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## Computer Science and Information technology

**Group Number :** 1  
**Group Id :** 39090043  
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## Mathematics

**Section Id :** 39090079  
**Section Number :** 1  
**Section type :** Online  
**Mandatory or Optional:** Mandatory  
**Number of Questions:** 10  
**Number of Questions to be attempted:** 10  
**Section Marks:** 10  
**Display Number Panel:** Yes  
**Group All Questions:** No

**Sub-Section Number:** 1  
**Sub-Section Id:** 39090079  
**Question Shuffling Allowed :** Yes

**Question Number : 1 Question Id : 3909005041 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**  
**Single Line Question Option : No Option Orientation : Vertical**  
**Correct Marks : 1 Wrong Marks : 0**

For the matrix  $A = \begin{bmatrix} 2 & -2 & 3 \\ -2 & -1 & 6 \\ 1 & 2 & 0 \end{bmatrix}$  one of the Eigen values is 3. The other two Eigen values are

Options :

1. 2, -5
2. 3, -5
3. 2, 5
4. 3, 5

Question Number : 2 Question Id : 3909005042 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

For what values of  $a, b$  the system of equations  $x + y + z = 3$ ,  $x + 2y + 2z = 6$ ,  $x + ay + 3z = b$  have no solution

Options :

1.  $a = 3, b \neq 9$
2.  $a \neq 3, b \in R$
3.  $a = 3, b = 9$
4.  $a = 3, b \in R$

Question Number : 3 Question Id : 3909005043 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The characteristic roots of  $\begin{bmatrix} 3 & 7 \\ 2 & 5 \end{bmatrix}$  are  $\lambda_1$  and  $\lambda_2$ , the characteristic roots of  $\begin{bmatrix} 5 & -7 \\ -2 & 3 \end{bmatrix}$  are

Options :

1.  $\lambda_1$  and  $\lambda_2$

2.  $2\lambda_1$  and  $\lambda_2$

3.  $\lambda_1$  and  $2\lambda_2$

4.  $\frac{1}{\lambda_1}$  and  $\frac{1}{\lambda_2}$

Question Number : 4 Question Id : 3909005044 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which one of the following propositional forms is tautology?

Options :

1.  $P \wedge \sim (q \wedge p)$

2.  $P \wedge \sim q$

3.  $P \Rightarrow (P \wedge q)$

4.  $P \Rightarrow (P \vee q)$

Question Number : 5 Question Id : 3909005045 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $P(A) = \frac{1}{5}$ ,  $P(B) = \frac{2}{3}$  and  $P(A \cap B) = \frac{1}{15}$ , then  $P(A \cap B^c) =$

Options :

1.  $\frac{2}{15}$

2.  $\frac{4}{15}$

3.  $\frac{14}{15}$

4.  $\frac{3}{5}$

Question Number : 6 Question Id : 3909005046 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $X_1$  and  $X_2$  are two independent random variables such that variance of  $X_1$  and  $X_2$  are  $a$  and  $b$  then  $Var(pX_1 + qX_2 + r)$  is equal to ...

Options :

1.  $p^2a^2 + q^2b^2 + r^2$

2.  $p^2a^2 + q^2b^2$

3.  $p^2a + q^2b$

4.  $pa + qb + r$

Question Number : 7 Question Id : 3909005047 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a Binomial distribution for mean 4 and variance 3 then its mode is

Options :

1. 3

2. 4

3. 5

4. 6

Question Number : 8 Question Id : 3909005048 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The variance of uniform probability distribution given by  $f(x) = \frac{1}{n}$  for  $x = 1, 2, 3, \dots, n$  is

Options :

1.  $\frac{n+1}{2}$

2.  $\frac{(n+1)(2n+1)}{6}$

3.  $\frac{n^2-1}{12}$

4.  $\frac{n^2+1}{12}$

Question Number : 9 Question Id : 3909005049 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The value of  $c$  of Cauchy's mean value theorem for the function  $f(x) = \frac{1}{x^2}$  and

$$g(x) = \frac{1}{x^2} \text{ in } [a, b]$$

Options :

1.  $\frac{2ab}{a+b}$

2.  $\frac{2ab}{a-b}$

3.  $\frac{2}{ab}$

4.  $\frac{2}{a-b}$

Question Number : 10 Question Id : 3909005050 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

If  $f(x) = xy + (x - y)$  the stationary points are

Options :

1.  $(0, 0)$

2.  $(0, -1)$

3.  $(1, 2)$

4.  $(1, -1)$

Computer Science and Information technology

Section Id :	39090080
Section Number :	2
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	110
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Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	39090080
Question Shuffling Allowed :	Yes

Question Number : 11 Question Id : 3909005051 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Which data structure is suitable to represent hierarchical relationship between elements?

Options :

1. Dequeue

2. Priority

3. Tree

4. Graph

Question Number : 12 Question Id : 3909005052 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider Language A defined over the alphabet  $\Sigma = \{0,1\}$  as  $A = \{0\lfloor n/2 \rfloor 1^n : n \geq 0\}$

The expression  $\lfloor n/2 \rfloor$  means the floor of  $n/2$ , or what you get by rounding  $n/2$  down to the nearest integer.

Which of the following is not an example of a string in A?

Options :

1. 011
2. 0111
3. 0011
4. 001111

Question Number : 13 Question Id : 3909005053 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Given the disk capacity of 50 MB has block size 256 bytes and block/cluster is 8, the number of entries require in the FAT (File Allocation Table) is?

