Andhra Pradesh State Council of Higher Education

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

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Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
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Computer Science and Information Technology

Section Id :	87371810
Section Number :	1
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Number of Questions :	120
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Enable Mark as Answered Mark for Review and Clear Response :	Yes

Question Number : 1 Question Id : 8737181081 Display Question Number : Yes Is Question Mandatory : No

Suppose Y is distributed uniformly in the open interval (1,6). The probability that the polynomial $3x^2 + 6xY + 3Y + 6$ has only real roots is
(rounded off to 1 decimal place) _____.

Options :

1. ✖ 0.2

2. ✖ 0.7

3. ✖ 0.1

4. ✔ 0.8

Question Number : 2 Question Id : 8737181082 Display Question Number : Yes Is Question Mandatory : No

Consider the first order predicate formula φ :

$$\forall X[(\forall Z\ S|X \Rightarrow ((Z = X) \vee (Z = 1))) \Rightarrow \exists W(W > X) \wedge (\forall Z\ Z|W \Rightarrow ((W = Z) \vee (Z = 1)))]$$

Here 'a|b' denotes that 'a divides b', where a and b are integers. Consider the following sets :

S1. {1,2,3,…,100}

S2. Set of all positive integers

S3. Set of all integers

Which of the above sets does not satisfy φ

Options :

1. ✖ S2 and S3

2. ✔ S1

3. ✖ S2

4. ✖ S3

Question Number : 3 Question Id : 8737181083 Display Question Number : Yes Is Question Mandatory : No

Let G be an undirected complete graph on n vertices, where n>2. Then, the number of different Hamiltonian cycles in G is equal to ___

Options :

1. ✖ n!

2. ✖ 1

3. ✖ (n!-1)

4. ✔ (n-1)!/2

Question Number : 4 Question Id : 8737181084 Display Question Number : Yes Is Question Mandatory : No

Let G be a group of 35 elements. Then the largest possible size of a subgroup of G other than G itself is ____

Options :

1. ✔ 7

2. ✖ 5

3. ✖ 4

4. ✖ 3

Question Number : 5 Question Id : 8737181085 Display Question Number : Yes Is Question Mandatory : No

Graph G is obtained by adding vertex s to $K_{3,4}$ and making s adjacent to every vertex of $K_{3,4}$. The minimum number of colours required to edge colour G is _____

Options :

1. ✖ 12

2. ✔ 7

3. ✖ 6

4. ✖ 3

Question Number : 6 Question Id : 8737181086 Display Question Number : Yes Is Question Mandatory : No

Let G be a graph with 100! Vertices, with each vertex labelled by a distinct permutation of the numbers 1, 2, …, 100. There is an edge between vertices u and v if and only if the label of u can be obtained by swapping two adjacent numbers in the label of v. Let y denote the degree of a vertex in G, and z denote the number of connected components in G. Then, y + 10z = _____.

Options :

1. ✔ 109

2. ✖ 108

3. ✖ 110

4. ✖ 114

Question Number : 7 Question Id : 8737181087 Display Question Number : Yes Is Question Mandatory : No

Consider the following recurrence relation $T(n) = 4T(n-1) - 3T(n-2)$, $T(0)=0, T(1)=2$. What is the solution of $T(n)$?

Options :

1. ✖ 3^n+4^n

2. ✔ 3^n-1

3. ✖ 4^n-1

4. ✖ 3^n-4^n

Question Number : 8 Question Id : 8737181088 Display Question Number : Yes Is Question Mandatory : No

The function f is mapped from natural numbers to integer numbers and $f(x) = x^2 - 2x+3$.
Consider N={0,1,2,3,...} and Z= {...,-2,-1,0,1,2,...}. What is the function f ?

Options :

1. ✖ Injective function

2. ✖ Surjective function

3. ✖ Bijective function

4. ✔ Neither surjective nor injective

Question Number : 9 Question Id : 8737181089 Display Question Number : Yes Is Question Mandatory : No

The number of ways of arranging the letters CCCCCOOOVVVIDDP in a row when no two V's are together is ____

Options :

1. ✖ $\frac{12!}{5!3!2!} \times {}^{13}P_3$

2. ✔ $\frac{12!}{5!3!2!} \times ({}^{13}P_3/3!)$

3. ✖ $\frac{15!}{5!3!2!} - \frac{13!}{5!3!2!}$

4. ✖ $\frac{15!}{5!3!3!2!} - 3!$

Question Number : 10 Question Id : 8737181090 Display Question Number : Yes Is Question Mandatory : No

Consider the following are five statements

A : If T is a right triangle then $a^2 + b^2 = c^2$.

B : If $a^2 + b^2 = c^2$ then T is a right triangle.

C : If $a^2 + b^2 \neq c^2$ then T is not a right triangle.

D : T is a right triangle only if $a^2 + b^2 = c^2$.

E : T is a right triangle unless $a^2 + b^2 = c^2$.

Then an equivalent statement for "A sufficient condition that a triangle T be a right triangle is that $a^2 + b^2 = c^2$" is

Options :

1. ✖ A and B only

2. ✖ A ,B and C only

3. ✔ B only

4. ✖ B,E only

Question Number : 11 Question Id : 8737181091 Display Question Number : Yes Is Question Mandatory : No

Let N be the set of natural numbers. Consider the following sets,

P: Set of Rational numbers (positive and negative)

Q: Set of functions from {0, 1} to N

R: Set of functions from N to {0, 1}

S: Set of finite subsets of N

Which of the above sets are not countable?.

Options :

1. ✖ Q and S only

2. ✖ P and S only

3. ✔ R only

4. ✖ P,Q and S only

Question Number : 12 Question Id : 8737181092 Display Question Number : Yes Is Question Mandatory : No

Which of the following is the contrapositive of the following $(R \wedge S) \rightarrow (\sim P \wedge Q)$.

Options :

1. ✖ $(\sim P \wedge Q) \rightarrow (R \wedge S)$

2. ✖ $(R \wedge S) \rightarrow (P \vee \sim Q)$

3. ✔ $(P \vee \sim Q) \rightarrow (\sim R \vee \sim S)$

4. ✖ $(\sim R \vee \sim S) \rightarrow (P \vee \sim Q)$

Question Number : 13 Question Id : 8737181093 Display Question Number : Yes Is Question Mandatory : No

Consider the first-order logic sentence $\varphi \equiv \exists s\ \exists t\ \exists u\ \forall v\ \forall w\ \forall x\ \forall y\ \psi(s,t,u,v,w,x,y)$ where $\psi(s,t,u,v,w,x,y)$ is a quantifier-free first-order logic formula using only predicate symbols, and possibly equality, but no function symbols. Suppose φ has a model with a universe containing 7 elements. Which one of the following statements is necessarily true?

Options :

1. ✖ There exists at least one model of φ with universe of size less than or equal to 3.

2. ✔ There exists no model of φ with universe of size less than or equal to 3.

3. ✖ There exists no model of φ with universe of size greater than 7.

