correct Option

Solution :

30

$$\text{Propagation delay } T_p = 16 \text{ ms}$$

 $\text{Utilization} = 60\%$

Frame size

$$0.6 = \frac{T_p}{T_i + 2T_p} = \frac{1}{1+2a}$$

$$0.6 = \frac{1}{1 + \frac{2 \times 16}{F} \times 5000 \text{ bps} \times 10^{-3}}$$

$$= 1 + \frac{160}{F} = \frac{5}{3}$$

$$= \frac{160}{F} = \frac{2}{3}$$

Frame size = 240 bits = 30 bytes

Q. 28

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

Let X be the random variable. Consider the following table with probability distribution values of X.

| | | | | | | |
|------|---|---|----|----|----|----|
| X | 0 | 1 | 2 | 3 | 4 | 5 |
| P(X) | 0 | K | 2K | 3K | 5K | 7K |

The value of $P(X < 4)$ is _____. (Upto 2 decimal places)

0.33 [0.33 - 0.34]

Correct Option

Solution :
0.33 [0.33 - 0.34]

$$\sum_{i=0}^5 P(x_i) = 1$$

$$\Rightarrow 0 + K + 2K + 3K + 5K + 7K = 1$$

$$\Rightarrow 18K = 1$$

$$\Rightarrow K = \frac{1}{18}$$

$$P(X < 4) = P(X = 0) + P(X = 1) + P(X = 2) + P(X = 3)$$

$$= 0 + K + 2K + 3K = 6K$$

$$= 6 \times \frac{1}{18} = \frac{1}{3} = 0.33$$

Q. 29

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

Consider the following page reference string with 3 frames:

2, 4, 3, 1, 5, 3, 2, 5, 3, 1, 4, 2

Number of page fault occurs if FIFO page replacement algorithm is used _____.

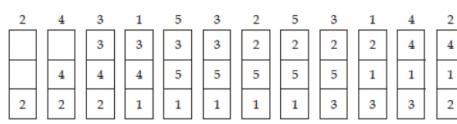
10

Correct Option

Solution :

10

2, 4, 3, 1, 5, 3, 2, 5, 3, 1, 4, 2



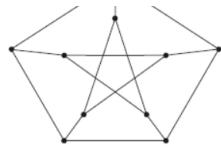
Total 10 page faults.

Q. 30

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

The chromatic number of the following graph is equal to _____.





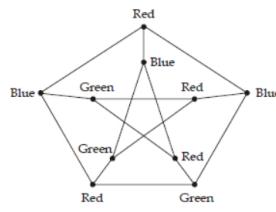
3

Correct Option

Solution :

3

The colouring is shown below:



QUESTION ANALYTICS

+

Item 21-30 of 65 [« previous](#) [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [next »](#)



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Q. 31
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The maximum number of nodes in the AVL tree of height 5 is _____. Assume root node is present at height zero.

63
[Correct Option](#)
Solution :

63

Number of (minimum) nodes = $S(l_1 - 1) + S(l_1 - 2) + 1$
 Number of (maximum) nodes = $2^{h+1} - 1 = 2^5 + 1 - 1 = 63$

Q. 32
[Solution Video](#)
[Have any Doubt ?](#)


Consider a relation with following functional dependencies:

 $R(a, b, c, d)$
 $F = \{ab \rightarrow cd, ac \rightarrow bd\}$

Number of following relation schemas might be the result of BCNF normalization preserving both functional dependency and lossless join is _____.

 I. $R_1(a, b, c)$ and $R_2(a, b, d)$

 II. $R_1(a, b), R_2(a, c)$ and $R_3(b, d)$

 III. $R(a, b, c, d)$
2
[Correct Option](#)
Solution :

2

$$\begin{aligned} R(a, b, c, d) \\ F = \{ab \rightarrow cd, ac \rightarrow bd\} \\ (ab)^+ = \{abcd\} \\ (ac)^+ = \{acbd\} \end{aligned}$$

$\{ab, ac\}$ both are keys: hence statement III itself satisfies the conditions to be in the BCNF. Hence statement III is correct.

I is correct because $R_1(a, b, c)$ preserving $\{ab \rightarrow c, ac \rightarrow b\}$ and $R_2(a, b, d)$ preserving $\{ab \rightarrow d, ac \rightarrow d\}$ and it is also lossless join. So statement I is correct.

