

1. Find the sum of first 15 terms of the series  $(2^2 - 1^2) + (4^2 - 3^2) + (6^2 - 5^2) + \dots$

TTA : 367 Seconds

- A) 455 B) 460 C) 465 D) 470

2. Select the pair that does not express a relationship similar to that expressed in the pair: Skin: dermatologist

TTA : 50 Seconds

- A) Teeth: dentist B) Bones: orthopedist  
C) Children: pediatrician D) Heart: cardiologist

3. How many times from 1:00 pm would the minute and hour hands of a clock make an angle of  $40^\circ$  with each other in the next 6 hours?

TTA : 115 Seconds

- A) 6 B) 7 C) 11 D) 12

4. In the following question, an idiomatic expression or a proverb is highlighted. Select the alternative which best describes its use in the sentence. I am very much interested to know the outcome of this policy, kindly keep me in the loop.

TTA : 43 Seconds

- A) out of it B) Informed about the policy  
C) Informed about the drawbacks D) Informed regularly

5. ದೋಣಿಯ ವೇಗ ಇನ್ನೂ ನೀರಿನಲ್ಲಿ 6 ಕಿ.ಮೀ. / ಗಂ. ಮತ್ತು ಸ್ಪ್ರೀಮ್ ವೇಗವು 3 ಕಿ.ಮೀ. / ಗಂ. ಒಂದು ಸ್ಥಳಕ್ಕೆ ಹೋಗಿ ಮತ್ತೆ ಹಿಂತಿರುಗಲು ದೋಣಿ 8 ಗಂಟೆಗಳಿಗೆ ಹೋದರೆ, ಈ ಸ್ಥಳದ ದೂರ (ಕಿ.ಮೀ) ಯಾವುದು?

TTA : 113 Seconds

- A) 12 B) 18 C) 24 D) 15

6. A class has 5 students of different but unknown weights each weighing less than 100 kg. A student weights the students in pairs. The weights obtained are 115, 117, 118, 119, 120, 121, 122, 123, 126, 127 kg. What is the weight of second heaviest student?

TTA : 241 Seconds

- A) 63 kg B) 61 kg C) 65 kg D) 62 kg

7. A, B, C, D, E, और F एक गोलाकार में केंद्र की ओर सम्मुख होकर बैठे हैं। इनके जन्मदिन 2, 3, 4, 5, 6 और 8 तारीख को हैं। 3 तारीख को पैदा हुआ व्यक्ति, 5 तारीख को पैदा हुए व्यक्ति के विपरीत बैठा है। 3 तारीख को पैदा हुआ व्यक्ति E के संलग्न नहीं बैठा है। E, F के दाएं तीसरे स्थान पर बैठा है और उसका जन्म 2 तारीख को हुआ था। C, E के दाएं बैठा है। F का जन्म वर्ग संख्या की तारीख को हुआ था। A, C के विपरीत बैठा है, जिसका जन्म घन संख्या की तारीख को हुआ था। D, E के निकटतम बाएं बैठा है। E और B के ठीक बीच में कौन बैठा है?

TTA : 248 Seconds

- A) F B) A C) C D) D

8. Opponents of laws that require automobile drivers and passengers to wear seat belts argue that in a free society people have the right to take risks as long as people do not harm others as a result of taking the risks. As a result, they conclude that it should be each person's decision whether or not to wear a seat belt. Which of the following, if true, most seriously weakens the conclusion drawn above?

TTA : 101 Seconds

A) Many new cars are built with seat belts that automatically fasten when someone sits in the front seat.

B) Automobile insurance rates for all automobile owners are higher because of the need to pay for the increased injuries or deaths of people not wearing seat belts.

C) Passengers in airplanes are required to wear seat belts during take-offs and landings.

D) The rate of automobile fatalities in states that do not have mandatory seat belt laws is greater than the rate of fatalities in states that do have such laws.

9. There are 15 points in a plane, out of which 5 points are co-linear. Find the no. of triangles formed by the points as vertices.