4. ✖ Every model of φ has a universe of size equal to 7

Question Number : 14 Question Id : 8737181094 Display Question Number : Yes Is Question Mandatory : No

The statement $(\neg p) \Rightarrow (\neg q)$ is logically not equivalent to which of the statements below?

A: $p \Rightarrow q$;
B: $q \Rightarrow p$;
C : $(\neg q) \vee p$;
D : $(\neg p) \vee q$

Options :

1. ✖ A only

2. ✔ A and D only

3. ✖ B only

4. ✖ B and C only

Question Number : 15 Question Id : 8737181095 Display Question Number : Yes Is Question Mandatory : No

Which of the following is a solved conjecture?
(a) $\forall\, m \in N\,, \exists\, n \geq m,\, n$ odd, $\exists\, p, q \in P,\, n = p + q$
(b) $\forall\, m \in N\,, \exists\, n \geq m,\, n \in P$ and $n + 2 \in P$
(c) $\forall\, m \in N\,, \exists\, n \geq m,\, 2^{2n} + 1 \in P$
(d) $\forall k \in N\,, \exists\, p \in P,\, p \geq k\,,\, 2p - 1 \in P$

Options :

1. ✔ (a) only

2. ✖ (a) and (b) only

3. ✖ (a) and (c) only

4. ✖ (b) and (c) only

Question Number : 16 Question Id : 8737181096 Display Question Number : Yes Is Question Mandatory : No

The number of flip-flops needed to construct a binary modulo N counter is

Options :

1. ✖ N

2. ✖ 2^N

3. ✖ N^2

4. ✔ log_2^N

Question Number : 17 Question Id : 8737181097 Display Question Number : Yes Is Question Mandatory : No

What is the minimum number of 2-input NOR gates required to implement a 4 – variable function expressed in sum-of-minterms form as f=∑(0,2,5,7,8,10,13,15) ? Assume that all the inputs and their complements are available.

Options :

1. ✖ 2

2. ✖ 4

3. ✖ 7

4. ✔ 3

Question Number : 18 Question Id : 8737181098 Display Question Number : Yes Is Question Mandatory : No

If there are m input lines and n output lines for a decoder that is used to uniquely address a byte addressable 1KB RAM, then the minimum value of m+n is _____

Options :

1. ✔ 1034

2. ✖ 1024

3. ✖ 210

4. ✖ 10

Question Number : 19 Question Id : 8737181099 Display Question Number : Yes Is Question Mandatory : No

The n-bit fixed-point representation of an unsigned real number X uses f bits for the fraction part. Let i=n-f. The range of decimal values for X in this representation is

Options :

1. ✖ 2^{-f} to 2^{i}

2. ✖ 2^{-f} to $(2^{i}-2^{-f})$

3. ✖ 0 to 2^{i}

4. ✔ 0 to $(2^{i}-2^{-f})$

Question Number : 20 Question Id : 8737181100 Display Question Number : Yes Is Question Mandatory : No

A multiplexer is placed between a group of 32 registers and an accumulator to regulate data movement such that at any given point in time the content of only one register will move to the accumulator. The minimum number of select lines needed for the multiplexer is _____

Options :

1. ✖ 4

2. ✖ 6

3. ✖ 8

4. ✔ 5

Question Number : 21 Question Id : 8737181101 Display Question Number : Yes Is Question Mandatory : No

Consider a disk pack with a seek time of 4 milli seconds and rotational speed of 10000 rotations per minute. It has 600 sectors per track and each sector can store 512 bytes of data. Consider a file stored in the disk. The file contains 2000 sectors. Assume that every sector access necessitates a seek, and the average rotational latency for accessing each sector is half of the time for one complete rotation. The total time needed to read the entire file is _____

Options :

1. ✔ 14020

2. ✖ 14021

3. ✖ 14022

4. ✖ 14023

Question Number : 22 Question Id : 8737181102 Display Question Number : Yes Is Question Mandatory : No

In a k-way set associative cache, the cache is divided into v sets, each of which consists of k lines. The lines of a set are placed in sequence one after another. The lines in set s are sequenced before the lines in set (s+1). The main memory blocks are numbered 0 onwards. The main memory block numbered j must be mapped to any one of the cache lines from_____

Options :

1. ✔ (j mod v) * k to (j mod v) * k + (k-1)

2. ✖ (j mod v) to (j mod v) + (k-1)

3. ✖ (j mod k) to (j mod k) + (v-1)

4. ✖ (j mod k) * v to (j mod k) * v + (v-1)

Question Number : 23 Question Id : 8737181103 Display Question Number : Yes Is Question Mandatory : No

Consider the following sequence of micro-operation.
MBR← PC
MAR←X
PC←Y
Memory←MBR
Which one of the following is possible operation performed by this sequence?

Options :

1. ✖ Instruction fetch

2. ✖ Operand fetch

3. ✖ Conditional branch

4. ✔ Initiation of interrupt service

Question Number : 24 Question Id : 8737181104 Display Question Number : Yes Is Question Mandatory : No

Register renaming is done in pipelined processors

Options :

1. ✖ as an alternative to register allocation at compile time

2. ✖ for efficient access to function parameters and local variables

3. ✔ to handle certain kinds of hazards

4. ✖ as part of address translation

Question Number : 25 Question Id : 8737181105 Display Question Number : Yes Is Question Mandatory : No

A CPU generally handles an interrupt by executing an interrupt service routine

Options :

1. ✖ As soon as an interrupt is raised.

2. ✖ By checking the interrupt register at the end of fetch cycle.

By checking the interrupt register after finishing the execution of the current instruction.

3. ✔

4. ✖ By checking the interrupt register at fixed time intervals.

Question Number : 26 Question Id : 8737181106 Display Question Number : Yes Is Question Mandatory : No

For a magnetic disk with concentric circular tracks, the seek latency is not linearly proportional to the seek distance due to____

Options :

1. ✖ non-uniform distribution of requests

2. ✔ arm starting and stopping inertia

3. ✖ higher capacity of tracks on the periphery of the platter

4. ✖ use of unfair arm scheduling policies

Question Number : 27 Question Id : 8737181107 Display Question Number : Yes Is Question Mandatory : No

Which of the following is/are false of the auto-increment addressing mode?
A. It is useful in creating self-relocating code
B. If it is included in an Instruction Set Architecture, then an additional ALU is required for effective address calculation
C. The amount of increment depends on the size of the data item accessed

Options :

1. ✖ A only

2. ✖ B only

3. ✖ C only

4. ✔ A and B only

Question Number : 28 Question Id : 8737181108 Display Question Number : Yes Is Question Mandatory : No

Consider the following processors (ns stands for nanoseconds). Assume that the pipeline registers have zero latency. P1: Four-stage pipeline with stage latencies 1 ns, 2 ns, 2 ns, 1 ns. P2: Four-stage pipeline with stage latencies 1 ns, 1.5 ns, 1.5 ns, 1.5 ns. P3: Five-stage pipeline with stage latencies 0.5 ns, 1 ns, 1 ns, 0.6 ns, 1 ns. P4: Five-stage pipeline with stage latencies 0.5 ns, 0.5 ns, 1 ns, 1 ns, 1.1 ns. Which processor has the highest peak clock frequency?