Q. 33
[Have any Doubt ?](#)


Consider the following grammar:

 $S \rightarrow ACB \mid cB \mid Ba$
 $A \rightarrow da \mid BC$
 $B \rightarrow g \mid \epsilon$
 $C \rightarrow h \mid \epsilon$

Number of elements in FIRST(A) _____.

4
[Correct Option](#)
Solution :

4

$$\begin{aligned} S &\rightarrow ACB \mid cB \mid Ba \\ A &\rightarrow da \mid BC \\ B &\rightarrow g \mid \epsilon \\ C &\rightarrow h \mid \epsilon \\ \text{FIRST}(A) &= \{d\} \cup \text{FIRST}(B) \\ &= \{d\} \cup \{g, \epsilon\} \cup \text{FIRST}(C) \\ &= \{d\} \cup \{g, \epsilon\} \cup \{h, \epsilon\} \\ &= \{d, g, h, \epsilon\} \end{aligned}$$

Total 4 elements.

Q. 34
[Solution Video](#)
[Have any Doubt ?](#)


Consider the following statements:

I. Fractional Knapsack is efficiently solved using dynamic programming.

 II. The number of possible parenthesization of a sequence of n matrices is $O(n)$.

Number of correct statement(s) is/are _____.

0

Correct Option

Solution :

- I. Fractional Knapsack is efficiently solved using greedy algorithm.
 II. The number of possible parenthesization of a sequence of n matrices is $\Omega(2^n)$.

QUESTION ANALYTICS

**Q. 35**

Have any Doubt ?



Consider a hash table of size 10 that uses open addressing with linear probing. Let $h(k) = k \bmod 10$ be the hash function used. A sequence of records with keys: 83, 84, 95, 74, 23, 86, 41, 62, 72 is inserted into an initially empty hash table, the bins of which are indexed from 0 to 9. The number of unsuccessful probes needed to find the index of bin which contain last element _____.

7

Correct Option

Solution :

7

Hash Table

| | |
|----|------------------------|
| | 0 |
| 41 | 1 |
| 62 | 2 ⇐ Unsuccessful probe |
| 83 | 3 ⇐ Unsuccessful probe |
| 84 | 4 ⇐ Unsuccessful probe |
| 95 | 5 ⇐ Unsuccessful probe |
| 74 | 6 ⇐ Unsuccessful probe |
| 23 | 7 ⇐ Unsuccessful probe |
| 86 | 8 ⇐ Unsuccessful probe |
| 72 | 9 ⇐ Successful probe |

QUESTION ANALYTICS

**Q. 36**

Solution Video

Have any Doubt ?



Consider the following algorithm:

```
int t, j, i;
for (i = 1, i < n, i++)
{
    t = A[i];
    for (j = i - 1; j ≥ 0 && (A[j] > t); i--)
    {
        A[j + 1] = A[j];
        A[j] = t;
    }
}
```

If the array $A[n]$ is sorted in the ascending order then what is the time complexity of the algorithm?**A** $O(n \log n)$

Correct Option

B $O(n)$ **Solution :**

(b)

First for loop will run n time, because of sorted array, second for loop runs one time.Time complexity = $O(n)$ **C** $O(\log n)$ **D** $O(n^2)$

QUESTION ANALYTICS

**Q. 37**

Solution Video

Have any Doubt ?



Consider the following statements:

- I. In distance vector protocol the shortest path algorithm is run only at one node.
 II. Distance vector requires lesser number of network messages than link state routing.
 III. E-mail is not a client server application.
 Which of the following statement(s) is/are correct?

A I and II only**B** II and III only**C** I and III only**D** II only

Correct Option

Solution :

- (d)
- In DVR the shortest path calculate at each nodes.
- DVR requires less number of network message than LSR (flooding is followed in LSR).
- E-mail is a client server application.

QUESTION ANALYTICS**Q. 38****Solution Video****Have any Doubt ?**

Consider a function f given by, $f(x) = kx$. It is known that $f(x)$ happens to be its own inverse. Which of the following is not a possible value for k ?

A 1**B** -1**C** 2**Correct Option****Solution :**

(c)

$$f(x) = kx$$

... (1)

$$\begin{aligned} \text{Let } & y = f(x) \\ \text{Therefore } & y = kx \end{aligned}$$

$$\text{This means, } x = \frac{y}{k}$$

Now substitute y as x and x as $f^{-1}(x)$.

$$\text{Thus } f^{-1}(x) = \frac{x}{k}$$

... (2)

According to the question, (1) and (2) are equal. Therefore,

$$Kx = \frac{x}{k}$$

$$\Rightarrow (k^2 - 1)x = 0$$

$$\Rightarrow (k - 1)(k + 1)x = 0$$

Therefore $k = 1$ or -1 .