Options :

1.  $50 * 2^{12}$
2.  $50 * 2^{10}$
3.  $50 * 2^{24}$
4.  $50 * 2^9$

Question Number : 14 Question Id : 3909005054 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An entity has:

- (i) a set of properties
- (ii) a set of properties and values for all the properties
- (iii) a set of properties and the values for some set of properties may non-uniquely identify an entity
- (iv) a set of properties and the values for some set of properties may uniquely identify an entity

Which of the above are valid?

Options :

- 1. (i) and (iii) only
- 2. (ii) and (iv) only
- 3. (ii) only
- 4. (iv) only

Question Number : 15 Question Id : 3909005055 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The following function REVERSE () reverses a singly linked list –

```
/* Link list node */
structnode
{
intdata;
structnode* next;
};

/* head_ref is a double pointer which points to head (or start) pointer
of linked list */
staticvoidreverse (structnode** head_ref)
{
structnode* prev = NULL;
structnode* current = *head_ref;
structnode* next;
while(current != NULL)
{
next = current->next;
/*ADD A STATEMENT HERE*/
prev = current;
current = next;
}
*head_ref = prev;
}
```

There's a missing line in the code. What should be added in place of /\*ADD A STATEMENT HERE\*/, so function gives the correct output.

Options :

1. current->next = prev;
2. next->next = prev;
3. prev->next = prev;
4. current = prev

Question Number : 16 Question Id : 3909005056 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider the following code:  $x=(y+5) + (*z)*10-x/3$

Which of the following correctly identified by lexical analysis after scanning the above code?

Options :

1. 3 Identifiers and 4 literal
2. 3 Identifiers and 3 literals
3. 4 Identifiers and 3 literals
4. 6 literals

Question Number : 17 Question Id : 3909005057 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For binary search in an array of n elements the average number of searches is

Options :

1.  $\log_2(n)$
2.  $\text{ceil}(\log_2(n))$
3.  $\text{floor}(\log_2(n))$
4.  $n \log n$

Question Number : 18 Question Id : 3909005058 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The E-R model is expressed in terms of:

- I. Entities
- II. The relationship among entities.
- III. The attributes of the entities.
- IV. Functional relationship.

Options :

1. I, II
2. I, II, IV
3. II, IV

4. I, II, III

Question Number : 19 Question Id : 3909005059 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

If start point to first node of the following linked list 6->5->4->3->2->1, what will be the output of the function below?

```
voidfun (structnode* start)
{
  if (start == NULL)
  return;
  printf ("%d", start->data);

  if(start->next! = NULL)
  fun(start->next->next);
  printf ("%d", start->data);
}
```

Options :

1. 631136
2. 642642
3. 6542
4. 642246

Question Number : 20 Question Id : 3909005060 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Match the following:

- |              |                        |
|--------------|------------------------|
| a. Create    | i. The E-R model       |
| b. Select    | ii. Relationship Model |
| c. Rectangle | iii. DDL               |
| d. Record    | iv. DML                |

Options :

1. a-iii, b-iv, c-i, d-ii

2. a-iv, b-iii, c-ii, d-i
3. a-iv, b-iii, c-i, d-ii
4. a-iii, b-iv, c-ii, d-i

Question Number : 21 Question Id : 3909005061 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider a sorted array of  $n$  numbers. What would be the time complexity of the best known algorithm to find a pair 'a and b' such that  $|a-b| = k$ , and  $k$  being a positive integer.

Options :

1.  $O(\log n)$
2.  $O(n)$
3.  $O(n \log n)$
4.  $O(n^2)$

Question Number : 22 Question Id : 3909005062 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which one of the following statements is FALSE with respect to sequence and collaboration diagrams?

Options :

1. Sequence diagram depicts time ordering of messages
2. Collaboration diagram depicts structural organization
3. Collaboration diagram doesn't explicitly specify life line of an object
4. Sequence diagram specifies link between two objects

Question Number : 23 Question Id : 3909005063 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider the following two languages

$$L1 = \{1^N 0^N 1^N 0^N \mid N \geq 1\}$$

$$L2 = \{a^N b^k \mid N \leq k \leq 2N\}$$

Which of the following statements is true?

Options :

1. both L1 and L2 are context free
2. L1 is context free but not L2
3. L2 is context free but not L1
4. neither L1 nor L2 is context free

Question Number : 24 Question Id : 3909005064 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Which is a valid process state transition?

Options :

1. Timer Start: ready->running
2. Timer Out: running->blocked
3. I/O: running->ready
4. Resume : suspend->running

Question Number : 25 Question Id : 3909005065 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Suppose we have the following sorted list: [3, 5, 6, 8, 11, 12, 14, 15, 17, 18] and array data structure is used. We are using recursive binary search algorithm to search an element 8. Which of the following group of numbers correctly show the sequence of comparison used to find element 8?

(Assume array index starting with 0).

Options :

1. 11,5,6,8
2. 12,6,11,8
3. 11,6,5,8
4. 12,11,6,8

Question Number : 26 Question Id : 3909005066 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The recurrence relation capturing the optimal time of merge sort algorithm with  $n$  elements is

Options :

1.  $T(n) = 2 T(n/2) + 1, \quad T(2) = 2$
2.  $T(n) = 2 T(n/2) + n, \quad T(2) = 2$
3.  $T(n) = T(n/2) + 1, \quad T(2) = 2$
4.  $T(n) = 2T(n-1) + n, \quad T(2) = 2$

Question Number : 27 Question Id : 3909005067 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is a checked dynamic semantic error in C?

Options :

1. Use of uninitialized variable
2. Access off the end of an array
3. Wrong number of parameters passed to a function
4. Divide by zero

Question Number : 28 Question Id : 3909005068 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The result evaluating the postfix expression  $10\ 5 + 60\ 6 / * 8 -$  is

Options :

1. 1420
2. 1065
3. 710
4. 355

Question Number : 29 Question Id : 3909005069 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Suppose that cache access time is 7 ns, main memory access time is 50 ns and disk space access time is 1200 ns. If the hit rate of cache is 60% and of main memory hierarchy is 70 percent, the average memory access time is \_\_\_\_\_ (in ns).