Options :

1. ✖ P1

2. ✖ P2

3. ✔ P3

4. ✖ P4

Question Number : 29 Question Id : 8737181109 Display Question Number : Yes Is Question Mandatory : No

The value of a float type variable is represented using the single-precision 32-bit floating point format of IEEE-754 standard that uses 1 bit for sign, 8 bits for biased exponent and 23 bits for mantissa. A float type variable X is assigned the decimal value of −14.25. The representation of X in hexadecimal notation is__

Options :

1. ✔ C1640000H

2. ✖ 416C0000H

3. ✖ 41640000H

4. ✖ C16C0000H

Question Number : 30 Question Id : 8737181110 Display Question Number : Yes Is Question Mandatory : No

Assume that for a certain processor, a read request takes 50 nanoseconds on a cache miss and 5 nanoseconds on a cache hit. Suppose while running a program, it was observed that 80% of the processors read requests result in a cache hit. The average and access time in nanoseconds is _____.

Options :

1. ✔ 14

2. ✖ 15

3. ✖ 16

4. ✖ 17

Question Number : 31 Question Id : 8737181111 Display Question Number : Yes Is Question Mandatory : No

What is the output of the following program?

```
main()
{
char a[]="Hello World";
printf("%s", a+1);
}
```

Options :

1. ✔ ello World

2. ✖ Hello World

3. ✖ Compile Time Error

4. ✖ e

Question Number : 32 Question Id : 8737181112 Display Question Number : Yes Is Question Mandatory : No

What is the problem in following variable declaration?
float 3Balcony-PujaRoom-Kitchen?;

Options :

1. ✖ The variable name begins with an integer

2. ✖ The variable name begins with an integer and having the special character '-' and no issue with a special character'?'.

3. ✔

The variable name begins with an integer and having the special character '-' and a special character '?'

4. ✖ Having the special character '-' and '?'

Question Number : 33 Question Id : 8737181113 Display Question Number : Yes Is Question Mandatory : No

On a machine where pointers are 4 bytes long, what happens when the following code is executed?

```
main()
{
int x=0, *p=0;
x++;
p++;
printf("%d and %d \n",x, p);
}
```

Options :

1. ✔ 1 and 4 is printed

2. ✖ Causes an exception

3. ✖ 1 and 1 is printed

4. ✖ 4 and 4 is printed

Question Number : 34 Question Id : 8737181114 Display Question Number : Yes Is Question Mandatory : No

Consider the code below and select the correct option(s)

```
#include <stdio.h>
int main()
{
 int number1,number2;
scanf("%d%d",&number1,&number2);
if(number1%number2==0 || number2%number1==0)
printf("The numbers satisfy the property");
else
printf("The numbers do not satisfy the property");
return 0;
}
```

Which of the following input sequences will print the text – "The numbers satisfy the property"

[Note: there is space between any two 2-digit number inputs]

Options :

1. ✔ 51 13 and 52 13

2. ✖ 52 13 and 17 51

3. ✖ 17 51 and 17 52

4. ✖ 17 52 and 52 13

Question Number : 35 Question Id : 8737181115 Display Question Number : Yes Is Question Mandatory : No

Consider the Five items: P, Q, R, S and T are pushed into a stack, one after the other starting from P. The stack is popped four times and each element is inserted in a queue. Then two elements are deleted from queue and pushed back into the stack. Now one item is popped from the stack. The popped item is

Options :

1. ✖ P

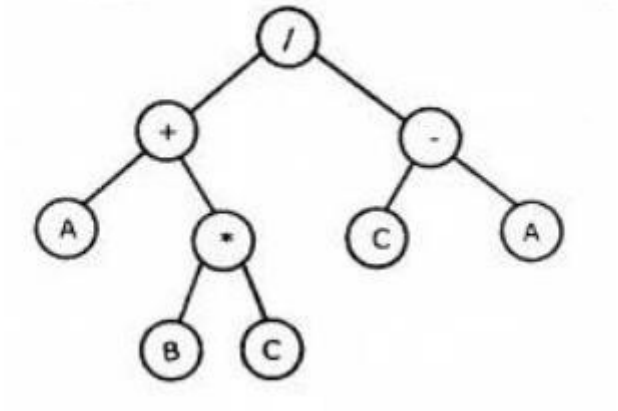
2. ✖ Q

3. ✖ R

4. ✔ S

Question Number : 36 Question Id : 8737181116 Display Question Number : Yes Is Question Mandatory : No

The expression for the following binary tree is



Options :

1. ✔ (A+B*C)/(C-A)

2. ✖ (B*C+A)-(C/A)

3. ✖ (B+C*A)/(A-C)

4. ✖ /+-AC CA*B

Question Number : 37 Question Id : 8737181117 Display Question Number : Yes Is Question Mandatory : No

The worst case time complexity for searching an element in a binary search tree with 'n' elements is

Options :

1. ✖ O(log n)

2. ✖ O(n log n)

3. ✖ O(log log n)

4. ✔ O(n)

Question Number : 38 Question Id : 8737181118 Display Question Number : Yes Is Question Mandatory : No

In stack, the data item placed on the stack first is

Options :

1. ✔ The last item to be removed

2. ✖ The first data item to be removed

3. ✖ Not given an index number

4. ✖ Given an index n/2.

Question Number : 39 Question Id : 8737181119 Display Question Number : Yes Is Question Mandatory : No

If the number of nodes in a binary search tree is 16, then the minimum height of the tree is

Options :

1. ✔ 4

2. ✖ 3

3. ✖ 5

4. ✖ 16

Question Number : 40 Question Id : 8737181120 Display Question Number : Yes Is Question Mandatory : No

Which of the following is/are application(s) of stack data structure?

Options :

1. ✔ Recursive function call

2. ✖ Expression evaluation

3. ✖ Airline reservation system

4. ✖ Indexing in database

Question Number : 41 Question Id : 8737181121 Display Question Number : Yes Is Question Mandatory : No

If $T(n) = 2T\binom{n}{2} + n\log n$ for $n \geq 2$ and $T(1) = 0$, then $T(n)$ is

Options :

1. ✖ $O(n)$

2. ✖ $O(n\log n)$

3. ✔ $O(n(\log n)^2)$

4. ✖ $O(n^2)$

Question Number : 42 Question Id : 8737181122 Display Question Number : Yes Is Question Mandatory : No

Consider a hash table T of size n. Assume chaining is used to resolve collisions and each bucket of hash table uses the following procedure to implement chaining:
Uses single linked list
Maintains head and tail pointers to point first & last elements respectively
Element is inserted at the beginning if it is smaller than the first element of linked list , otherwise inserted at the end of the list .
What is the worst case time complexity to insert an element into hash table?

Options :

1. ✔ $O(1)$

2. ✖ $O(\log n)$

3. ✖ $O(n)$

4. ✖ $O(n\log n)$

Question Number : 43 Question Id : 8737181123 Display Question Number : Yes Is Question Mandatory : No

Consider a modification of the insertion-sort algorithm, which performs a binary search instead of sequential to find the position where the element to be inserted in each pass of the algorithm. What is the worst case running time of this algorithm?