TTA : 132 Seconds

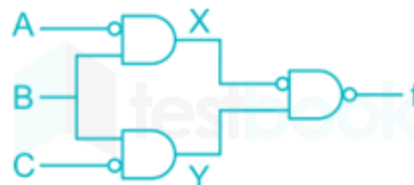
- A) 445 B) 545 C) 455 D) 555

10. Suppose three meetings of a group of professors were arranged in Mumbai, Delhi and Chennai. Each professor of the group attended exactly two meetings. 21 professors attended Mumbai meeting, 27 attended Delhi meeting and 30 attended Chennai meeting. How many of them attended both the Chennai and Delhi meetings?

TTA : 168 Seconds

- A) 18 B) 24  
C) 26 D) Cannot be found from the above information

11. Consider the following circuit:



Which of the following is TRUE?

TTA : 126 Seconds

- A) f is independent of A B) f is independent of B  
C) f is independent of C D) None of A, B, C are redundant

12. If a square matrix of order 50 has exactly 10 distinct eigenvalue, the degree of the minimal polynomial is

TTA : 67 Seconds

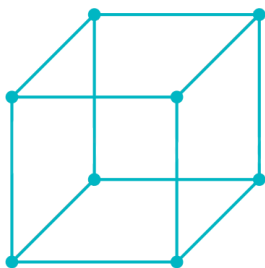
- A) Exactly 50 B) At most 10  
C) At least 10 D) Exactly 10:

13. Let the linked list be  $34 \rightarrow 56 \rightarrow 12 \rightarrow 45 \rightarrow 56 \rightarrow 16$  and the addresses corresponding to the data be 100, 200, 300, 400, 500 and 600 respectively. If target is 45(data) and head is 100 (address), then what will be return by the function search\_List. Assume next is pointer to a structure and data is structure data type? Struct node \*search\_List(struct node \*head, int target) { If(head) { while(head) { if(head → data == target) return head → next; head = head → next; } } return head; }

TTA : 145 Seconds

- A) 100 B) 56 C) 500 D) None of these

14. What is the chromatic number of the given graph Q?



TTA : 59 Seconds

15. The process executes the code where  $i$  is an integer: for( $i = 0$ ;  $i \leq 15$ ;  $i++$ ) { if( $i == 5$ ) continue; fork(); if( $i == 10$ ) break; } The total number of new processes created is \_\_\_\_.

TTA : 100 Seconds

A) 2047      B) 511      C) 11      D) 1023

16. Consider a simple planar graph with 378 edges which turns out to be maximum, then the number of vertices present in a graph is \_\_\_\_ in octal.

TTA : 151 Seconds

17. Consider the following grammar:  $P \rightarrow QR$   $R \rightarrow +QR \mid \epsilon$   $Q \rightarrow TU$   $U \rightarrow *TU \mid \epsilon$   $T \rightarrow (P) \mid a$  What is follow( $T$ )?

TTA : 112 Seconds

A)  $\{+, \$\}$       B)  $\{), \$\}$       C)  $\{*, +, \$\}$       D)  $\{*, +, ), \$\}$

18. Consider the grammar defined by the following production  $P \rightarrow Q \mid P * Q$   $Q \rightarrow R + Q \mid R$   $R \rightarrow T - R \mid T$   $T \rightarrow \text{id}$  where  $*$  is multiplication,  $+$  is addition and  $-$  is subtraction operation. The output of the given expression  $9 * 5 * 11 - 10 - 8 + 3$  is \_\_\_\_.

TTA : 146 Seconds

19. Which one of the following choices given below would be printed when the following program is executed? #include<stdio.h>

```
void display(int *tb[ ]);
int main()
{
    int array1[ ] = {2,5,8,12,6,9};
    int array2[ ] = {-12, 4, 6, -13,7};
    int array3[ ] = {-8, -6, -7, 9};
    int array4[ ] = {21, 23, 27,15,0};
    int *t[ ] = { array1, array2, array3, array4};
    display(t);
}
void display(int *tb[ ] )
{
    printf("%d and ", *(tb[1]+1));
    printf("%d", tb[1][2]);
}
```

TTA : 129 Seconds

A) 4 and address of 1<sup>st</sup> element in array1  
B) 4 and -6  
C) 4 and 6  
D) 4 and address of 3<sup>rd</sup> element in array2

20. Which of the below given statements is/are true?  
I. Recursively enumerable languages are countable II.  $\{L = a^p \mid \text{where } p \text{ is prime number}\}$  is not a recursive language.