Options :

1. 170
2. 171
3. 172
4. 173

Question Number : 30 Question Id : 3909005070 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A Priority-Queue initially has 5 elements and is implemented as a Max Heap. The level-order traversal of the heap is: 11, 9, 6, 4, 3. Two new elements 2 and 8 are inserted in the heap in that order. The level-order traversal of the heap after the insertion of the elements is:

Options :

1. 11, 9, 8, 6, 4, 3, 2
2. 11, 9, 8, 3, 4, 2, 6

3. 11, 9, 8, 2, 3, 4, 6

4. 11, 9, 8, 4, 3, 2, 6

Question Number : 31 Question Id : 3909005071 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Depth First Search is equivalent to which of the following traversal in Binary trees.

Options :

1. Pre-order traversal

2. Post-order traversal

3. In-order traversal

4. Level order traversal

Question Number : 32 Question Id : 3909005072 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

What is the expected number of items that hash to a particular location for 16 keys and 12 slots in a hashing table with uniform hashing and chaining

Options :

1. 4.66

2. 1.50

3. 2.66

4. 4

Question Number : 33 Question Id : 3909005073 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Consider a hash table of size seven with starting index zero and a hash function  $(3x+4) \bmod 7$ . Assuming that the hash table is initially empty, which of the following is the contents of the table when the sequence 1,3,8,10 is inserted into the table using closed hashing. Note that “-” represents an empty location in the table.

Options :

1. 8, \_, \_, \_, \_, \_, 10

2. 1, 8, 10, \_, \_, \_, 3

3. 1, \_, \_, \_, \_, \_, 3

4. 1, 10, 8, \_, \_, \_, 3

Question Number : 34 Question Id : 3909005074 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Let  $\langle M \rangle$  be the encoding of a Turing machine as a string over

$\Sigma = \{0,1\}$  Let  $L = \{\langle M \rangle \mid M \text{ is a Turing machine that accepts a string of length } 2014\}$ .

Then  $L$  is

Options :

1. Recursively enumerable

2. Not Recursively enumerable

3. Recursive

4. Undecidable

Question Number : 35 Question Id : 3909005075 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the number of binary search trees that can be formed with 10 nodes having elements 1, 2, 3, ..., 10 such that the root of tree is 6 and the root of left subtree is 4?

Options :

1. 70

2. 37

3. 16

4. 40

Question Number : 36 Question Id : 3909005076 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
 Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$L = \{ a^m b^n c^k d^l \mid (n-k) \text{ is odd only if } (m-l) \text{ is odd, } m, n, k, l \geq 0 \}$  is best fit under which language class

Options :

1. RL
2. DCFL
3. CFL
4. CSL

Question Number : 37 Question Id : 3909005077 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
 Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is FALSE?

Options :

1. LL(k) grammars are context free grammar
2. LL(k) grammars are unambiguous
3. There are LL(k) grammars which are not context free
4. LL(k) grammars cannot have left recursion

Question Number : 38 Question Id : 3909005078 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
 Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the given options best represents the relation between the following equations?

$$f(n) = 3n^{\sqrt{n}}$$

$$g(n) = 2^{\sqrt{n} \log_2 n}$$

$$h(n) = n!$$

Options :

1.  $h(n)$  is  $O(f(n))$
2.  $h(n)$  is  $O(g(n))$
3.  $g(n)$  is not  $O(f(n))$
4.  $f(n)$  is  $O(g(n))$

Question Number : 39 Question Id : 3909005079 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If we consider a stack based implementation of LRU, then the topmost page on the stack represents:

Options :

1. the most frequently accessed page
2. the most recently used page
3. the least frequently accessed page
4. the least recently used page

Question Number : 40 Question Id : 3909005080 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In compiler optimization, operator strength reduction uses mathematical identities to replace slow math operations with faster operations. Which of the following code replacements is an illustration of operator strength reduction?

Options :

1. Replace  $P + P$  by  $2 * P$  or Replace  $3 + 4$  by 7.
2. Replace  $P * 32$  by  $P \ll 5$
3. Replace  $P * 0$  by 0
4. Replace  $(P \ll 4) - P$  by  $P * 15$

Question Number : 41 Question Id : 3909005081 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

To implement a queue of size  $n$ , what is the minimum number of stacks of size  $n$  required?

Options :

1. one
2. two
3. three
4. four

Question Number : 42 Question Id : 3909005082 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Debugger is a program that:

Options :

1. allows to examine and modify the contents of registers
2. does not allow execution of a segment of program
3. allows to set breakpoints, execute a segment of program and display contents of register
4. allows to modify the program counter

Question Number : 43 Question Id : 3909005083 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the maximum number of reduce moves that can be taken by a bottom-up parser for a grammar with no epsilon- and unit-production (i.e., of type  $A \rightarrow \epsilon$  and  $A \rightarrow a$ ) to parse a string with  $n$  tokens?

Options :

1.  $n/2$
2.  $n-1$
3.  $2n-1$

4.  $2^n$

Question Number : 44 Question Id : 3909005084 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Consider the following declaration of a two-dimensional array in C

char a [50][50];

Assuming that the main memory is byte-addressable and that the array is stored starting from memory address 0, the address of a [20][25] is:

Options :

1. 2025
2. 2525
3. 2020
4. 2050

Question Number : 45 Question Id : 3909005085 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Consider the following two sets of LR(1) items of an LR(1) grammar.