Options :

1. ✖ $O(n)$

2. ✖ $O(nlogn)$

3. ✔ $O(n^2)$

4. ✖ $O(n^2logn)$

Question Number : 44 Question Id : 8737181124 Display Question Number : Yes Is Question Mandatory : No

Consider two arrays A and B which are integer type. Array A has n distinct values and array B also has n distinct values, but A and B may have some common values. What is the worst case running time to compute A-B?

Options :

1. ✖ $O(n)$

2. ✔ $O(nlogn)$

3. ✖ $O(n^2)$

4. ✖

$O(n^2 \log n)$

Question Number : 45 Question Id : 8737181125 Display Question Number : Yes Is Question Mandatory : No

Let $T(n)=T(n-1)+1/n$. Then $T(n)$ is

Options :

1. ✖ $\Theta(1)$

2. ✔ $\Theta(\log n)$

3. ✖ $\Theta(\log \log n)$

4. ✖ $\Theta(n)$

Question Number : 46 Question Id : 8737181126 Display Question Number : Yes Is Question Mandatory : No

Choose the invalid statement from the following?

Options :

1. ✖ A graph can have more than one shortest path between two vertices

2. ✖ A graph where all edge weights are distinct can have more than one shortest path between two vertices

3. ✔ Multiplying all edge weights by a positive number might change the graph's minimum spanning tree

4. ✖ Both option 2 and option 3

Question Number : 47 Question Id : 8737181127 Display Question Number : Yes Is Question Mandatory : No

Assume a graph G has negative weight edges with no cycles.Which of the following statement is correct if the Dijkstra's algorithm is applied on G ?

Options :

1. ✖ Always produces correct results

2. ✖ Always produces incorrect results

3. ✔ It always terminates but may produce incorrect results

4. ✖ It will not terminate.

Question Number : 48 Question Id : 8737181128 Display Question Number : Yes Is Question Mandatory : No

Which of the following can be solved using Master theorem ?

Options :

1. ✖ $T(n) = 2.T\left(\frac{n}{2}\right) + \frac{n}{\log n}$

2. ✔ $T(n) = 2.T\left(\frac{n}{2}\right) + \log n$

3. ✖ $T(n) = 2.T\left(\frac{2n}{2}\right) + \log n$

4. ✖ All of these

Question Number : 49 Question Id : 8737181129 Display Question Number : Yes Is Question Mandatory : No

What is the running time of an efficient algorithm to determine if there exists an integer 'i' such that $i=A_i$ in an array A of n integers $A_0<A_1<\ldots<A_{n-1}$?

Options :

1. ✖ O(1)

2. ✔ O(logn)

3. ✖ O(n)

4. ✖ $O(n^2)$

Question Number : 50 Question Id : 8737181130 Display Question Number : Yes Is Question Mandatory : No

A list has n-strings where each string is of length n. Using divide and conquer approach, what is the worst case running time (tightest upper bound) to find the first string?

Options :

1. ✖ $O(n^2)$

2. ✖ O(n)

3. ✔ $O(n\log n)$

4. ✖ $O(n^2 \log n)$

Question Number : 51 Question Id : 8737181131 Display Question Number : Yes Is Question Mandatory : No

Suppose there are n linearly ordered distinct elements with n>100. What is the worst case running time to find i-th smallest element ($1 \leq i \leq n$) from these n elements.

Options :

1. ✖ $O(\log n)$

2. ✔ $O(n)$

3. ✖ $O(n\log n)$

4. ✖ $O(n^2)$

Question Number : 52 Question Id : 8737181132 Display Question Number : Yes Is Question Mandatory : No

What is the running time to merge the k-sorted arrays, each of length n, to get a single array whose elements are sorted ?

Options :

1. ✖ $O(k)$

2. ✖ $O(n)$

3. ✖ $O(nk)$

4. ✔ $O(nklogk)$

Question Number : 53 Question Id : 8737181133 Display Question Number : Yes Is Question Mandatory : No

What is the running time of matrix chain multiplication using the dynamic programming approach with n-matrices?

Options :

1. ✖ $O(n)$

2. ✖ $O(n^2)$

3. ✔ $O(n^3)$

4. ✖ $O(2^n)$

Question Number : 54 Question Id : 8737181134 Display Question Number : Yes Is Question Mandatory : No

Given an array A of n integer elements. What is the tightest upper bound to compute the number of inversion pairs?

Options :

1. ✖ $O(n)$

2. ✔ $O(nlogn)$

3. ✖ $O(n^2)$

4. ✖ $O(n^2 \log n)$

Question Number : 55 Question Id : 8737181135 Display Question Number : Yes Is Question Mandatory : No

Let $f(n)=\Omega(n)$, $g(n)=O(n)$ and $h(n)=\theta(n)$. then $[f(n).g(n)]+h(n)$ is _____

Options :

1. ✔ $\Omega(n)$

2. ✖ $O(n)$

3. ✖ $\theta(n)$

4. ✖ $o(n)$

Question Number : 56 Question Id : 8737181136 Display Question Number : Yes Is Question Mandatory : No

Which of the following problem may not give optimal solution by greedy strategy

Options :

1. ✔ 0/1 knapsack problem

2. ✖ Single source shortest path problem

3. ✖ Huffman coding

4. ✖ Fractional knapsack problem

Question Number : 57 Question Id : 8737181137 Display Question Number : Yes Is Question Mandatory : No

Given array of distinct integers A [1, 2,….,n]. Find the tightest upper bound to check the existence of any index for which A[i]=i.

Options :

1. ✖ O(1)

2. ✖ O(logn)

3. ✔ O(n)

4. ✖ O(nlogn)

Question Number : 58 Question Id : 8737181138 Display Question Number : Yes Is Question Mandatory : No

Assume an array A [1,…,n] has n-elements , and every element of an array is less than or equal to n . An element is said to be "majority element", if it is occurred in more than n/2 positions of an array. What is the time complexity to check whether the majority element exist or not in the given array?

Options :

1. ✖ O (log n)

2. ✔ O (n)

3. ✖ O (nlogn)

4. ✖ $O(n^2)$

Question Number : 59 Question Id : 8737181139 Display Question Number : Yes Is Question Mandatory : No

The number of comparisons required to find maximum and minimum in the given array of n elements using divide and conquer is _____.

Options :

1. ✖ $\left\lfloor \frac{3n}{2} \right\rfloor$

2. ✖ $\left\lceil \frac{3n}{2} \right\rceil$

3. ✖ $\left\lceil \frac{3n}{2} \right\rceil+2$

4. ✔ $\left\lceil \frac{3n}{2} \right\rceil-2$

Question Number : 60 Question Id : 8737181140 Display Question Number : Yes Is Question Mandatory : No

Let $T(n)=T(n-1)+2^n$ for $n>1$ and $T(1)=1$. Then T(n) is _____.