D None of these**QUESTION ANALYTICS****Q. 39****Solution Video****Have any Doubt ?**

Consider the following 'C' code:

| | |
|--------------------|---|
| $x = 0;$ | } |
| $y = 1;$ | |
| $z = \text{true};$ | |

P_1
while ($x < y$)
 $\{x = x + 1\}$

P_2
while (z)
 $\{y = y + 1; z = (x != y);\}$

Assume P_1 and P_2 are two concurrent processes and sharing the global variables x , y and z .

Assignments and tests are atomic. Consider the following statements:

- S_1 : There exists atleast one case in which P_1 and P_2 terminates.
- S_2 : There exists atleast one case in which P_1 terminates but P_2 does not.
- S_3 : There exists atleast one case in which P_2 terminates but P_1 does not.
- S_4 : There exists atleast one case in which neither P_1 nor P_2 terminates.

What is the number of correct statement about code of P_1 and P_2 ?

A 2**B** 3**Correct Option****Solution :**

(b)

Initially : $x = 0$, $y = 1$, $b = \text{true}$;

P_1 : 1. while ($x < y$)

- 2. $\{x = x + 1\}$

P_2 : 1. while (z)

- 2. $\{y = y + 1;$
- 3. $z = (x != y);$

1. Both threads terminate : is possible.

P_2 : 1, 2

P_1 : 1, 2, 1, 2, 1 (terminated)

P_2 : 3, 1 (terminated)

2. P_1 terminates but P_2 does not : is possible

P_1 : 1, 2, 1 (terminated)

P_2 : 1, 2, 3, 1, 2, 3 (infinite loop)

3. P_2 terminates but P_1 does not : is not possible

4. Neither P_1 nor P_2 terminates : is possible

P_2 : 1, 2, 3

P_1 : 1, 2

P_2 : 1, 2, 3 } Infinite iterations

P_1 : 1, 2 } $(P_2$ followed by $P_1)$

C 1

Q. 40

Solution Video

Have any Doubt?



Consider the following relations:

Supplier (sno, sname, city)

Item (no, name, brand, sno)

Which of the following query gives suppliers names who have submitted at least one 'Harvest' brand item? (sno in item is the foreign key referencing sno in supplier).

- I. Select sname FROM Supplier S, Item t where t.brand = 'Harvest'
- II. Select sname FROM Supplier S where sno IN (Select sno FROM Item where brand = 'Harvest')

A I only

B II only

Correct Option

Solution :

(b)

Only query II gives the required result.

C Both I and II

D None of these



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ALL(65) CORRECT(0) INCORRECT(0) SKIPPED(65)

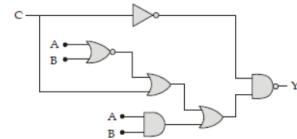
Q. 41

Solution Video

Have any Doubt?



In the circuit shown in the figure, if $C = 0$, the expression for Y is

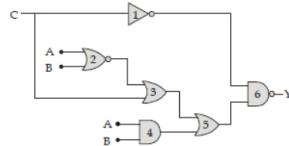


A $Y = \bar{A}\bar{B} + \bar{A}B$

Correct Option

Solution :

(a)



Output of gate 1: \bar{C}

Output of gate 2: $\rightarrow (\bar{A} + \bar{B})$

Output of gate 3: $\rightarrow (\bar{A} + \bar{B} + C)$

Output of gate 4: $\rightarrow AB$

Output of gate 5: $\rightarrow (\bar{A} + \bar{B} + C) + AB$

$$\begin{aligned} \text{Output of gate 6 is output } Y \text{ i.e. } Y &= \overline{\bar{C} \cdot (\bar{A} + \bar{B} + C) + AB} \\ &= C + \overline{(\bar{A} + \bar{B} + C + AB)} \end{aligned}$$

$$\begin{aligned} \text{Using Demorgan's theorem} &= C + \overline{(\bar{A} + \bar{B})} \cdot \bar{C} \cdot (\bar{A}\bar{B}) \\ &= C + (A + B) \cdot \bar{C} \cdot (\bar{A} + \bar{B}) \end{aligned}$$

Given in question $C = 0$,

$$\begin{aligned} \text{So, } Y &= 0 + (A + B) \cdot \bar{0} \cdot (\bar{A} + \bar{B}) \\ &= \bar{A}B + A\bar{B} \end{aligned}$$

B $Y = A + B$

C $Y = \bar{A} + \bar{B}$

D $Y = AB$

QUESTION ANALYTICS



Q. 42

Solution Video

Have any Doubt?