$X \rightarrow c.X, c/d$

$X \rightarrow .cX, c/d$

$X \rightarrow .d, c/d$

$X \rightarrow c.X, \$$

$X \rightarrow .cX, \$$

$X \rightarrow .d, \$$

Which of the following statements related to merging of the two sets in the corresponding LALR parser is/are FALSE?

- I. Cannot be merged since look aheads are different.
- II. Can be merged but will result in S-R conflict.
- III. Can be merged but will result in R-R conflict.
- IV. Cannot be merged since goto on c will lead to two different sets.

Options :

1. I only
2. II only
3. I and IV
4. I, II, III, and IV

Question Number : 46 Question Id : 3909005086 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following query transformations (i.e., replacing the l.h.s. expression by the r.h.s expression) is incorrect? R1 and R2 are relations, C1 and C2 are selection conditions and A1 and A2 are attributes of R1.

Options :

1.  $\sigma_{C1}(\sigma_{C2}(R1)) \rightarrow \sigma_{C2}(\sigma_{C1}(R1))$
2.  $\sigma_{C1}(\pi_{A1}(R1)) \rightarrow \pi_{A1}(\sigma_{C1}(R1))$
3.  $\sigma_{C1}(R1 \cup R2) \rightarrow \sigma_{C1}(R1) \cup \sigma_{C1}(R2)$
4.  $\pi_{A1}(\sigma_{C1}(R1)) \rightarrow \sigma_{C1}(\pi_{A1}(R1))$

Question Number : 47 Question Id : 3909005087 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following operations can be performed in  $O(\log n)$  time or faster on a sorted array A? (n denotes the size of array)

- A. Search(A, x)
- B. Find-Minimum(A)
- C. Delete(A, x)

Choose the correct option:

Options :

1. A & C

2. A & B
3. B & C
4. A, B & C

Question Number : 48 Question Id : 3909005088 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

In a two-pass assembler, symbol table is

Options :

1. Generated in first pass
2. Generated in second pass
3. Not generated at all
4. Generated and used only in second pass

Question Number : 49 Question Id : 3909005089 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

How many perfect matchings are there in a complete graph of 4 vertices?

Options :

1. 4
2. 3
3. 6
4. 12

Question Number : 50 Question Id : 3909005090 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Consider 3 processes A, B and C to be scheduled as per SRTF scheduling. The process A is known to be scheduled first and when A has been running for 5 units of time the process C has arrived. The process C has run for 1 unit of time, then the process B has arrived and completed running for 3 units of time. Then what could be the minimum burst time of processes A and C?

Options :

1. 11, 5
2. 12, 3
3. 11, 4
4. 12, 4

Question Number : 51 Question Id : 3909005091 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The length of string of minimum length in  $\{0,1\}^*$  not in the language corresponding to the given RE  $(0^*+1^*)^*$

Options :

1. is zero
2. is one
3. is more than one
4. can't be determined

Question Number : 52 Question Id : 3909005092 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the below input gives best case time for selection sort?

Options :

1. 0, 1, 2, 3, 4, 5, 6, 7, 8, 9
2. 9, 8, 7, 6, 5, 4, 3, 2, 1, 0
3. 3, 4, 6, 2, 0, 1, 8, 7, 9, 5

4. All of the given options take same time

Question Number : 53 Question Id : 3909005093 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Incremental-Compiler is a compiler

Options :

1. which is written in a language that is different from the source language
2. compiles the whole source code to generate object code afresh
3. compiles only those portion of source code that have been modified.
4. that runs on one machine but produces object code for another machine

Question Number : 54 Question Id : 3909005094 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The address resolution protocol (ARP) is used for:

Options :

1. Finding the IP address from the DNS
2. Finding the IP address of the default gateway
3. Finding the IP address that corresponds to a MAC address
4. Finding the MAC address that corresponds to an IP address

Question Number : 55 Question Id : 3909005095 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Function F finds maximum and minimum of 50 numbers. Number of comparisons in this function are:

Options :

1. 72
2. 147

3. 1225

4. 50

Question Number : 56 Question Id : 3909005096 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider the following C function:

```
int A(int a)
{
static int i = 1;
if (a >= 7)
return a;
a = a+i;
i++;
return A(a);
}
```

The value returned by A(1) is

Options :

1. 7

2. 8

3. 9

4. 10

Question Number : 57 Question Id : 3909005097 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Examine the structure of the EMPLOYEES table:

EMPLOYEE\_ID NUMBER Primary Key

FIRST\_NAME VARCHAR2(25)

LAST\_NAME VARCHAR2(25)

Assume all the following four options are executed in the same sequence order.  
Which statement will not insert a row into the table?

Options :

1. INSERT INTO employees(first\_name,last\_name, employee\_id) VALUES (1000, 'John','Smith');
2. INSERT INTO employees VALUES ('1000','John',NULL);
3. INSERT INTO employees (employee\_id) VALUES (1000);
4. INSERT INTO employees (employee\_id, first\_name, last\_name) VALUES ( 1000, 'John','');

Question Number : 58 Question Id : 3909005098 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following pairs of traversals help in identifying a labelled binary tree uniquely?

- (i) preorder and postorder
- (ii) inorder and postorder
- (iii) preorder and inorder
- (iv) level order and postorder

Options :

1. (i) only
2. (ii) and (iii)
3. (iii) only

4. (iv) only

Question Number : 59 Question Id : 3909005099 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider the following statements related to compiler construction:

I. Lexical Analysis is specified by context-free grammars and implemented by pushdown automata.

II. Syntax Analysis is specified by regular expressions and implemented by finite-state machine.

Which of the above statement(s) is/are correct?