TTA : 48 Seconds

A) Only I

B) Only II

C) Both I and II

D) None of these

21. In a disk scheduling, request of the track has been made in this order: 30, 17, 40, 9, 97, 20. Disk read/write is located at track 25 of tracks (0 - 99) and moving in the positive direction. What is the total seek distance in which C-SCAN would service these requests?

TTA : 149 Seconds

22. Let  $\delta$  denote the transition function and  $\bar{\delta}$  denote extended transition function of the  $\epsilon$ -NFA whose transition table is given below

$\delta$	a	b	$\epsilon$
$\rightarrow q_0$	$\{q_0\}$	$\{q_1\}$	$\{q_3\}$
$q_1$	$\{q_2\}$	$\{q_3\}$	$\{q_3\}$
$q_2$	$\{q_3\}$	$\phi$	$\phi$
$q_3$	$\phi$	$\phi$	$\{q_0\}$

The  $\bar{\delta}(q_0, bab)$  is

TTA : 166 Seconds

A)  $\phi$

B)  $\{q_0, q_1\}$

C)  $\{q_0, q_1, q_3\}$

D)  $\{q_1, q_2, q_3\}$

23. The single precision IEEE-754 binary floating point representation of a number is 01000000011000000000000000000000. What is the decimal value of the number?

TTA : 108 Seconds

A) 1.5

B) 3.5

C) 1.11

D) 2.22

24. A 64 Gb DRAM chip is organized as  $8 \text{ G} \times 8$  memory externally and as  $256 \text{ K} \times 256 \text{ K}$  square array internally. Refreshing each row takes 20 ns. Each row must be refreshed at least once every 0.05 s. The percentage (rounded to the closet integer) of the time available for performing the memory read/write operations in the main memory unit is \_\_\_\_.

TTA : 134 Seconds

25. Consider the following processors. Assume that the pipeline registers have 0 latency. P1: Five-stage pipeline with stage latencies 3 ns, 2 ns, 4 ns, 2 ns, 1 ns. P2: Six-stage pipeline with stage latencies 4 ns, 3 ns, 5 ns, 1.5 ns, 2 ns, 0.5 ns. P3: Four-stage pipeline with stage latencies 1 ns, 2 ns, 3 ns, 1 ns P4: Four-stage pipeline with stage latencies 2 ns, 3 ns, 4 ns, 1 ns Which processor has the highest clock frequency?

TTA : 62 Seconds

A) P1

B) P2

C) P3

D) P4

26. What of the following is/are true about the FTP protocol? I. It is out-of-band protocol II. It is stateless protocol III. FTP uses TCP at transport layer

TTA : 42 Seconds

A) I and II

B) I and III

C) II and III

D) I, II and III

27. Suppose  $T_1(P, Q)$  and  $T_2(R, S)$  are two relation schemas. Let  $t_1$  and  $t_2$  be the corresponding relation instances.  $R$  is a foreign key that refers to  $P$  in  $T_1$ . If data in  $t_1$  and  $t_2$  satisfy referential integrity constraints,

which of the following is/are always true? I.  $\prod_R(t_2) - \prod_P(t_1) = \Phi$  II.  $\prod_P(t_1) \neq \prod_R(t_2)$  III.  $\prod_P(t_1) - \prod_R(t_2) = \Phi$

TTA : 95 Seconds

- A) Only I  
B) Only I and II  
C) Only II and III  
D) I, II and III

**28.** Consider the below given code. `#include<stdio.h> int fun(int *, int); int main() { int a = 100; int b = 9; fun(&a, b); printf("%d", a - b); return 0; } int fun(int *p, int q) { *p = *p + q; q = 1; }` The output of the above code is \_\_\_\_.