Options :

1. ✖ $O(n.2^n)$

2. ✖ $O(2^{2n})$

3. ✔ $O(2^{n})$

4. ✖ $O(2^{n} \log n)$

Question Number : 61 Question Id : 8737181141 Display Question Number : Yes Is Question Mandatory : No

Consider two grammars G1 : A→A1|0A1|01 ; G2 A→ 0A|1 , which of the following is True regarding above grammars?

Options :

1. ✖ L1 is LR(k)

2. ✔ L2 is LP(k)

3. ✖ Both L1 and L2 is LR(k)

4. ✖ None is LR(k)

Question Number : 62 Question Id : 8737181142 Display Question Number : Yes Is Question Mandatory : No

Consider the Transition Rule P→PαQ |Q ; Q→ QβR|R ; R→num If 2α3 α4β1α2β1 is evaluated to 18, then which of the following is the correct value for α and β ?

Options :

1. ✖ +,*

2. ✖ +,-

3. ✔ *,-

4. ✖ -,+

Question Number : 63 Question Id : 8737181143 Display Question Number : Yes Is Question Mandatory : No

There are six different blue boxes, eight different green boxes and five different red boxes. What is the number of ways to select an unordered pair of boxes having two different colours?

Options :

1. ✖ 120

2. ✖ 130

3. ✔ 118

4. ✖ 128

Question Number : 64 Question Id : 8737181144 Display Question Number : Yes Is Question Mandatory : No

Choose the correct statements.

Options :

1. ✖

Topological sort can be used to obtain an evaluation order of a dependency graph

2. ✔ Evaluation order for a dependency graph dictates the order in which the semantic rules are done

3. ✖ Code generation does not depends on the order in which the semantic actions are performed

4. ✖ Only (1) and (3) are correct

Question Number : 65 Question Id : 8737181145 Display Question Number : Yes Is Question Mandatory : No

For which of the following situations, inherited attribute is a natural choice?

Options :

1. ✖ Evaluation of arithmetic expression

2. ✖ Keep track of variable evaluation

3. ✔ Checking for the correct use of L- Values and R- Values

4. ✖ Tokenization

Question Number : 66 Question Id : 8737181146 Display Question Number : Yes Is Question Mandatory : No

If two finite state machines M and N are isomorphic the M can be transformed to N by relabeling

Options :

1. ✔ The states alone

2. ✖ The edges alone

3. ✖ Both the states and edges

4. ✖ Interchanging initial and final states.

Question Number : 67 Question Id : 8737181147 Display Question Number : Yes Is Question Mandatory : No

Which of the following symbol table implementation makes efficient use of memory?

Options :

1. ✔ List

2. ✖ Search tree

3. ✖ Hash tree

4. ✖ Self-organizing list

Question Number : 68 Question Id : 8737181148 Display Question Number : Yes Is Question Mandatory : No

Hamming distance is a _____

Options :

1. ✔ Theoretical way of measuring errors

2. ✖ Technique for assigning codes to a set of items known to occur with a given probability

3. ✖ Technique for optimizing the intermediate code

4. ✖ Option 1 and 3 are correct

Question Number : 69 Question Id : 8737181149 Display Question Number : Yes Is Question Mandatory : No

Consider the Grammar S→ aB | aAb ; A→bAb|a ; B→aB|∈. How many back tracks are required to generate the string aab from the above grammar?

Options :

1. ✖ 1

2. ✔ 2

3. ✖ 3

4. ✖ 4

Question Number : 70 Question Id : 8737181150 Display Question Number : Yes Is Question Mandatory : No

Consider the following Syntax Directed Tree. A→ BC *

(P) B.i=f(A.i)

(Q) B.i=f(A.S)

(R) A.S=f(B.s)

Among P,Q,R which one is violating L-attributed definition?

Options :

1. ✖ P only

2. ✔ Q only

3. ✖ P, Q only

4. ✖ P, Q, R only

Question Number : 71 Question Id : 8737181151 Display Question Number : Yes Is Question Mandatory : No

Which of the following grammer(s) is (are) in Chomsky Normal Form?

a. S→ ∈ | XY ; X→ 0 | YS ; Y→ 1 | XX

b. S→AB | AA | BB ; A→ 0 | BA ; B→ 1

c. S→ 0P | 1Q | PQ ; P→ 1 | QP ; Q→ 0 | PQ

Options :

1. ✖ a only

2. ✔ b only

3. ✖ Both a and b

4. ✖ Both b and c

Question Number : 72 Question Id : 8737181152 Display Question Number : Yes Is Question Mandatory : No

Which of the following is TRUE?

Options :

1. ✖ The equality problem (L1 = L2) of CFLs is decidable

2. ✖ The emptiness of CSL's is decidable

3. ✔ Finiteness of CFL is decidable

4. ✖ Is L1 ∩ L2 = Ø is decidable for CSL's

Question Number : 73 Question Id : 8737181153 Display Question Number : Yes Is Question Mandatory : No

Consider the following languages: L_{ne}={<M>| L(M)≠Ø} , L_e={<M>| L(M)= Ø} where <M> denotes encoding of a Turing machine M . Then which one of the following is true?

Options :

1. ✔ L_{ne} is Recursive enumerable but not recursive and L_e is not Recursive enumerable.

2. ✖ Both are not Recursive enumerable.

3. ✖ Both are recursive.

L_e is Recursive enumerable. But not recursive and L_{ne} is not Recursive enumerable.

4. ✖

Question Number : 74 Question Id : 8737181154 Display Question Number : Yes Is Question Mandatory : No

Consider PDA = M=($\{q_0,q_1\}$,$\{a,b\}$,$\{a,z_0\}$,δ,q_0,z_0,$\emptyset$) which accepts by the empty stack

δ: $(q_0,a,z_0) = (q_0,az_0)$
$(q_0,a,a)=(q_0,aa)$
$(q_0,b,a)=(q_1,a)$
$(q_1,b,a)=(q_1,a)$
$(q1,a,a)=(q_1,\in)$
$(q1,\in,Z_0)=(q_1,\in)$

Which one of the following strings is accepted by the above PDA?
S1 aaa
S2 aabbaa
S3 aba
S4 aaab

Options :

1. ✖ Only S2,S3 and S4

2. ✖ Only S1

3. ✔ Only S2 and S3

4. ✖ Only S2

Question Number : 75 Question Id : 8737181155 Display Question Number : Yes Is Question Mandatory : No

Which of the following is true for the given grammar?

A→ A+A

A→ A*A

A→ id

Options :

1. ✖ * has precedence over +

2. ✖ + has precedence over *

3. ✔ Both are of same precedence

4. ✖ Assignment statement is after + but before *

Question Number : 76 Question Id : 8737181156 Display Question Number : Yes Is Question Mandatory : No

Consider the following CFG, find the number of productions in the minimized grammar after it is converted it into Greibach normal form.
S→ AA |0 , A→ SS|1

Options :

1. ✔ 17

2. ✖ 15

3. ✖ 12

4. ✖ 18

Question Number : 77 Question Id : 8737181157 Display Question Number : Yes Is Question Mandatory : No

Which one of the following regular expression over {0, 1} denotes the set of strings which do not contain 101 as a substring?