Options :

1. Only I
2. Only II
3. Both I and II
4. Neither I nor II

Question Number : 60 Question Id : 3909005100 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider an interpolation search which is an improvement over binary search where the values in a sorted array are uniformly distributed. In interpolation search, construction of new data points take place at different locations according to the value of the key being searched. Find the time complexity of interpolation search.

Options :

1.  $O(\log n)$
2.  $O(n)$
3.  $O(n \log n)$
4.  $O(\log(\log n))$

Question Number : 61 Question Id : 3909005101 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Evaluate the given postfix expression using Stack.

$16\ 4\ 2\ \wedge / 4\ 6\ * + 10\ 2\ * -$

Top two elements of stack when first  $*$  is evaluated are:

Options :

1. 4, 1
2. 24, 1
3. 20, 25
4. 6, 4

Question Number : 62 Question Id : 3909005102 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Given Boolean function  $Z$ ,  $Z = AB'C$ , what are the minimum number of NAND gates required to derive this expression.

Options :

1. Two
2. Three
3. Five
4. Four

Question Number : 63 Question Id : 3909005103 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An OS contains 10 identical processes that were initiated at the same time. Each process contains 15 identical requests, and each request consumes 20msec of CPU time. A request is followed by an I/O operation that consumes 10 msec. The system consumes 2 msec in CPU scheduling. For time quantum of 20 msec, the response times of the first request of the last process is

Options :

1. 26 msec
2. 220 msec
3. 200 msec
4. 20 msec

Question Number : 64 Question Id : 3909005104 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following logic gates or combination of them can be used to implement all the possible combinational logic functions?

- a) NAND gates only
- b) EX-OR gates only
- c) NOR gates only
- d) OR gates only

Options :

1. a only
2. a and c
3. c only
4. a and b

Question Number : 65 Question Id : 3909005105 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The problem described by the language  $L = \{\langle M1, M2 \rangle \mid L(M1) = L(M2)\}$  is

Options :

1. decidable
2. semi decidable
3. not even semi-decidable

4. recursively enumerable

Question Number : 66 Question Id : 3909005106 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Let R (ABCD) and S(DEF). D is the foreign key in R that references primary key in S. Which of the following will not be a violation?

- a. Insertion in R
- b. Insertion in S
- c. Deletion from R
- d. Deletion from S

Options :

1. a
2. b
3. b and c
4. b, c, and d

Question Number : 67 Question Id : 3909005107 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the given Logic gate give output when all the inputs are reset to 0?

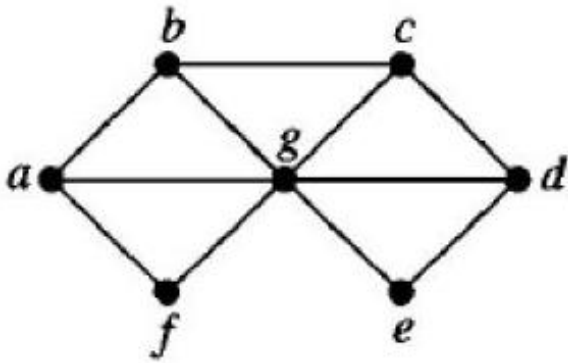
Options :

1. NAND or EX-OR Gate
2. NOT or EX-NOR Gate
3. OR or EX-NOR Gate
4. AND or EX-OR Gate

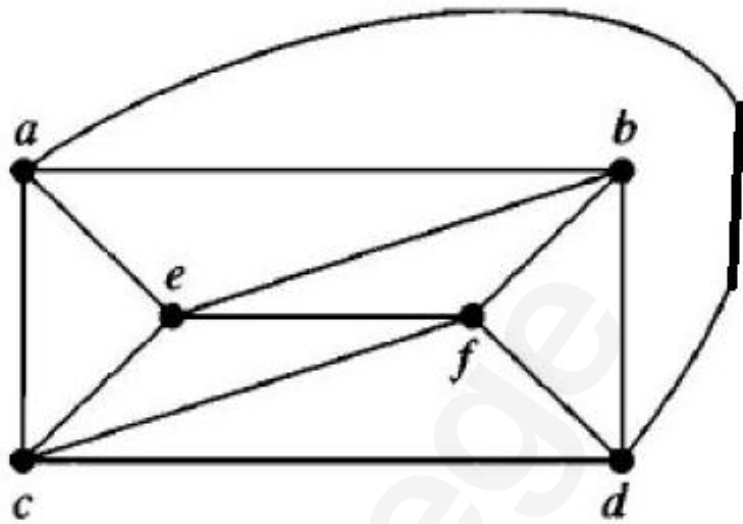
Question Number : 68 Question Id : 3909005108 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What are the chromatic numbers of following graphs?



(a)



(b)

Options :

1. 6, 8
2. 3, 3
3. 3, 8
4. 6, 3

Question Number : 69 Question Id : 3909005109 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Given are some expressions which represent X-NOR of x and y. Which of the following is incorrect?

Options :

1.  $xy + x'y'$
2.  $x \oplus y'$
3.  $x' \oplus y$
4.  $x' \oplus y'$

Question Number : 70 Question Id : 3909005110 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider the basic block given below.

$$b = b + c$$

$$d = b + d$$

$$b = b - d$$

$$e = d + b$$

The minimum number of nodes and edges present in the DAG representation of the above basic block respectively are

Options :

1. 6 and 6
2. 8 and 10
3. 9 and 12
4. 4 and 4

Question Number : 71 Question Id : 3909005111 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following programming techniques and structures are good for demand -  
paged environment?

- a) Stack
- b) Hashed symbol table
- c) Sequential search

Options :

1. Only a)
2. Only b)
3. Both a) and b)
4. Both a) and c)

Question Number : 72 Question Id : 3909005112 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
 Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Given a Boolean function -  $f(P, Q, R) = PQ + QR' + PR'$ , what is its min-term expansion?