TTA : 80 Seconds

**29.** If  $f(x) = x^3 - 3x - 1$  is continuous in the closed

interval  $\left[\frac{13}{7}, -\frac{11}{7}\right]$  and  $f'(x)$  exists in the open

interval  $\left(\frac{13}{7}, -\frac{11}{7}\right)$  then find the value of  $c$  such

that it lies in  $\left(\frac{13}{7}, -\frac{11}{7}\right)$ ?

TTA : 143 Seconds

- A) -1  
B) 0  
C) 1  
D)  $\pm 1$

**30.** Consider a list of elements 45, 50, 65, 68, 70, 80 and 86 which are inserted into a max-heap. How many swaps will be performed if 68 is changed to 100 in the defined heap to maintain the max-heap property?

TTA : 150 Seconds

**31.** A probability density function on the interval  $[\beta, 2]$  is given by  $\frac{1}{2x^3}$  and outside this interval the value of

function is  $\frac{1}{2}$ . Find the value of  $\beta$  where  $\beta > 0$ .

TTA : 139 Seconds

- A) 1  
B)  $\frac{2}{3}$   
C)  $\frac{3}{4}$   
D)  $\frac{1}{3}$

**32.** Consider Relational schema  $R(ABCDE)$  and Functional Dependency set  $F = \{AB \rightarrow DE, C \rightarrow E, D \rightarrow C, E \rightarrow A\}$

TTA : 117 Seconds

- A) BCNF  
B) 2NF  
C) 3NF  
D) 4NF

**33.**  $G = (\{1, 2, 3, 4, 5, 6\}, \otimes_7)$  is a group which is/are the subgroup of  $G$ ? I.  $(\{1, 2, 3, 4, 5\}, \otimes_7)$  II.  $(\{1, 2, 4\}, \otimes_7)$

TTA : 80 Seconds

- A) Only I  
B) Only II  
C) Both I and II  
D) None of these

**34.** The given input sequence is in descending order and the algorithm that is considered here is to sort the input sequence in ascending order. Which of the following is/are true? I. Merge sort runs in  $O(n^2)$  II. Quick sort runs in  $O(n \times \log_2 n)$  III. Bubble sort runs in  $O(n)$

TTA : 73 Seconds

- A) Only II  
B) Only II and III  
C) I, II and III  
D) None of these

**35.** Let X and Y be the two stations on an Ethernet and both stations have a ready state of frames to send. Both X and Y attempt to transmit a frame after the first collision. What is the probability that neither X nor Y wins?

TTA : 82 Seconds

- A) 0.25  
B) 0.50  
C) 0.625  
D) 1

**36.** Which one of the following is a closed form expression for the generating function of the sequence  $\{a_n\}$ , where  $a_n = 3n + 5$  for all  $n = 0, 1, 2, 3, \dots$ ?

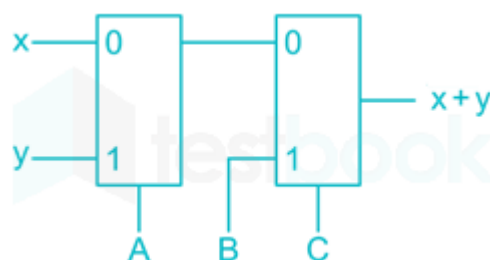
TTA : 150 Seconds

- A)  $\frac{5-3x}{(1-x)^3}$   
B)  $\frac{5-3x}{(1-x)^2}$   
C)  $\frac{5-2x}{(1-x)^2}$   
D)  $\frac{5-2x}{(1-x)^3}$

**37.** Consider a 5-stage pipeline are 3, 5, 8, 2 and 4 nanoseconds in which 1<sup>st</sup> stage is with 3 nanosecond, 2<sup>nd</sup> stage is with 5 nano seconds and so on. The third stage is replaced with a functionally equivalent design involving two stages with 5 and 4 nanoseconds respectively. The throughput increase of the pipeline is \_\_\_\_\_ percent.

TTA : 159 Seconds

**38.** Consider the circuit shown below implement two input a 2- input OR gate using 2: 1 MUX. What are the values of signals A, B and C respectively?