Options :

1. ✖ 0*100+

2. ✖ 1*(01+0*)

3. ✖ 10*10

4. ✔ 0*(1+(00)+)*0*

Question Number : 78 Question Id : 8737181158 Display Question Number : Yes Is Question Mandatory : No

If string of length 10 is used to test for membership , then the number of table entries in CYK Algorithm is

Options :

1. ✖ 50

2. ✔ 55

3. ✖ 45

4. ✖ 99

Question Number : 79 Question Id : 8737181159 Display Question Number : Yes Is Question Mandatory : No

Consider the CFG (Context free grammar) , find the number of productions in the minimized grammar after it was converted into Chomsky Normal Form.
S→ s+a |s*s|a|b

Options :

1. ✔ 8

2. ✖ 6

3. ✖ 9

4. ✖ 4

Question Number : 80 Question Id : 8737181160 Display Question Number : Yes Is Question Mandatory : No

Consider three decision problems P1, P2 and P3. It is known that P1 is decidable and P2 is undecidable. Which one of the following is true?

Options :

1. ✖ P3 is decidable if P1 is reducible to P3

2. ✖ P3 is undecidable if P3 is reducible to P2

3. ✔ P3 is undecidable if P2 is reducible to P3

4. ✖ P3 is decidable if P3 is reducible to P2's complement

Question Number : 81 Question Id : 8737181161 Display Question Number : Yes Is Question Mandatory : No

Determine the number of page faults when references to pages occur in the order – 1, 2, 4, 5, 2, 1, 2, 4. Assume that the main memory can accommodate 3 pages and the main memory already has the pages 1 and 2. With page 1 having been brought earlier than page 2.(Assume LRU algorithm is used)

Options :

1. ✖ 3

2. ✖ 5

3. ✔ 4

4. ✖ 0

Question Number : 82 Question Id : 8737181162 Display Question Number : Yes Is Question Mandatory : No

If 'm' processes share 'n' resources of the same type, the maximum need of each process does not exceed 'n' and the sum of all their maximum needs is always less than 'm+n'. In this case:

Options :

1. ✔ Deadlock can never occur

2. ✖ Deadlock may occur

3. ✖ Deadlock has to occur

4. ✖ Options 1 and 2 are correct

Question Number : 83 Question Id : 8737181163 Display Question Number : Yes Is Question Mandatory : No

Which of the classical IPC problem is not solved using semaphores?

Options :

1. ✖ Producer Consumer

2. ✖ Dining Philosopher

3. ✖ Sleeping Barber

4. ✔ Byzantine Problem

Question Number : 84 Question Id : 8737181164 Display Question Number : Yes Is Question Mandatory : No

In Round Robin Scheduling algorithm , there are 'n' processes in ready queue and time slice is 'q' units in worst case , the interrupted process will get the CPU again after :

Options :

1. ✔ (n-1) q units

2. ✖ nq

3. ✖ (q-1) n

4. ✖ (q+1)n

Question Number : 85 Question Id : 8737181165 Display Question Number : Yes Is Question Mandatory : No

How many processes will be created if we run the following program?

```
main ( )
{
printf( “hi”) ;
fork();
printf(“Hello”);
fork();
fork();
}
```

Options :

1. ✖ 3

2. ✖ 6

3. ✔ 7

4. ✖ 8

Question Number : 86 Question Id : 8737181166 Display Question Number : Yes Is Question Mandatory : No

What are the drawbacks of Shortest Job First (SJF) Algorithm?

Options :

1. ✖ SJF has minimum Average TAT and Average Waiting time.

2. ✔ It is practically not possible to predict Burst time 100 percent accurately before even executing the process

3. ✖ SJF does not have any Convoy effect

4. ✖ Option 2 and 3 are correct

Question Number : 87 Question Id : 8737181167 Display Question Number : Yes Is Question Mandatory : No

Round Robin scheduling is more suitable when :

Options :

1. ✖ Minimum Context Switches are needed.

2. ✔ More interaction is needed by the tasks.

3. ✖ High priority processes needs to be completed first.

4. ✖ Option 1 and 2 correct.

Question Number : 88 Question Id : 8737181168 Display Question Number : Yes Is Question Mandatory : No

Disabling interrupts solution guarantees _____.

a) Mutual Exclusion

b) Bounded Waiting

c) Progress

d) Most feasible solution for real time

Which of the above statements are true?

Options :

1. ✔ A and C

2. ✖ A,B,C

3. ✖ B,D

4. ✖ A,B,C,D

Question Number : 89 Question Id : 8737181169 Display Question Number : Yes Is Question Mandatory : No

Strict Alteration uses turn variable to ensure Mutual Exclusion. Which of the following is False?

A) Algorithm fails to ensure Mutual Exclusion

B) Algorithm fails to guarantee progress

C) Turn is a shared variable but the values are not shared

D) Bounded waiting is not guaranteed

Options :

1. ✖ Only B

2. ✖ Only A,B and C

3. ✔ A and D

4. ✖ B,C

Question Number : 90 Question Id : 8737181170 Display Question Number : Yes Is Question Mandatory : No

Consider the following pseudo program:
Semaphore $M_x = 1$, $M_y=0$

```
void P()
{
  while (1)
    {
      P(Mx);
       print '0';
      V(My);
    }
}
void Q()
{
   while (1)
    {
      P(My); P(Mx);
       print '1' ;
      V(Mx);
    }
}
```

The possible output of the pseudo program :

Options :

1. ✖ Any number of zeros followed by any number of 1's

2. ✖ Any number of ones followed by any number of 0's

3. ✔ Zero followed by deadlock

4. ✖ One followed by deadlock

Question Number : 91 Question Id : 8737181171 Display Question Number : Yes Is Question Mandatory : No

After you ____ a record, in many data management systems, the environments require you to issue a command to save the changes you made.

Options :

1. ✖ Delete

2. ✔ Update

3. ✖ Sort key

4. ✖ Index

Question Number : 92 Question Id : 8737181172 Display Question Number : Yes Is Question Mandatory : No

Consider a relation R which is in 3NF, but not in BCNF. Which one of the following statements is TRUE on R?

Options :

1. ✖ A cell in R holds a set instead of an atomic value

2. ✖ R has a nontrivial functional dependency X→A, where X is not a super key and A is a non – prime attribute and X is a not proper subset of some key.