Options :

1.  $m_0 + m_1 + m_3 + m_5$

2.  $m_2 + m_4 + m_6 + m_7$

3.  $m_0 + m_1 + m_6 + m_7$

4.  $m_2 + m_3 + m_4 + m_5$

Question Number : 73 Question Id : 3909005113 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
 Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which are the correct arguments?

(I) if A is a subset of B, and B is decidable, than A is guaranteed to be decidable.

(II) If L is Turing-decidable and L' is regular. Then  $L \cap L'$  is regular.

(III) The language  $L = \{ \langle D \rangle \mid D \text{ is a DFA and there exists a TM } M \text{ such that } L(M) = L(D) \}$  is Turing-decidable

(IV) If  $L_1$  reduces to  $L_2$  and  $L_2$  is undecidable, then  $L_1$  is undecidable.

Options :

1. I, II, III

2. III, IV

3. III only

4. II, III only

Question Number : 74 Question Id : 3909005114 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
 Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Given Boolean Expression F,  $F = (A + B')(C' + D)(B' + C)$ . F' (Complement of F) is

Options :

1.  $AB + BC + CD$
2.  $AB' + CD' + BC$
3.  $AB' + C'D + B'C$
4.  $A'B + CD' + BC'$

Question Number : 75 Question Id : 3909005115 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ constraints ensure that a value that appears in one relation for a given set of attributes also appears for a certain set of attributes in another relation.

Options :

1. Logical Integrity
2. Referential Integrity
3. Domain Integrity
4. Data Integrity

Question Number : 76 Question Id : 3909005116 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Bit pattern 1 10000011 101000000000000000000000 represents floating point number in IEEE 754 single precision format. What is its value in decimal form?

Options :

1. -10
2. -13
3. -26
4. -39

Question Number : 77 Question Id : 3909005117 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If a process is executing in its critical section, then no other processes can be executing in the critical section. This condition is called

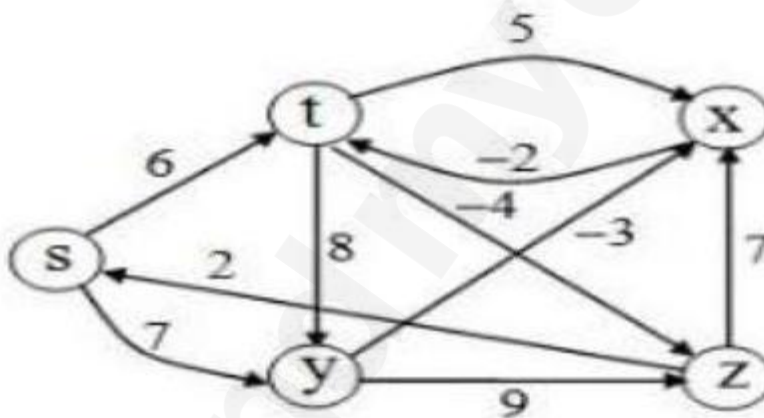
Options :

1. Mutual exclusion
2. Critical exclusion
3. Synchronous exclusion
4. Asynchronous exclusion

Question Number : 78 Question Id : 3909005118 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If we run Dijkstra algorithm on vertex (s) to the following graph, then which of the following is shortest path distance from (s) to (t)



Options :

1. 6
2. 2
3. 21
4. 4

Question Number : 79 Question Id : 3909005119 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider the immediate code below:

1. a=10
2. b=15
3. a=a+b
4. b=a-b
5. a=a-b
6. if (a==b) goto 3

The number of nodes and edges in Control Flow Graph of above code are x and y respectively. Value of x+ y is

Options :

1. 7
2. 8
3. 9
4. 10

Question Number : 80 Question Id : 3909005120 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Given that inputs J and K are both high in a positive edge triggered J-K flip flop. What will be the output on the rising edge of the clock?

Options :

1. no change
2. toggle
3. set
4. Reset

Question Number : 81 Question Id : 3909005121 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which one of the following regular expression describe the language over  $\{a,b\}$  consist of no pair of consecutive a's?

Options :

1.  $(b^*abb^*)(a+\epsilon)$
2.  $(b+ab)^*(a+\epsilon)$
3.  $(b^*abb^*)^*(a+\epsilon)+b^*$
4.  $(b^*ab^*)^*(a+\epsilon)+b^*(a+\epsilon)$

Question Number : 82 Question Id : 3909005122 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Given  $R = ABCDE$  and FD set

$\{ Ab \rightarrow CD, E \rightarrow A, D \rightarrow E \}$

If we decompose into BCNF .How many tables will we get?

Options :

1. 2
2. 3
3. 4
4. 5

Question Number : 83 Question Id : 3909005123 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In an absolute loading scheme which loader function is accomplished by assembler?

Options :

1. re-allocation
2. allocation
3. linking

4. loading

Question Number : 84 Question Id : 3909005124 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

When Manchester encoding used in Ethernet, bit rate is –

Options :

1. half the baud rate
2. twice the baud rate
3. same as the baud rate
4. four times the baud rate

Question Number : 85 Question Id : 3909005125 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider the language defined by the regular expression  $(a | b)^* b^+$ .

Which of the following regular expressions also define that language?

- (i)  $(a^*b^+)$  |  $(b^*b^+)$
- (ii)  $(ab | bb)^*b^*$
- (iii)  $(a | b | ba)^*b^+$

Options :

1. (i) only
2. (i) & (ii) only
3. (iii) only
4. (i), (ii) and (iii)

Question Number : 86 Question Id : 3909005126 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider a relation employee with the attributes empid, speciality and managerid.

