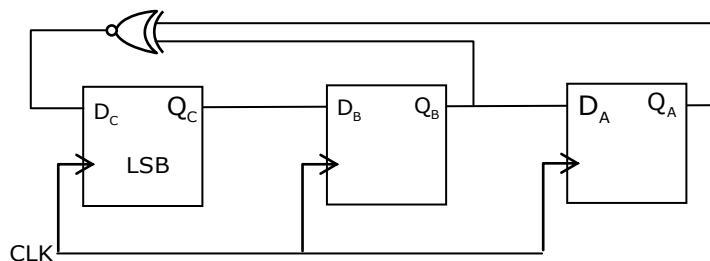


**Q. No. 1 – 25 Carry One Mark Each**

1. Which of the following regular expression generates the set of all strings not containing "baa" as a substring over input alphabet {a,b}?

(A)  $a^*(b^*a)^*$  (B)  $a^*b^*ab$  (C)  $a^*baba^*$  (D)  $a^*(ba+b)^*$

2. Consider the following synchronous sequential circuit:



Assuming all the flip flops to be cleared initially, what will be the state of the sequential counter after applying 173 clock pulses?

(A) 6 (B) 5 (C) 4 (D) 2

3. Choose the correct option:

**Assertion [A]:** The cycle allocation between the user process and DMA process depends only on the DMA channel activity.

**Reason [R]:** DMA provides capability of combining multiple interrupts into one, also lack of software overhead from loop-controlled instructions.

- (A) Both [A] and [R] are correct, and [R] is the correct reason for [A]  
(B) Both [A] and [R] are correct, and [R] is not the correct reason for [A]  
(C) Both [A] and [R] are incorrect statements  
(D) [A] is incorrect but [R] is correct statement

4. A byte addressable computer can support maximum of  $2^i$  KB memory and has  $2^j$  instructions. An instruction involving 2 operands and 1 operator needs how many bits?

(A)  $3i$  (B)  $2i + j$  (C)  $2i + j + 20$  (D)  $i + j$

5. For the recurrence relation  $a_n = 6a_{n-1} - 9a_{n-2} + F n$ , what will be the particular solution, if

Case 1 :  $F n = 3^n \cdot 5n + 1$

Case 2 :  $F n = 2^n \cdot 5n + 1$

- (A) Case 1 :  $a_n^p = 3^n \cdot An + B$ , Case 2 :  $a_n^p = 2^n \cdot An + B$   
(B) Case 1 :  $a_n^p = 3^n \cdot An + B$ , Case 2 :  $a_n^p = 2^n \cdot n \cdot An + B$   
(C) Case 1 :  $a_n^p = 3^n \cdot n^2 \cdot An + B$ , Case 2 :  $a_n^p = 2^n \cdot n^2 \cdot An + B$   
(D) Case 1 :  $a_n^p = 3^n \cdot n^2 \cdot An + B$ , Case 2 :  $a_n^p = 2^n \cdot An + B$

6. In typical RISC ISA, delayed branch executes which instruction irrespective of whether the branch condition is true or false?
- (A) Instruction immediately following the branch condition  
 (B) Instruction immediately preceding the branch condition  
 (C) Instruction that belongs to a different sub-routine  
 (D) It waits till the branch condition is evaluated

7. If  $\frac{dy}{dx} = x + y$ ,  $y(0) = 1$  and  $h = 0.1$  the value of  $K_2$  in 4<sup>th</sup> order Runge-Kutta method is
- (A) 0                              (B) 0.1                              (C) 0.11                              (D) 0.001

8. What is the output of the following program if **dynamic scoping** is used?

```
int a, b, c;
```

```
void func1()
```

```
{
    int a, b;
    a = 6;
    b = 8;
    func2();
    a = a+b+c;
    print(a);
}
```

```
void func2()
```

```
{
    int b, c;
    b = 4;
    c = a+b;
    a += 11;
    print(c);
}
```

```
void main()
```

```
{
    a = 3; b = 5; c = 7;
    func1();
}
```