3. ✖ R has a nontrivial functional dependency X→A, Where X is not a super key and A is a non – prime attribute and X is a proper subset of some key

4. ✔ R has a nontrivial functional dependency X→A, Where X is not a super key and A is a prime attribute

Question Number : 93 Question Id : 8737181173 Display Question Number : Yes Is Question Mandatory : No

A relational database contains two tables Student and Performance as shown below:

Student Roll No.	Student Name
1	Arjun
2	Naveen
3	Deepika
4	Vineel
5	Lakshmi

Performance

Roll_No	Subject_Code	Marks
1	A	86
1	B	95
1	C	90
2	A	89
2	C	92
3	C	80

The primary key of the Student table is Roll_no. For the Performance table, the attributes Roll_no and Subject_code together from the primary key. The number of rows returned by the following SQL query

```
SELECT S.Student_name,sum(P.Marks)
FROM Student S, Performance P
WHERE P.Marks>84
GROUP BY S.Student_name;
```

Options :

1. ✖ 7

2. ✖ 9

3. ✖ 0

4. ✔ 5

Question Number : 94 Question Id : 8737181174 Display Question Number : Yes Is Question Mandatory : No

The following functional dependencies hold true for the relational schema {V,W,X,Y,Z}:

V→W

VW→X

Y→VX

Y→Z

Which of the following is irreducible equivalent for this set of functional dependencies?

Options :

1. ✔
V→W
V→X
Y→V
Y→Z

2. ✖
V→W
W→X
Y→V
Y→Z

3. ✖
V→W
V→X
Y→V
Y→X
Y→Z

4. ✖
V→W
W→X
Y→V
Y→X
Y→Z

Question Number : 95 Question Id : 8737181175 Display Question Number : Yes Is Question Mandatory : No

Consider a Relation R, R is defined as R(A# , STATUS , CITY,ANAME) where A# is the primary key . If R is decomposed into two relations R1 and R2 , then which of the following is a lossless decomposition?

Options :

1. ✔ R1(A#,STATUS) , R2(A#,CITY,ANAME)

2. ✖ R1(A#,STATUS), R2(STATUS,CITY,ANAME)

3. ✖ R1(A# ,STATUS,CITY) , R2(CITY,ANAME)

4. ✖ R1(A#,STATUS,ANAME), R2(CITY,STATUS)

Question Number : 96 Question Id : 8737181176 Display Question Number : Yes Is Question Mandatory : No

A company needs to develop a strategy for software product development for which it has a choice of two programming languages L1 and L2. The number of lines of code (LOC) developed using L2 is estimated to be twice the LOC developed with Ll. The product will have to be maintained for five years. Various parameters for the company are given in the table below.

Parameter	Language L1	Language L2
Man years needed for development	LOC/10000	LOC/10000
Development cost per man year	Rs. 10,00,000	Rs. 7,50,000
Maintenance time	5 years	5 years
Cost of maintenance per year	Rs. 1,00,000	Rs. 50,000

Total cost of the project includes cost of development and maintenance. What is the LOC for L1 for which the cost of the project using L1 is equal to the cost of the project using L2?

Options :

1. ✖ 4000

2. ✔ 5000

3. ✖ 4333

4. ✖ 4555

Question Number : 97 Question Id : 8737181177 Display Question Number : Yes Is Question Mandatory : No

Which one of the following is not desired in good software requirement specifications document?

Options :

1. ✖ Goals of implementation

2. ✔ Algorithm for software implementation

3. ✖ Non-functional Requirements

4. ✖ Functional requirements

Question Number : 98 Question Id : 8737181178 Display Question Number : Yes Is Question Mandatory : No

The coupling between different modules of a software is categorized as follows

I. Content Coupling
II. Common coupling
III. Control coupling
IV. Data coupling

Rank the coupling between modules in the order of strongest(least desirable) to weakest (most desirable)

Options :

1. ✖ IV-II-III-I

2. ✔ I-II-III-IV

3. ✖ II-III-I-IV

4. ✖ III-II-IV-I

Question Number : 99 Question Id : 8737181179 Display Question Number : Yes Is Question Mandatory : No

Consider the statements about the cyclomatic complexity of the control flow graph of a program module. Which of these are false?

A. The cyclomatic complexity of a module is equal to the maximum number of linearly independent circuits in the graph.
B. The cyclomatic complexity of a module is the number of decisions in the module plus one, where a decision is effectively any conditional statement in the module.
C. The cyclomatic complexity can't be used as a number of linearly independent paths that should be tested during path coverage testing.

Options :

1. ✖ A and B

2. ✔ A and C

3. ✖ B and C

4. ✖ Only A

Question Number : 100 Question Id : 8737181180 Display Question Number : Yes Is Question Mandatory : No

A company needs to develop digital signal processing software for one of its newest inventions. The software is expected to have 40000 lines of code. The company needs to determine the effort in person-months needed to develop this software using the basic COCOMO model. The multiplicative factor for this model is given as 2.8 for the software development on embedded systems, while the exponentiation factor is given as 1.20. What is the estimated effort in person-months?

Options :

1. ✔ 235.25

2. ✖ 532.52

3. ✖ 287.80

4. ✖ 782.08

Question Number : 101 Question Id : 8737181181 Display Question Number : Yes Is Question Mandatory : No

The subnet mask for a particular network is 255.255.31.0. Which of the following pairs of IP address could belong to this network?

Options :

1. ✖ 172.57.88.62 and 172.56.87.23

2. ✖ 10.35.28.2 and 10.35.29.4

3. ✖ 191.203.31.87 and 191.234.31.88

4. ✔ 128.8.129.43 and 128.8.161.55

Question Number : 102 Question Id : 8737181182 Display Question Number : Yes Is Question Mandatory : No

A sender is employing public key cryptography to send a secret message to a receiver. Which one of the following statements are TRUE?

Options :

1. ✔ Sender encrypts using receiver's public key

2. ✖ Sender encrypts using his own public key

3. ✖ Receiver decrypts using sender's public key

4. ✖ Receiver decrypts using his own public key

Question Number : 103 Question Id : 8737181183 Display Question Number : Yes Is Question Mandatory : No

Consider Two popular routing algorithms: Distance vector (DV) and Link State (LS) routing . Which of the following are true?

S1: Count to infinity is a problem only with DV and not with LS routing.

S2 : In LS , the shortest path is calculated at each and every router

S3: In DV, the shortest path algorithm runs only at one node

S4 : DV requires lesser number of network messages than LS

Options :

1. ✔ S1 , S2 and S4 only

2. ✖ S1 , S3 and S4 only

3. ✖ S2 and S3 only

4. ✖ S1 and S4 only

Question Number : 104 Question Id : 8737181184 Display Question Number : Yes Is Question Mandatory : No

A client process P needs to make a TCP connection to a server process S. Consider the following situation: the server process S executes a socket (), a bind () and a listen () system call in that order, following which it is pre-empted. Subsequently, the client process P executes a socket () system call followed by connect () system call to connect to the server process S. The server process has not executed any accept () system call. Which one of the following events could take place?

Options :

1. ✖ Connect() system call returns successfully

2. ✖ Connect() system call blocks

3. ✔ Connect() system call returns an error

4. ✖ Connect () system call returns in a core dump

Question Number : 105 Question Id : 8737181185 Display Question Number : Yes Is Question

Mandatory : No

Suppose a class B network on the internet has a subnet mask of 255.255.248.0.
What is the maximum number of hosts per subnet?