The following rules hold for the above relation.

- i) each employee has many specializations
- ii) each manager has only one speciality
- iii) each speciality has many managers
- iv) employee has only one manager for each speciality.

Find normal form of relation employee

Options :

1. 1NF
2. 2NF
3. 3NF
4. BCNF

Question Number : 87 Question Id : 3909005127 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For a given undirected weighted graph  $G$  with  $V$  number of vertices, if you want to find all pair shortest paths then which one of the following is true ?

Options :

1. run Bellman Ford algorithm only once.
2. run Dijkstra's shortest path algorithm  $V$  times.
3. run Bellman Ford algorithm  $v^2$  times
4. run Dijkstra's shortest path algorithm  $\log V$  times

Question Number : 88 Question Id : 3909005128 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider the following statements:

S1 : Static allocation cannot support recursive function.

S2 : Stack allocation can support pointers but cannot deallocate storage at run-time.

S3 : Heap allocation can support pointers and it can allocate or deallocate storage at run-time.

Which of the above statements are true?

Options :

1. S1 and S2
2. S2 and S3
3. S3 and S1
4. S1, S2, and S3

Question Number : 89 Question Id : 3909005129 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Decimal and Hexadecimal representations of Octal number 326.4 are equivalent to

Options :

1.  $(214)_{10}$  and  $(D6.8)_{16}$
2.  $(212.5)_{10}$  and  $(D6.8)_{16}$
3.  $(214.5)_{10}$  and  $(D6.8)_{16}$
4.  $(214.5)_{10}$  and  $(D6.4)_{16}$

Question Number : 90 Question Id : 3909005130 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What will be the maximum cable length (in km) while transmitting data at a rate of 1000 Mbps in an ethernet LAN with frame size 20,000 bits. Assuming signal speed in cable to be 4,00,000 km/s.

Options :

1. 2
2. 5
3. 4
4. 10

Question Number : 91 Question Id : 3909005131 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Which delay metric is in distance vector routing?

Options :

1. number of hops
2. queue length
3. number of neighbours
4. geographical distance

Question Number : 92 Question Id : 3909005132 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The number of test cases required for boundary value analysis to test a program with 5 variables are

Options :

1. 30
2. 31
3. 15
4. 16

Question Number : 93 Question Id : 3909005133 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

There are 10 stations in a slotted LAN. Each station attempts to transmit with a probability 0.5 in each time slot. What is the probability that ONLY one station transmits in a given time slot?

Options :

1.  $(0.5)^9$
2.  $5(0.5)^9$
3.  $0.5(0.5)^9$
4.  $1-(0.5)^9$

Question Number : 94 Question Id : 3909005134 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In 2's complement arithmetic, which logic gate can be used to detect overflow?

Options :

1. XOR
2. OR
3. AND
4. NAND

Question Number : 95 Question Id : 3909005135 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Identify the language generated by the following grammar:

$S \rightarrow AB$

$A \rightarrow aAb | \epsilon$

$B \rightarrow bB | b$

Options :

1.  $\{a^m b^n | n \geq m, m > 0\}$
2.  $\{a^m b^n | n \geq m, m \geq 0\}$

3.  $\{a^m b^n | n > m, m > 0\}$

4.  $\{a^m b^n | n > m, m \geq 0\}$

Question Number : 96 Question Id : 3909005136 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is true for B tree and B+ tree index?

Options :

1. B tree index faster for range queries compare to B+ tree index.

2. If disk block allocated for B+ tree index and same size disk block allocated for B tree index then number of index blocks and I/O cost of B+ tree index less than or equal to B tree index for given distinct keys.

3. If disk block allocated for B+ tree index and same size disk block allocated for B tree index. Then B tree index access cost less than or equal to B+ tree index for given distinct keys.

4. If number of keys that can store in B tree and B+ tree index is same then I/O cost of B+ tree index less than equal to I/O cost of B tree index for random access of same key from set of distinct keys.

Question Number : 97 Question Id : 3909005137 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

One of the following phases can be optional in Agile oriented rapid development process is

Options :

1. Requirements engineering

2. Requirements specification

3. Design and Implementation

4. Testing

Consider the following code fragment

```
void foo(int x, int y)
```

```
{
```

```
  x+=y;
```

```
  y+=x;
```

```
}
```

```
main()
```

```
{
```

```
  int x=5.5;
```

```
  foo(x,x);
```

```
}
```

What is the final value of x in both call by value and call by reference, respectively?

Options :

1. 5 and 16
2. 5 and 12
3. 5 and 20
4. 12 and 20

4-bit addition of two numbers (1111, 0110) results in

Options :

1. 0101 and an overflow
2. 1101 and no overflow

3. 0101 and no overflow

4. 1101 and an overflow

Question Number : 100 Question Id : 3909005140 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following are stateless application layer protocols?

- a. HTTP
- b. FTP
- c. TCP
- d. POP3

Options :

- 1. a. and c.
- 2. b. and d.
- 3. b. and c.
- 4. d.

Question Number : 101 Question Id : 3909005141 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider a paging scheme, in which average process size is 32 MB and each page table entry size is 4B. The optimal size of page to minimize the total overhead due to page table and internal fragmentation is

Options :

- 1. 20 Kb
- 2. 14 Kb
- 3. 16 Kb
- 4. 12 Kb

Question Number : 102 Question Id : 3909005142 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
 Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Single source shortest path problems can be implemented by greedy algorithms using

Options :

1. Singly linked list
2. Min heap
3. AVL tree
4. Singly linked list, Min heap and AVL tree

Question Number : 103 Question Id : 3909005143 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
 Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the output Y of give logic gate combinational circuit.