- (A) 7 19                              (B) 10 1                              (C) 10 23                              (D) 10 32
9. Map the following statements to true(T)/false(F) respectively.
- S1: All XML elements must be lower case  
 S2: All XML elements must have a closing tag  
 S3: All XML documents must have a DTD
- (A) FTF                              (B) TTF                              (C) FFT                              (D) FTT

10. Which of the following is not correct regarding Prototype model?
- (A) Prototype is used to identify the requirements
  - (B) When detailed input or output efficiency of algorithm is not known prototype model is used
  - (C) Long term maintainability is achieved almost every time
  - (D) It focuses on those aspects which will be visible to end user
11. What is the output of the following code snippet?
- ```
int Add(int x, int y) {  
    return x+y;  
}  
  
int main() {  
    printf("%d", Add(7,3) + Add(1,2));  
}
```
- (A) Compilation error
  - (B) Compiler dependent
  - (C) 13
  - (D) None of these
12. Consider the statements:
- I. 2-SAT is in P
  - II. 3-SAT is in P
  - III. 2-coloring problem is in P
  - IV. 3-coloring problem is in P
- Map the above statements to true/ false.
- (A) I-true II-false III-false IV-false
  - (B) I-false II-false III-true IV-false
  - (C) I-true II-false III-true IV-false
  - (D) I-false II-false III-false IV-false
13. With indirect communication among processes the messages are sent to and received from mail boxes. In this scheme, consider the following statements about communication link and map them to true(T)/false(F) respectively.
- 1. A link can be associated with more than two processes
  - 2. A pair of communicating processes cannot have more than one link
- (A) TF
  - (B) FT
  - (C) FF
  - (D) TT
14. A program on workstation A attempts to open a TCP connection to port 1FFD H on a machine B, and a UDP connection to port 5EFA H on machine C. Which of the two machines generate an ICMP port unreachable error if both the applications on the corresponding ports on B and C are down?
- (A) Only B
  - (B) Only C
  - (C) Both B and C
  - (D) Neither B nor C

15. For the given input symbol  $\epsilon$ , the output produced by the Moore machine is 'A' and the output produced by the Mealy machine is 'B', then which of the following is true?  
 (A) A = the output associated with initial state, B =  $\epsilon$   
 (B) A =  $\epsilon$ , B = the output associated with initial state  
 (C) A = the output associated with input symbol, B =  $\epsilon$   
 (D) A =  $\epsilon$ , B = the output associated with input symbol
16. What is the output of the following program?
- ```
int fun(int n)
{
    if (n & n-1)
        return 1;
    return 0;
}

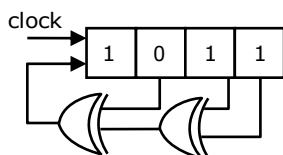
int main()
{
    int *p, i;
    p = fun;
    printf("%d", p[1025]);
    return 0;
}
```
- (A) 1 (B) 0  
 (C) Compiler dependent (D) Compilation error
17. If  $f_1(x)$  is  $O(g_1(x))$  and  $f_2(x)$  is  $O(g_2(x))$  then  $f_1(x) + f_2(x)$  is  
 (A)  $O(g_1(x) + g_2(x))$  (B)  $O(\min(g_1(x), g_2(x)))$   
 (C)  $O(\max(g_1(x), g_2(x)))$  (D)  $O(g_1(x) \times g_2(x))$
18. In the given relation R(ABCD) with FD's {  $A \rightarrow D$ ,  $B \rightarrow C$ ,  $C \rightarrow B$ ,  $D \rightarrow A$  } the number of candidate keys is \_\_\_\_\_

19. Consider the following processes, with their CPU Burst time given in milliseconds

Process	Burst time
P <sub>1</sub>	4
P <sub>2</sub>	3
P <sub>3</sub>	2
P <sub>4</sub>	1

Assume that all the processes are arrived into the ready queue at time 0, in the above order. Using round robin scheduling with a time slice of 2 milliseconds, the average waiting time for the above process in milliseconds is \_\_\_\_\_

20. The circuit shown below is a 4-bit SIPO register loaded with 1011.



If clock pulses are applied continuously, then the number of clock pulses required to give the same data 1011 again is \_\_\_\_\_