Consider a network with IP address 172.60.50.2 and subnet mask 255.255.224.0, which of the following is the range of assignable IP address on the subnet in which the host belongs?

A 172.60.32.1 – 172.60.63.254

Correct Option

Solution :

(a)

IP address = 172.60.50.2

Subnet mask = 255.255.224.0

Subnet = 172.60.32.0

Address range which can be assigned to host 172.60.32.1 – 172.60.63.254
 So option (a) is correct.

B 172.60.32.0 – 172.60.63.255

C 172.60.32.1 – 172.60.64.255

D 172.60.32.0 – 172.60.127.254

QUESTION ANALYTICS



Let $L = \{a^m b^n d^k \mid \text{if}(n+k = \text{even}) \text{ then } m = \ell\}$. Which of the following is true about L ?

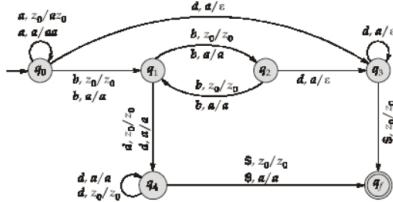
- A L is CFL but not DCFL
- B L is regular but not CFL
- C L is DCFL but not regular

Correct Option

Solution :

(c)

$$\begin{aligned} L &= \{a^m b^n d^k \mid \text{if } n+k = \text{even} \text{ then } m = \ell\} \\ &= \{a^m b^{2n} d^m\} \cup \{a^m b^{2n+1} d^k\} \\ &= \text{DCFL} \cup \text{regular} = \text{DCFL} \end{aligned}$$

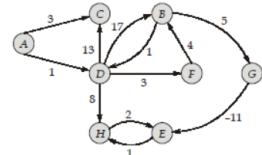


- D None of these

[QUESTION ANALYTICS](#)

+

Consider the graph given below:



Suppose you are running Dijkstra's algorithm starting from some source vertex D . The table given below shows the shortest path tree immediately after vertex E has been relaxed.

| Vertex | Distance to | Parent |
|--------|-------------|--------|
| A | ∞ | NULL |
| B | 7 | F |
| C | 13 | D |
| D | 0 | NULL |
| E | 10 | H |
| F | 3 | D |
| G | 12 | B |
| H | 8 | D |

Which of the following vertex is NOT relaxed before E ?

- A F
- B
- C H
- D None of these

Correct Option

Solution :

(d)
Starting vertex is D

| | A | B | C | D | E | F | G | H |
|---|---------------|----------|----------|-----------|---------------|----------|---------------|---------------|
| D | ∞ | ∞ | ∞ | 0 Null | ∞ | ∞ | ∞ | ∞ |
| F | ∞ | 17 D | 13 D | — | ∞ D | 3 D | ∞ D | ∞ D |
| B | ∞ E | 7 D | 13 D | — | ∞ | — | ∞ D | ∞ D |
| H | ∞ | — | 13 D | — | ∞ | — | 12 E | 8 D |
| E | ∞ | — | 13 D | — | 10 H | — | 12 E | ∞ |
| | | | | | | | — | 12 E |

All the vertices (F, B, H) are relaxed before vertex E.

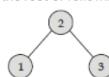
[QUESTION ANALYTICS](#)

+

Consider the following program:

```
void find (struct Node *node)
{
    struct Node *ptr, *q;
    if (node == NULL) return;
    find (node -> left);
    find (node -> right);
    ptr = node -> left;
    q = (struct Node *) malloc (size of (Node));
    q -> right = NULL;
    q -> left = NULL;
    q -> data = node -> data;
    node -> left = q;
    node -> left -> left = ptr;
}
```

If the root of following tree is passed to the above function, find the sum of all keys in the resultant tree produced by find ()�



A 6

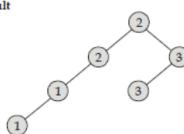
B 10

C 12

Correct Option

Solution :
(c)

Result



Given function duplicates each node

$$\text{Sum} = (2 + 1 + 3) * 2 = 12$$

D 14

QUESTION ANALYTICS



Q. 46

Solution Video

Have any Doubt ?