TTA : 259 Seconds

- A) x, 0, y  
B) y, 0, x  
C) x, 1, y  
D) y, 1, x

**39.** Construct a B tree with given keys as below of order 4. Keys are 2, 5, 10, 1, 6, 9, 4, 3, 12, 18, 20. The number of splits that incurred during construction of the B tree is \_\_\_\_\_.

TTA : 159 Seconds

**40.** Consider a 4-bit Johnson counter with an initial value 0010. If  $Q_3$  is MSB and  $Q_0$  is LSB, also  $\bar{Q}_3$  is given as input to  $Q_0$  and  $Q_0$  is input to  $Q_1$  and so on then what is the counting sequence of the given counter?

TTA : 186 Seconds

- A) 2, 5, 11, 6, 10, 13, 4, 9, 2 ...  
B) 2, 5, 11, 6, 13, 10, 9, 4, 2 ...  
C) 2, 5, 11, 6, 13, 10, 4, 9, 2 ...  
D) 2, 5, 11, 6, 10, 13, 9, 4, 2 ...

**41.** Processes P1, P2, P3 and P4 run on a single processor. Arrival time of processes P1, P2, P3 and P4 are 1, 3, 3 and 5 ms respectively while computation

time of P1, P2, P3 and P4 are 2, X, 5 and 7 ms respectively. Algorithm used by processor for processing is Shortest Job First. If the average time turnaround time is  $13/2$  ms then the value of X is \_\_\_\_\_ ms (computation time of P2 is less than P4).

TTA : 295 Seconds

42.

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

Which of the following is true for the above-given resource allocation table?

TTA : 156 Seconds

- A) The system is in safe state
- B) The system is in unsafe state
- C) The system is in deadlock
- D) Insufficient Information

43. Consider an IP packet with a data length of 4400 bytes. TCP header is of 40 bytes while that of IPv4 header is 20 bytes. The packet is forwarded to an IPv4 router that supports MTU of 900 bytes. Length of the IP header for outgoing fragments is 20 bytes. Assume that the fragment offset value stored in the first fragment is 100. The fragmentation offset value of the penultimate fragment is \_\_\_\_\_.

TTA : 149 Seconds

44. Consider the following relational schema for students(STU):

id	name	age	marks
1	PPP	13	56
2	QQQ	14	67
3	RRR	13	76
4	AAA	15	56
5	BBB	14	58
6	CCC	16	79
7	SSS	16	80
8	TTT	13	73
9	RRR	14	54
10	YYY	15	42

The following query is made on the database.  $T_1 \rightarrow$

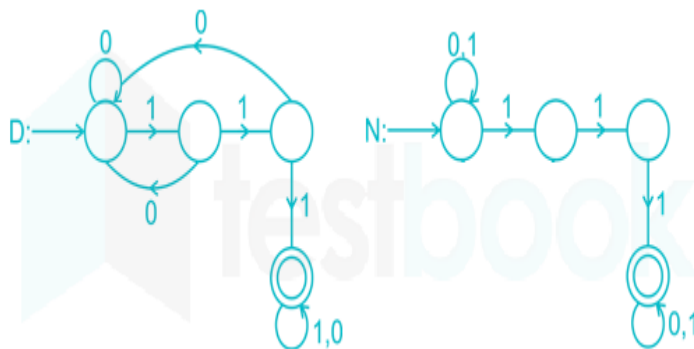
$$\Pi_{id, name}(\sigma_{age > 13 \wedge age < 16}(STU)) T_2 \rightarrow$$

$$\Pi_{id, name}(\sigma_{marks > 55 \wedge marks < 66}(STU)) T \rightarrow T_2 - T_1$$

The total no. of rows in T is \_\_\_\_\_.

TTA : 142 Seconds

45. Consider the following two finite automata. D accepts  $L_1$  and N accepts  $L_2$ . Which of the following is true?



TTA : 123 Seconds

- A)  $L_1 \cap L_2 = \phi$
- B)  $L_1 \cup L_2 \neq L_1$
- C)  $L_1 \cup L_2 \neq L_2$
- D)  $L_1 = L_2$

46. A circuit outputs a digit in the form of 4 bits. 0 is represented by 0000, 1 by 0001, ..., 9 by 1001. A combinational circuit is to be designed which takes these 4 bits as input and outputs 1 if the digit  $\geq 6$ , and 0 otherwise. What is the minimum number of NOR gates required?