21. If  $2.3_4 + 1.2_4 = y_4$  then the value of  $y$  is \_\_\_\_\_
22. A system uses the Go – Back – N protocol with a window size of 8. Each packet carries 1024 bits of data, the distance between the sender and receiver is 1000km and the propagation speed is  $2 \times 10^8$  m/sec. By ignoring transmission, waiting, processing delays and also assuming that no data or control frame is lost or damaged, the time taken to send 1M bits of data in seconds is \_\_\_\_\_
23. Which of the following statements are TRUE?
1. All unambiguous grammars are regular.
  2. Every LL(K) and LR(K) grammar is unambiguous.
  3. A regular language can never be inherently ambiguous.
  4. A grammar is ambiguous if it contains a string for which both LMD and RMD can be written.
- (A) 1 and 4 only (B) 2 and 3 only  
(C) 1 and 2 only (D) 3 and 4 only
24. Which of the following field of activation record of a procedure points to the activation record of the calling procedure?

(A) Control Link (B) Access Link (C) Temporaries (D) Return Value

25. By using which of the following techniques, an optimizing compiler can optimize itself?
- (A) Cross Compiler (B) Translator  
(C) Boot Strapping (D) Assembler

**Q. No. 26 – 55 Carry Two Marks Each**

26. The system of equations  $2x + 4y = 7$ ,  $X + 2y = 0$  has
- (A) Unique solution (B) No solution  
(C) Exactly two solutions (D) Infinite no. of solutions
27. Consider the following statements about the 'Locality of Reference' principle used in the computer memory systems.
- I. The principal states that an already accessed memory location is accessed further again and it is also more likely that adjacent memory locations will also be accessed.
- II. The principle states that memory can be accessed simultaneously and in parallel on the basis of data content rather than by specific address or location.
- III. This principle help to reduce the average access time, and increase memory hits.
- Which of the above statements is/are TRUE?
- (A) I only (B) II only  
(C) II and III only (D) I and III only
28. To multiply two 32bit integers what should be the minimum size of the multiplicand and multiplier register assuming only product register is available apart from these two?
- (A) 32bit, 32bit (B) 64bit, 32bit  
(C) 64bit, 64bit (D) 32bit, 64bit
29. Consider the group  $0, 1, 2, 3, 4, +_5$ . What will be the value of  $2^{-3}$  and  $3^{-2}$  for the given group?
- (A) 1 and 1 (B) 2 and 3 (C) 4 and 4 (D) 3 and 2