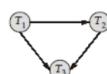
Consider the following schedules:

$S_1: R_1(a), R_1(b), W_1(a), W_2(b), R_3(b), R_2(c), W_1(a), W_2(a), W_3(b), C_1, C_2, C_3$
Which of the following is true about the schedule S_1 ?

A Conflict serializable, recoverable

Correct Option

Solution :
(a)



∴ Schedule is conflict serializable.

| T_1 | T_2 | T_3 |
|----------------------------|--------|--------|
| $R(a)$ $R(b)$ $W(a)$ | | |
| | $W(b)$ | |
| | $R(c)$ | $R(b)$ |
| $W(a)$ | $W(a)$ | $W(b)$ |
| C_1 | C_2 | C_3 |

Schedule is recoverable.

B Conflict serializable, non-recoverable

C Non-conflict serializable, recoverable

D Non-conflict serializable, non-recoverable

QUESTION ANALYTICS



Q. 47

Solution Video

Have any Doubt ?



Consider the following C program:

```
#include <stdio.h>
#include <string.h>
void point_length (char * s, char * t)
{
    unsigned int c = _____;
    int len = ((strlen(s) - strlen(t)) ≥ c)? strlen(s): strlen(t);
    printf("%d\n", len);
}
void main()
{
    char * x = "abc";
    char * y = "defgh";
    point_length (x, y);
}
```

Recall that strlen is defined in <string.h> as returning a value of type size_t, which is an unsigned int. The value of c for which the output of 5? Assume int takes 2 Bytes of memory?

A 0

B 65535

Correct Option

Solution :

(b)

$[\text{strlen}(s) - \text{strlen}(t)] = -2$
Since, it will stored in 2's complement representation.

i.e. $\begin{array}{c} 111111111111110 \\ \hline | \\ \hline \end{array}$
16 bits

Hence for output 5 only $\begin{array}{c} 111111111111111 \\ \hline | \\ \hline \end{array} = 65535$, this condition becomes false and 5 gets

$\begin{array}{c} 111111111111111 \\ \hline | \\ \hline \end{array}$
16 bits
printed.

C 15

D Can never give 5 as output

QUESTION ANALYTICS

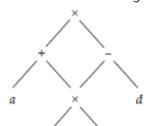


Q. 48

Have any Doubt ?



Consider the following DAG:



Which of the following expression has above DAG representation?

A $a + (b \times c) - d$

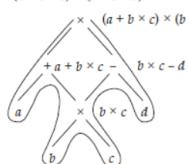
B $(a + b \times c) \times (b \times c - d)$

Correct Option

Solution :

(b)

$(a + b \times c) \times (b \times c - d)$



C $a + (b \times c) - d \times b \times c$

D None of these

QUESTION ANALYTICS



Q. 49

Solution Video

Have any Doubt ?



Consider the following probability density function with continuous random variable.

$$f(x) = 100e^{-100x}, \text{ if } x \geq 0$$

$$= 0, \text{ if } x < 0$$

Find the probability that x is greater than 0.01.

A 0

B 1

C

$$\frac{1}{e}$$

Correct Option

Solution :

(c)

$$\begin{aligned} P(x > 0.01) &= \int_{0.01}^{\infty} 100 \cdot e^{-100x} dx \\ &= \left[\frac{100 \cdot e^{-100x}}{-100} \right]_{0.01}^{\infty} = 0 + e^{-100 \times 0.01} = e^{-1} = \frac{1}{e} \end{aligned}$$

D

$$\frac{1+1}{e}$$

QUESTION ANALYTICS



Q. 50

Have any Doubt ?



What does the following fragment of C program print?

```
char x[] = "JSHAKZAAOHE";
char *y = x;
printf("%s", x + y[10] - y[7]);
```

A Prints the entire string

B Prints only "AKZAAOHE"

C Prints only "KZAAOHE"

Correct Option

Solution :

(c)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|----|
| X | J | S | H | A | K | Z | A | A | O | H | E |
| Y | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

x = 2000
y = 2000
y[10] = E (69 in ASCII)
y[7] = A (65 in ASCII)
x + y[10] - y[7]
= 2000 + 69 - 65 = 2004

Therefore it prints from the array starting at address 2004 to the end i.e., "K Z A A O H E".

D Prints only "AOHE"

QUESTION ANALYTICS



Item 41-50 of 65 « previous 1 2 3 4 5 6 7 next »



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Q. 51
[Solution Video](#)
[Have any Doubt ?](#)


Let L1 be the language accepted by DFA D1 and L2 be the language accepted by DFA D2. Similarly L3 and L4 languages are accepted by NFA N1 and N2 respectively.