TTA : 188 Seconds

47. Consider a sequence of 14 elements:  $A = [-5, -10, 6, 3, -1, -2, 13, 4, -9, -1, 4, 12, -3, 0]$ . The subsequence sum  $S(i, j) = \sum_{k=i}^j A[k]$ . Determine the maximum of  $S(i, j)$ , where  $0 \leq i \leq j < 14$ . (Divide and conquer approach may be used.)

TTA : 122 Seconds

48. Let A be recursively enumerable language which is not recursive and  $A'$  be its complement, also B be recursive language and  $B'$  be its complement. Let X and Y be two languages such that  $A'$  reduces to X and Y reduces to  $B'$  and the reduction is many to one. Which of the following is/are true? I. X can be recursively enumerable language II. X is not recursively enumerable language III. Y is recursive language IV. Y may or may not be recursive language

TTA : 108 Seconds

- A) I and III
- B) I and IV
- C) II and III
- D) II and IV

49. Let the number of times 'for' loop runs successfully be x and the output printed by variable 'add' for the below given code be y. #include<stdio.h>

```
static int a = 14;
int ary() {
    return a--;
}
int main () {
    int add = 1;
    int i = 0;
    for(ary(); a++; ary())
        add = add + ary();
    printf("%d", add);
    return 0;
}
```

The value of  $x \times y$  is \_\_\_\_\_.

TTA : 263 Seconds

50. Consider three machines A, B, and C with IP addresses 200.175.168.1, 200.175.168.5, and 200.175.168.7 respectively. The subnet mask is set to 255.255.255.248 for all the three machines. Which one of the following is true?



TTA : 101 Seconds

- A) A, B, and C all belong to the same subnet  
 B) A and B belong to the same subnet but not C  
 C) C and D belong to the same subnet but not A  
 D) A, B, and C belong to three different subnets

**51.** In an RSA cryptosystem, the value of the public modulus parameter  $n$  is 15251. If it is also known that  $\phi(n) = 15000$ , where  $\phi()$  denotes Euler's Totient Function, then the smallest prime factor of  $n$  is \_\_\_\_\_.  
 (Hint: one of the prime factors of  $n$  is less than 200 and greater than 150)

TTA : 168 Seconds

**52.** The size of the physical address space of a processor is  $2^a$  bytes. The word length is  $2^b$  bytes. The capacity of cache memory is  $C$  words. The size of the block is  $2^d$  words. For a  $2^k$ -way set-associative cache memory, the length of the tag field in bits is.

TTA : 218 Seconds

- A)  $a - b - c + k + \log_2 C$   
 B)  $a - b - d + k + \log_2 C$   
 C)  $a + k - \log_2 C$   
 D)  $a - b + k - \log_2 C$

**53.** Consider the following stack operation along with push and pop instructions which sort the stack 'a' using temporary stack 'temp'. while (!a.empty()) {  
     int x = a.top();      a.pop();      while  
 (!temp.empty() && temp.top() > x) {  
     a.push(temp.top());      temp.pop();      }  
 temp.push(x); } Calculate the total number of pop operations performed to sort the stack of integers 27 12 20 33 16. (16 is the top element on a stack)

TTA : 272 Seconds

**54.** Consider the augmented grammar given below:  
 $A' \rightarrow A A \rightarrow a X b \mid c \mid d X X \rightarrow f^+ A \mid A$  Let,  $I_0 = \text{CLOSURE}(\{[A' \rightarrow \cdot A]\})$ . The number of items in the set  $\text{GOTO}(I_0, a)$  is: \_\_\_\_\_