30. Consider the following table structures:

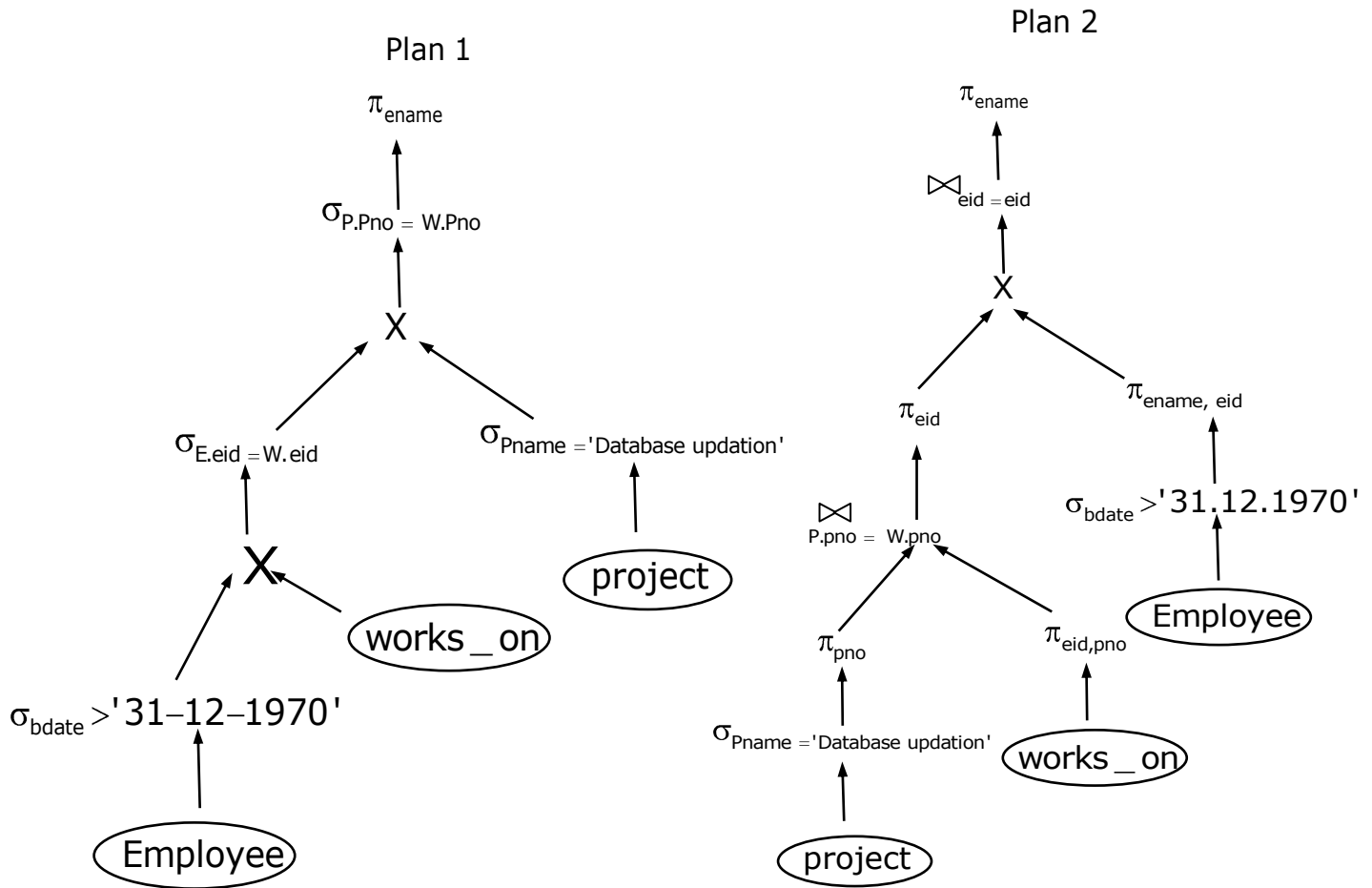
```
CREATE TABLE dept( dno number PRIMARY KEY, dname varchar2(30));
```

```
CREATE TABLE emp( eno number PRIMARY KEY, ename varchar2(30), dno number  
references dept(dno) ON DELETE CASCADE ON UPDATE CASCADE);
```

Which of the following statements is FALSE for the above table structures?

- (A) Insert into DEPT is always successful
- (B) Update on DEPT is always successful
- (C) Delete on DEPT is always successful
- (D) Update on EMP is always successful

31. Consider the following relation schemas Employee E, Project P and Works\_on W:  
 E (eid, ename, bdate, sex, edeptno., salary)  
 P (pno, pname, ploc, pdept no.)  
 W (eid, pno, hours)  
 To execute a query that retrieves names of employees born after 1970 and who work on a project named 'Database updation'.  
 We have following plans to execute the query.



Which of the following is true?

- (A) Both plan 1 and plan 2 execute with same performance in terms of query optimization
- (B) Plan 1 executes faster than plan 2
- (C) The performance and execution speed of plan 1 and plan 2 can only be compared when database is present with entries, as performance differ on different databases
- (D) Plan 2 is much more optimized than plan 1 for every possible database, hence executes faster