1. D2 is obtained by swapping the accepting and non-accepting states of D1
2. N2 is obtained by swapping the accepting and non-accepting states of N1

Which of the following statement is incorrect?

A L2 is complement of L1.

B Class of languages recognized by NFA's is not closed under complement.

[Correct Option](#)

Solution :

(b)

Class of languages recognized by NFA's

\equiv

Class of languages recognized by DFA's

\equiv

Class of regular languages

\Downarrow

Closed under complement.

So option (b) is not correct statement.

[Note: Given data is applicable to option (a) only]

C Class of languages recognized by DFA's is closed under complement.

D None of these

QUESTION ANALYTICS


Q. 52
[Solution Video](#)
[Have any Doubt ?](#)


Consider a system in which DMA technique is used to transfer 32 MB of data from an I/O device into memory. The bandwidth of I/O device is 256 KB/s. Once the data is filled into interface buffer, the DMA controller takes over the bus and transfer it to main memory in 28 sec. What percentage of the time is the CPU in blocked mode (approximately)?

A 18

[Correct Option](#)

Solution :
 (a)

$$\text{Time taken by I/O device to place data in buffer} = \frac{32 \text{ MB}}{256 \text{ KB}} = 125 \text{ sec}$$

$$\text{Percentage of time CPU blocked} = \frac{28}{125 + 28} \times 100 = 18.3\%$$

B 82

C 35

D 45

QUESTION ANALYTICS


Q. 53
[Have any Doubt ?](#)


Consider the following socket API functionalities:

- S_1 : It is used on the server side and causes a bound TCP socket to enter listening state.
- S_2 : It is used on the server side, and associates a socket with a socket address structure.
- S_3 : It is used on the client side, and assigns a free local port number to the socket.
- S_4 : It causes the system to release resources allocated to a socket.

Which of the following is correct?

- | | | | |
|---------------|-----------|------------|----------|
| S_1 | S_2 | S_3 | S_4 |
| (a) Accept () | Bind () | Socket () | Poll () |
| (b) Listen () | Socket () | Connect () | Close () |
| (c) Listen () | Bind () | Connect () | Close () |
| (d) Accept () | Socket () | Bind () | Poll () |

A a

B b

C c

Correct Option

Solution :

- (c)
 - Listen () : Used on server side, cause a bound TCP socket to enter listening state.
 - Bind () : Associates a socket with socket address structure.
 - Connect () : It assigns a free local port number to a socket. In case of TCP socket, it causes an attempt to establish a new TCP connection.
 - Close () : It terminates the connection.
 - Socket () : Creates a new socket of certain socket type.
 - Poll () : Used to check on the state of a socket.
 - Accept () : Accepts a received incoming attempt to create a new TCP connection from the remote client.

D d

QUESTION ANALYTICS



Q. 54

Solution Video

Have any Doubt ?



How many cards must be selected from a standard deck of 52 cards to guarantee that at least three hearts are present among them _____.

C 42

Correct Option

Solution :

42

In a deck of 52 cards, we have 13 cards each for hearts, spades, diamonds and clubs.

Now in the worst case, the first 39 selections may go like this: we may end up picking 13 spades, 13 diamonds and 13 clubs in any random order. Now only hearts remain, and after picking 3 more cards, we can guarantee that at least 3 hearts are present. Hence we need to select 42 cards to guarantee the same.

QUESTION ANALYTICS



Q. 55

Solution Video

Have any Doubt ?



Let $L = \{\text{madeeasy2016}\}$ over $\Sigma = \{m, a, d, e, s, y, 2, 0, 1, 6\}$, $L1 = \text{prefix}(L)$ and $L2 = \frac{L1}{\Sigma^*}$. The number of strings in $L2$ (assume $L1$ and $L2$ do not include empty string) are _____.

C 12

Correct Option

Solution :

12

$L = \{\text{madeeasy2016}\} \Rightarrow L1 = \{m, ma, mad, made, madee, madeea, madeeas, madeeasy, madeeasy2, madeeasy20, madeeasy201, madeeasy2016\}$

$$L2 = \frac{L1}{\Sigma^*} = \{m, ma, mad, made, madee, madeea, madeeas, madeeasy, madeeasy2, madeeasy20, madeeasy201, madeeasy2016\} = L$$

\therefore Total 12 strings

$[\because \text{Prefix}(L)/\Sigma^* = \text{Prefix}(L)]$

QUESTION ANALYTICS



Q. 56

Solution Video

Have any Doubt ?