TTA : 88 Seconds

**55.** Consider a matrix  $M = \begin{bmatrix} 1 & 2 \\ 2 & 4 \end{bmatrix}$  if one of the

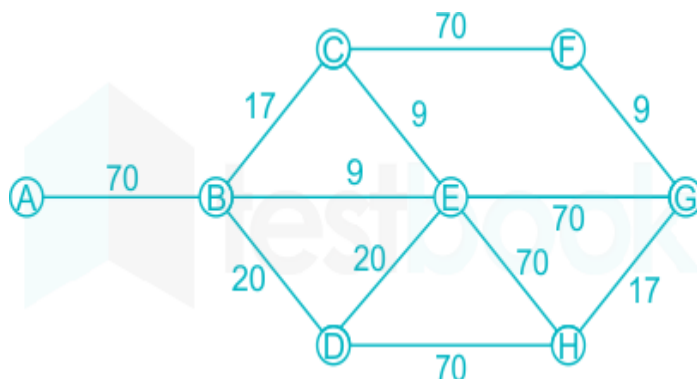
eigenvectors is  $\begin{bmatrix} -2 \\ 1 \end{bmatrix}$  then what is the other vector

the given matrix M?

TTA : 150 Seconds

- A)  $\begin{bmatrix} 2 \\ 1 \end{bmatrix}$   
 B)  $\begin{bmatrix} 2 \\ -1 \end{bmatrix}$   
 C)  $\begin{bmatrix} 1 \\ 2 \end{bmatrix}$   
 D)  $\begin{bmatrix} -1 \\ 2 \end{bmatrix}$

**56.** Consider the below given graph.



The total number of minimum spanning tree is \_\_\_\_\_.

TTA : 136 Seconds

**57.** A processor has 68 distinct instruction and 35 general purpose registers. A 32-bit instruction word has an opcode, two register operands and an immediate operand. What is least value possible of the immediate operand if operand is in 2's complement?

TTA : 110 Seconds

**58.** The pre-order traversal of a binary search tree is given by 40, 30, 20, 25, 72, 90, 80. Consider the following New-traversal strategy for traversing the given binary tree: 1. Visit the right subtree using New-traversal; 2. Visit the root; 3. Visit the left subtree using New-traversal; The New-traversal sequence of the given tree is given by:

TTA : 150 Seconds

- A) 80, 90, 72, 40, 25, 20, 30 B) 90, 80, 72, 40, 30, 25, 20  
 C) 25, 20, 30, 40, 80, 90, 72 D) 72, 80, 90, 40, 25, 20, 30

**59.** A computer has 30 physical page frame initially contains page number 201 through 230. Now a program accesses the pages number 1, 2, 3 ... 50 in same order and repeat the sequence thrice. What is the number page hits if optimal page replacement is used?

TTA : 194 Seconds

**60.** Consider the following languages:  $L_1 = a^p \mid$  where  $p$  is a multiple of 5  $L_2 = a^n b^{3n} c^m \mid n \geq 1$  and  $m \geq 1$   $L_3 = a^m b^p c^n d^q \mid m = p$  and  $n = q$  where  $m, n, p, q \geq 0$   $L_4 = a^m b^p c^n d^q \mid m = n$  or  $p = q$  where  $m, n, p, q \geq 0$  Which of the following are correct? I.  $L_1$  is a context free language II.  $L_2$  can be accepted by deterministic pushdown automaton III.  $L_3$  is a context free language IV.  $L_4$  is a deterministic context free language

TTA : 101 Seconds

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

**61.** Consider the set  $A = \{1, 2, 3, 6, 9, 18\}$  under the partial ordering  $R = \{(1, 1), (1, 2), (1, 3), (1, 6), (1, 9), (1, 18), (2, 2), (2, 6), (2, 18), (3, 3), (3, 6), (3, 9), (3, 18), (6, 6), (6, 18), (9, 9), (18, 18)\}$  The minimum number of ordered pairs that need to be added to  $R$  to make  $(X, R)$  a lattice is \_\_\_\_\_

TTA : 127 Seconds

**62.** Consider four matrices, P, Q, R and S of dimensions  $a \times b$ ,  $b \times c$ ,  $c \times d$  and  $d \times e$  respectively which can be multiplied in several ways. Example,

total number of scalar multiplication needed for  $((PQ)R)S = a \times b \times c + a \times c \times d + a \times d \times e$ . The minimum number of scalar multiplications needed if  $a = 2$ ,  $b = 5$ ,  $c = 2$ ,  $d = 7$  and  $e = 2$  is \_\_\_\_\_.