Options :

1. ✖ 1022

2. ✖ 1023

3. ✖ 2047

4. ✔ 2046

Question Number : 106 Question Id : 8737181186 Display Question Number : Yes Is Question Mandatory : No

What is the maximum size of data that the Transport layer can pass on to its lower layer in TCP/IP?

Options :

1. ✖ Any size

2. ✔ 65515 byte

3. ✖ 65535 byte

4. ✖ 1500 bytes

Question Number : 107 Question Id : 8737181187 Display Question Number : Yes Is Question Mandatory : No

Frames of 1000 bits are sent over a 10^6 bps duplex link between two hosts. The propagation time is 25ms. Frames are to be transmitted into this link to maximally pack them in transit. What is the minimum number of bits that will be required to represent the sequence number distinctly? Assume that no time gap needs to be given between transmissions of two frames.

Options :

1. ✖ 2

2. ✖ 3

3. ✖ 4

4. ✔ 5

Question Number : 108 Question Id : 8737181188 Display Question Number : Yes Is Question Mandatory : No

What is the maximum size of data that the Data link layer can pass on to its lower layer in TCP/IP?

Options :

1. ✖ Any size

2. ✖ 65515 byte

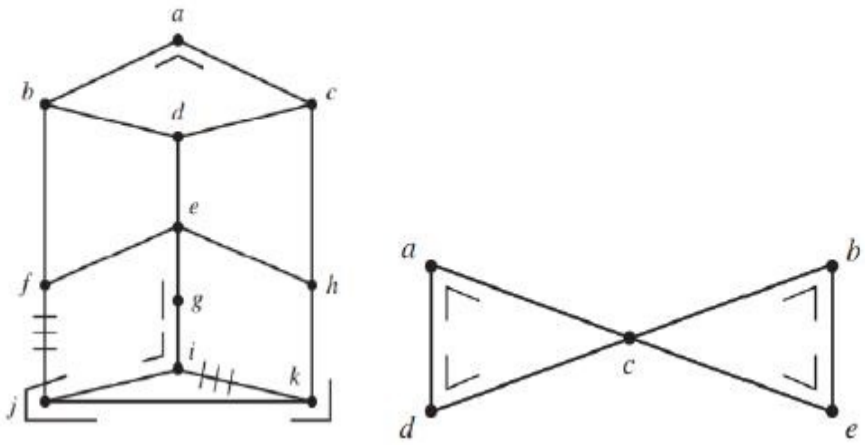
3. ✖ 65535 byte

4. ✔ 1500 bytes

Question Number : 109 Question Id : 8737181189 Display Question Number : Yes Is Question

Mandatory : No

Observe the following graphs. Infer which of the following statements is true?



Options :

1. ✔ Neither the left graph nor the right graph has a Hamiltonian circuit.

2. ✖ The left graph has a Hamiltonian circuit, but the right graph does not.

3. ✖ The left graph does not have a Hamiltonian circuit, but the right graph has a Hamiltonian circuit.

4. ✖ Both the graphs have a Hamiltonian circuit

Question Number : 110 Question Id : 8737181190 Display Question Number : Yes Is Question Mandatory : No

Assume that a request is made for a web page through a web browser to a web server. Initially the browser cache is empty. Further, the browser is configured to send HTTP requests in non-persistent mode. The web page contains text and five very small images. The minimum number of TCP connections required to display the web page completely in that browser is _____.

Options :

1. ✖ 5

2. ✖ 1

3. ✔ 6

4. ✖ 2

Question Number : 111 Question Id : 8737181191 Display Question Number : Yes Is Question Mandatory : No

The function $f(x)=kx^3$ in $0<x<1$ is a valid probability density function, if k=

Options :

1. ✖ 7

2. ✖ 6

3. ✔ 4

4. ✖ 9

Question Number : 112 Question Id : 8737181192 Display Question Number : Yes Is Question Mandatory : No

The probability of producing a defective bolt is 0.1. The probability that out of 5 bolts one will be defective is

Options :

1. ✖ $\frac{1}{3}(0.1)^4$

2. ✖ $\frac{1}{3}(0.9)^4$

3. ✖ $\frac{1}{2}(0.1)^4$

4. ✔ $\frac{1}{2}(0.9)^4$

Question Number : 113 Question Id : 8737181193 Display Question Number : Yes Is Question Mandatory : No

If $f: R \to R$ be given by $f(x)=(3-x^3)^{1/3}$, then fof(x) is

Options :

1. ✖ $x^{1/3}$

2. ✖ x^3

3. ✔ x

4. ✖ $3-x$

Question Number : 114 Question Id : 8737181194 Display Question Number : Yes Is Question Mandatory : No

A _____ value is represented by a Boolean expression.

Options :

1. ✖

Positive

2. ✖ Recursive

3. ✖ Negative

4. ✔ Boolean

Question Number : 115 Question Id : 8737181195 Display Question Number : Yes Is Question Mandatory : No

The determinant of an orthogonal matrix is

Options :

1. ✖ 0

2. ✖ >1

3. ✖ <1

4. ✔ ±1

Question Number : 116 Question Id : 8737181196 Display Question Number : Yes Is Question Mandatory : No

If two Eigen vectors of a symmetric matrix are $\begin{bmatrix} 1 \\ -1 \\ 1 \end{bmatrix}$ *and* $\begin{bmatrix} 1 \\ 0 \\ -1 \end{bmatrix}$ then the third

Eigen vector is

Options :

1. ✖ $\begin{bmatrix} 1 \\ -1 \\ 1 \end{bmatrix}$

2. ✖ $\begin{bmatrix} -1 \\ -2 \\ 2 \end{bmatrix}$

3. ✖ $\begin{bmatrix} -1 \\ 1 \\ 1 \end{bmatrix}$

4. ✔ $\begin{bmatrix} 1 \\ 2 \\ 1 \end{bmatrix}$

Question Number : 117 Question Id : 8737181197 Display Question Number : Yes Is Question Mandatory : No

The next iterative value of the root of $x^2 - 4=0$ using secant method, if the initial guesses are 3 and 4, is

Options :

1. ✔ 2.2857

2. ✖ 2.5000

3. ✖ 5.5000

4. ✖ 5.7143

Question Number : 118 Question Id : 8737181198 Display Question Number : Yes Is Question Mandatory : No

To evaluate $\int_2^{10} \frac{dx}{1+x}$ using Simpson's $\frac{1}{3}$ rule taking $h = 1.0$ the number of intervals are $---$

Options :

1. ✔ 8

2. ✖ 10

3. ✖ 5

4. ✖ 9

Question Number : 119 Question Id : 8737181199 Display Question Number : Yes Is Question Mandatory : No

The value of c in Cauchy MVT for f(x)= e^x and g(x)= e^{-x} in (3,7) is

Options :

1. ✖ 4

2. ✔ 5

3. ✖

4.5

4. ✖ 6

Question Number : 120 Question Id : 8737181200 Display Question Number : Yes Is Question Mandatory : No

The points on the plane $x + y + z = 9$ which are closest to origin is

Options :

1. ✔ (3,3,3)

2. ✖ (2,1,3)

3. ✖ (2,2,2)

4. ✖ (3,4,1)