Consider a message that is 8×10^6 bits long, that is to be sent from a source to a destination, which are separated by two routers in between. Suppose each of the link in the path has bandwidth 2 Mbps. Packet is fragmented into 800 packets, with each packet being 10000 bits long. The total time to move message from source host to destination host is _____ (in μ sec). (Upto 2 decimal places). Assume propagation delay is negligible.

C 4.01 [4.01 - 4.10]

Correct Option

Solution :

4.01 [4.01 - 4.10]

$$\text{Transmission time} = \frac{10^4 \text{ b}}{2 \times 10^6 \text{ b/s}} = 5 \text{ msec}$$

Time at which 1st packet is received at the destination host = 5 msec \times 3 hops = 15 msec.

After this, for every 5 msec, one packet will be received,

Then time at with 800th packet received = 15 + (799 \times 5 msec)

$$= 15 + (3995 \text{ msec})$$

$$= 4010 \text{ msec}$$

$$= 4.010 \mu\text{sec}$$

QUESTION ANALYTICS



Q. 57

Solution Video

Have any Doubt ?



Disk requests come to a disk driver for cylinders 98, 183, 37, 122, 14, 124, 65, 67 in that order at a time when the disk drive is reading from the cylinder 53. The total seek time when disk uses shortest seek time first scheduling algorithm _____.

236

Correct Option

Solution :

236

Requests 98, 183, 37, 122, 14, 124, 65, 67

$$\begin{aligned}\text{Total seek time} &= (65 - 53) + (67 - 65) + (37 - 37) + (37 - 14) + (98 - 14) + (122 - 98) \\ &\quad + (124 - 122) + (183 - 124) \\ &= 12 + 2 + 30 + 23 + 84 + 24 + 2 + 59 = 236\end{aligned}$$

QUESTION ANALYTICS



Q. 58

Solution Video

Have any Doubt ?



Consider the following table:

| Char | a | b | c | d |
|-----------|----|---|---|---|
| Frequency | 18 | 3 | 6 | 8 |

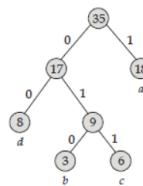
The number of bits that are needed to encode a string containing 10 a, 5 b, 2 c and 8 d using the Huffman coding _____.

61

Correct Option

Solution :

61



$a = 1, b = 010, c = 011, d = 00$

Number of bits needed = $8 \times 2 + 3 \times 3 + 6 \times 3 + 18 \times 1 = 61$

QUESTION ANALYTICS



Q. 59

Solution Video

Have any Doubt ?



Suppose that a certain computer with virtual memory has 4 KB pages and 32 bit virtual address space and 30 bit physical address space, system has inverted page table where each page table entry includes page number plus 12 overhead bits, size of the inverted page table _____ (in MB).

1

Correct Option

Solution :

1

Virtual address space = 2^{32} B

Physical address space = 2^{30} B

Page size = 2^{12} B

$$\text{Number of frames} = \frac{2^{30}}{2^{12}} = 2^{18}$$



$$\begin{aligned}\text{Inverting page table size} &= 2^{18} \times (20 + 12) \text{ bits} \\ &= 2^{18} \times 4 = 2^{20} \text{ B} \\ &= 1 \text{ MB}\end{aligned}$$

QUESTION ANALYTICS



Q. 60

Have any Doubt ?



The value of the determinant of A is _____

$$A = \begin{pmatrix} 3 & -4 & 7 & 9 & 5 \\ 4 & 0 & 0 & 0 & 0 \\ 17 & 21 & -5 & 11 & 6 \\ 0 & 0 & 2 & 0 & 0 \\ 0 & 3 & 0 & 0 & 0 \end{pmatrix}$$

-24

Correct Option

Solution :

-24

$$\begin{pmatrix} 3 & -4 & 7 & 9 & 5 \\ 4 & 0 & 0 & 0 & 0 \end{pmatrix}$$

$$A = \begin{vmatrix} 17 & 21 & -5 & 11 & 6 \\ 0 & 0 & 2 & 0 & 0 \\ 0 & 3 & 0 & 0 & 0 \end{vmatrix}$$