TTA : 181 Seconds

63. Let  $A = \begin{pmatrix} 1 & 2 & -3 & 4 \\ 2 & 5 & -2 & 1 \\ 5 & 12 & -7 & 6 \end{pmatrix}$ . consider the

system of equation  $A \begin{pmatrix} x \\ y \\ z \\ t \end{pmatrix} = \begin{pmatrix} 2 \\ 1 \\ 7 \end{pmatrix}$  Then the rank of

A is

TTA : 154 Seconds

- A) 3 and the above system has a solution
- B) 3 and the above system has NO solution
- C) 2 and the above system has a solution
- D) 2 and the above system has NO solution

64. Consider a two dimensional array  $X[-10 \dots 5, 7 \dots 15]$  in which starting location is at 250. If every data of given array takes 4 byte of space and store in column major order, then what will be the location of  $A[2][10]$

TTA : 174 Seconds

65. Consider three data items A, B, and C, and the following execution schedule of transactions  $T_1$ ,  $T_2$ , and  $T_3$ . In the diagram,  $R(A)$ ,  $R(B)$ , and  $R(C)$  denotes read operation on data item A, B and C respectively while  $W(A)$ ,  $W(B)$ , and  $W(C)$  denotes the write operation on data item on A, B and C respectively.

$T_1$	$T_2$	$T_3$
	$R(A)$	
$R(B)$		
	$W(C)$	
		$R(C)$
$W(B)$		
		$R(B)$
$R(A)$		
		$w(A)$
	$R(B)$	

TTA : 112 Seconds

- A) The schedule is both view serializable and conflict serializable
- B) The schedule is conflict serializable but not view serializable
- C) The schedule is view serializable but not conflict serializable
- D) The schedule is neither view serializable and nor conflict serializable

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## Smart Answer Key

**Correct %** - Indicates percentage of students who answered Question Correctly.

**Skipped %** - Indicates percentage of students who Skipped Question.

👉 Easy 🧠 Tricky ★ Difficult

Q.	Ans	Correct Skipped	Q.	Ans	Correct Skipped	Q.	Ans	Correct Skipped	Q.	Ans	Correct Skipped	Q.	Ans	Correct Skipped	Q.	Ans	Correct Skipped
1	C	61% 36%	16		17% 28%	31	B	43% 54%	46		48% 31%	61		42% 27%			
2	C	57% 9%	17	D	79% 6%	32	C	76% 9%	47		62% 19%	62		50% 32%			
3	C	30% 55%	18		77% 8%	33	B	65% 24%	48	C	61% 25%	63	D	35% 36%			
4	D	70% 10%	19	C	67% 16%	34	D	80% 6%	49		7% 48%	64		38% 22%			
5	B	68% 20%	20	A	61% 18%	35	B	49% 16%	50	A	80% 13%	65	A	73% 21%			
6	B	3% 66%	21		49% 16%	36	C	52% 44%	51		44% 44%						
7	C	56% 35%	22	C	46% 23%	37		39% 28%	52	D	42% 35%						
8	B	16% 32%	23	B	59% 30%	38	D	66% 18%	53		17% 56%						
9	A	65% 30%	24		17% 67%	39		56% 19%	54		65% 21%						
10	A	26% 40%	25	C	76% 17%	40	C	65% 31%	55	C	40% 34%						
11	D	87% 5%	26	B	65% 19%	41		52% 26%	56		42% 19%						
12	C	34% 37%	27	A	69% 14%	42	A	76% 16%	57		51% 27%						
13	C	84% 8%	28		89% 8%	43		14% 50%	58	B	77% 14%						
14		82% 4%	29	D	46% 46%	44		66% 10%	59		24% 30%						
15	D	53% 18%	30		24% 11%	45	D	74% 12%	60	C	72% 12%						

## Performance Analysis

	General Aptitude	Computer Science and Information Technology	Overall
Avg. Score	5/ 15	41/ 85	46/100
Toppers Score	0/ 15	-15/ 85	-15/100
Cut Off	Not Required	Not Required	29 / 100
Your Score			

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