Options :

1.  $X'$
2.  $X$
3. 0
4. 1

Question Number : 104 Question Id : 3909005144 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
 Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Assume that sender S and receiver R are connected through three intermediate routers labelled T. How many times each packet will visit the network layer and the data link layer during a transmission from S to R.

Options :

1. Network layer = 5 times, Data link layer = 5 times

2. Network layer = 5 times, Data link layer = 8 times
3. Network layer = 5 times, Data link layer = 4 times
4. Network layer = 2 times, Data link layer = 8 times

Question Number : 105 Question Id : 3909005145 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The hit ratio of a Transaction Look Aside Buffer (TLAB) is 70%. It takes 30 nanoseconds (ns) to search TLAB and 100 ns to access main memory. The effective memory access time is

Options :

1. 36 ns
2. 160 ns
3. 140 ns
4. 40 ns

Question Number : 106 Question Id : 3909005146 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider the following database schema:

- Frequents (kid, store)
- Sells (store, candy)
- Likes (kid, candy)

Table Frequents indicates what candy stores a kid likes to visit. Table Sells shows which candy each store sells. Table Likes tells which candy a kid likes.

Consider the following query:

1. (select kid from likes) EXCEPT
2. (select kid from likes where candy NOT in (select candy from sells where store = 'Starbucks'));

The query prints

Options :

1. the kids whose liked candies are not all sold by the 'Starbucks'.
2. the kids whose liked candies are only sold by the 'Starbucks'.
3. the kids whose liked candies are all sold by the store 'Starbucks'.
4. the kids whose liked candies are sold by stores other than 'Starbucks'

Question Number : 107 Question Id : 3909005147 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider a 'reversed Kruskal' Algorithm for computing a MST. Initialize T to be the set of all edges in the graph. Now consider edges from largest to smallest cost. For each edge, delete it from T if that edge belongs to a cycle in T. Assuming all the edge costs are distinct, does this new algorithm correctly compute a MST?

Options :

1. Yes
2. No

3. Cannot say

4. Gives shortest path

Question Number : 108 Question Id : 3909005148 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Consider the following transition rules:

A  $\rightarrow$  BC

C  $\rightarrow$  +BC|A| $\epsilon$

B  $\rightarrow$  DB {print '+'}| $\epsilon$

D  $\rightarrow$  (A)|id {print num.value}

On input '5+67' this translation scheme prints

Options :

1. 5+67+

2. 5+6+7+

3. 5+6+7

4. 5+67++

Question Number : 109 Question Id : 3909005149 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Value of radix r in  $\sqrt{256}_r = 13_r$ .

Options :

1. 3

2. 1

3. 8

4. 10

Question Number : 110 Question Id : 3909005150 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A token ring network has transmission and propagation speed as  $10^7$  bps and 200 metres/micro second respectively. Then 1-bit delay in network is:

Options :

1. 500 metres of cable.
2. 200 metres of cable.
3. 20 metres of cable.
4. 50 metres of cable.

Question Number : 111 Question Id : 3909005151 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Fill in both the blanks in correct order

\_\_\_\_\_ scheduler holds the degree of multi programming and  
\_\_\_\_\_ scheduler reduces the degree of multi-programming.

Options :

1. mid-term scheduler, long term scheduler
2. long term scheduler, mid-term scheduler
3. long term scheduler, short term scheduler
4. mid-term scheduler, short term scheduler

Question Number : 112 Question Id : 3909005152 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is a synchronization tool?

Options :

1. Thread
2. Pipe

3. Semaphore

4. Socket

Question Number : 113 Question Id : 3909005153 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Select the correct one from the below given options.

Options :

1. The parser's output is abstract syntax tree, which represents the grammatical structure of the parse input.

2. Parse tree is condensed form of Abstract Syntax tree.

3. In abstract syntax tree the operators can appear as leaves while keywords cannot appear as leaves.

4. All the three options are correct

Question Number : 114 Question Id : 3909005154 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

After the occurrence of a clock pulse, output of SR flip flop at time  $(t+1)$  remains the same as the output at time  $t$ . What is the logic value given at S and R?

Options :

1.  $S=0, R=1$

2.  $S=1, R=0$

3.  $S=1, R=1$

4.  $S=0, R=0$

Question Number : 115 Question Id : 3909005155 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Data is transmitted in Selective Repeat protocol using  $n$ -bit frame sequence number. What is the maximum window size for data transmission?

Options :

1.  $2^n$
2.  $2^n-1$
3.  $2^{n-2}$
4.  $2^{n-1}$

Question Number : 116 Question Id : 3909005156 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The bandwidth of the line is 1.5 Mbps with round trip time (RTT) as 45 ms. If size of each packet is 1 KB, then what is the efficiency in Stop and Wait protocol?

Options :

1. 20.3%
2. 10.0%
3. 10.8%
4. 11.0%

Question Number : 117 Question Id : 3909005157 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following devices uses logical as well as physical addressing?

Options :

1. Hub
2. Switch
3. Bridge
4. Router

Question Number : 118 Question Id : 3909005158 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

To implement OR gate, what are the minimum number of NAND gates needed?

Options :

1. 3
2. 2
3. 4
4. 5

Question Number : 119 Question Id : 3909005159 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Let  $f(X, Y) = X' + Y$ . Simplified expression for function  $f(f(a + b, b)c)$  is

Options :

1.  $a' + c$
2.  $abc$
3.  $ab' + c$
4.  $ab + c$

Question Number : 120 Question Id : 3909005160 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If a Boolean function  $F = XY + Z$  is to be implemented using only 2 input NOR gates, how many such gates are required in this case?

Options :

1. 2
2. 3
3. 4
4. 5