$R_1 \leftrightarrow R_2, R_3 \leftrightarrow R_2, R_3 \leftrightarrow R_4$

$$\Rightarrow \det(A) = (-1)^3 \begin{vmatrix} 4 & 0 & 0 & 0 & 0 \\ 0 & 3 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 \\ 17 & 21 & -5 & 11 & 6 \\ 3 & -4 & 7 & 9 & 5 \end{vmatrix}$$

$$= -1 \left(4 \times \begin{vmatrix} 3 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 \\ 21 & -5 & 11 & 6 \\ -4 & 7 & 9 & 5 \end{vmatrix} - 0 + 0 - 0 + 0 \right)$$

$$= -1 \left(4 \times 3 \times \begin{vmatrix} 2 & 0 & 0 \\ -5 & 11 & 6 \\ 7 & 9 & 5 \end{vmatrix} \right) = -1 \left(4 \times 3 \times 2 \begin{vmatrix} 11 & 6 \\ 9 & 5 \end{vmatrix} \right)$$

$$= -1(4 \times 3 \times 2 (55 - 54)) = -24$$

QUESTION ANALYTICS

+

Item 51-60 of 65 « previous 1 2 3 4 5 6 7 next »



Kunal Jha

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Q. 61
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Given preorder and postorder traversal of binary search tree.

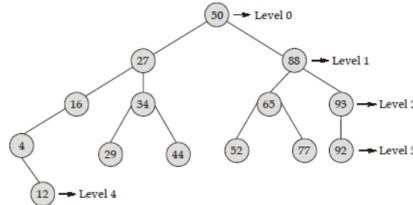
Preorder: 50, 27, 16, 4, 12, 34, 29, 44, 88, 65, 52, 77, 93, 92

Postorder: 12, 4, 16, 29, 44, 34, 27, 52, 77, 65, 92, 93, 88, 50

The number of nodes present at level 3 are _____. Assume root is present at level 0.

6
[Correct Option](#)
Solution :

6

Preorder: 50, 27, 16, 4, 12, 34, 29, 44, 88, 65, 52, 77, 93, 92


Number of nodes at level 3 = 6

QUESTION ANALYTICS

Q. 62
[Solution Video](#)
[Have any Doubt ?](#)


Consider the following statements:

- In a SQL query "IN" can be replaced by "ALL".
- Relational calculus is a procedural query language.
- Anchor record is first record of the block.

Number of correct statement(s) is/are _____.

1
[Correct Option](#)
Solution :

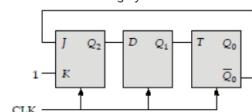
1

 In a SQL query "IN" can be replaced by "ANY".
 Relational calculus is a non procedural language.
 Anchor record is first record of the block.

QUESTION ANALYTICS

Q. 63
[Solution Video](#)
[Have any Doubt ?](#)


Consider the following synchronous counter made up of JK, D and T flip-flops.



The modulus value of the counter is _____.

5
[Correct Option](#)
Solution :

5

| CLK | Q_2 | Q_1 | Q_0 | FF2 | | FF1 | FF0 |
|-----|-------|-------|-------|-----------------|---------|-----------|-----------|
| | | | | $J = \bar{Q}_0$ | $K = 1$ | $D = Q_2$ | $T = Q_1$ |
| 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2 | 1 | 0 | 0 | 1 | 1 | 1 | 0 |
| 3 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| 4 | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| 5 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| | 0 | 0 | 0 | | | | |

The number of used states = 5

∴ Modulus value = 5

QUESTION ANALYTICS


Consider the following statements:

- I. In LL grammar, the usage of production rule can be predicted exactly by looking at a limited part of input.
 - II. A regular grammar is always linear but not all linear grammar are regular.
- The number of correct statement(s) is/are _____.

2

Correct Option

Solution :

2

- I. In LL grammar, the usage of production rule can be predicted exactly by looking limited part of input.
- II. A regular grammar always linear but all linear grammar may not be regular.

QUESTION ANALYTICS

+

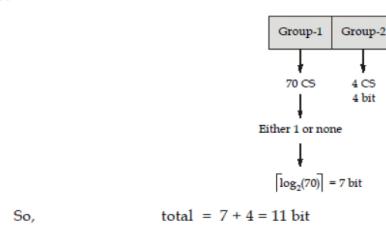
The control field of 1-address control word has to support 22 groups of control signals. In the group 1 it requires to generate either 1 or none of the 70 control signals. In the group 2 at most 4 from the remaining. The minimum number of bits needed for control field is _____.

11

Correct Option

Solution :

11



QUESTION ANALYTICS

+