32. Consider any general function  $f: A \rightarrow B$ , where cardinality of set A is 'm' and that of set B is 'n'  $n \geq m$ .
- Find the total number of possible functions and number of many to one functions respectively.
- (A)  $m^n, m^n - {}^mP_n$  (B)  $n^m, n^m - {}^nP_m$
- (C)  $m^n, {}^mP_n$  (D)  $n^m, n^m \left\{ {}^nP_m = \frac{n!}{n-m!} \right\}$
33. The probability that a Contractor will get an infrastructure contract is 0.2. The probability that the contractor will get a welfare contract is 0.4. The probability that he will get both contracts is 0.1. What is the probability that the contractor will get either one of the contract is
- (A) 0.5 (B) 0.3 (C) 0.8 (D) None
34. A graph is said to be 2-colourable if each vertex can be coloured either red or blue and no two vertices of the same colour are connected by an edge. If some graph is not 2-colorable, then we can reduce it to become 2-colorable by deleting some edges. We are given any simple graph with 101 nodes.  $k$  is the least required number of edges we have to delete in order to make this graph 2-colorable (Eg:  $k=0$  for a graph which is already 2-colorable).
- The minimum value for 'k' to reach the worst case is \_\_\_\_\_
35. Assume that we are rolling 10 dice, then the probability of getting at least three 5's is \_\_\_\_\_
36. Which of the following functions is performed by loader?
- Physically places the machine instructions and data into memory
  - Allocates space in memory for the programs and resolves symbolic references between objects decks
  - Adjusts all address dependent locations, such as address constants, to correspond to the allocated space
  - All of these
37. Match the following lists.
- | List I                | List II               |
|-----------------------|-----------------------|
| A. Activation Record  | 1. Linking Loader     |
| B. Location Counter   | 2. Garbage Collection |
| C. Reference Counts   | 3. Sub-routine Call   |
| D. Address Relocation | 4. Assembler          |
- (A) A-3 B-4 C-1 D-2
- (B) A-4 B-3 C-1 D-2
- (C) A-4 B-3 C-2 D-1
- (D) A-3 B-4 C-2 D-1

38. Let there be two grammars  $G_1$  &  $G_2$ .  $G_1$  is left factored and free from left recursion,  $G_2$  is not left factored and also not free from left recursion. Choose the correct option about the two grammars.
- (A)  $G_1$  is an ambiguous grammar but  $G_2$  is unambiguous.  
 (B)  $G_1$  is an unambiguous grammar but  $G_2$  is ambiguous.  
 (C)  $G_1$  is an ambiguous grammar but  $G_2$  may or may not be ambiguous.  
 (D)  $G_1$  and  $G_2$  may or may not be ambiguous grammars.
39. Which of the following statements are false ?
- (I) Given two arbitrary context free grammars  $G_1$ ,  $G_2$  and it is undecidable whether  $L(G_1) = L(G_2)$   
 (II) Given two regular grammars  $G_1$ ,  $G_2$  and it is undecidable whether  $L(G_1) = L(G_2)$   
 (III) All recursive enumerable languages would be recursive, if halting problem is decidable.  
 (IV) For any CFG, it is undecidable whether or not a particular non-terminal 'X' in G is reachable.
- (A) (I) & (III) only (B) (II) & (IV) only  
 (C) (II) & (III) only (D) (II), (III) & (IV) only
40. Consider the following four statements given below, about Regular languages.
- S1: Regular Expressions  $00^* \epsilon + 0 = 0^*$   
 S2: Regular Expressions  $1^* 0 11^* = 1^* + 0 11^*$   
 S3: Some regular languages can't be generated by any CFG.  
 S4: A subset of a regular language is regular.  
 Thus for each of the above statements, indicated whether  
 It is  $\alpha \rightarrow \text{True}$   $\beta \rightarrow \text{False}$  ( $r \rightarrow$  may be true for some, but not all cases)
- (A) S1 –  $\alpha$ , S2 –  $\beta$ , S3 –  $\alpha$ , S4 –  $r$   
 (B) S1 –  $\alpha$ , S2 –  $\alpha$ , S3 –  $r$ , S4 –  $r$   
 (C) S1 –  $\beta$ , S2 –  $\beta$ , S3 –  $\beta$ , S4 –  $\beta$   
 (D) S1 –  $\alpha$ , S2 –  $\alpha$ , S3 –  $\beta$ , S4 –  $r$

41. Output of the following program will be
- ```
int main
{
    int i, a[8]= 000, 001, 010, 011, 100, 101, 110, 111 ;
    for i = 0; i < 8; i ++
        printf "%d", a[i] ;
    return 0;
}
```
- (A) 0, 1,2,3,4,5,6,7 (B) 0,1,10, 11, 100, 101, 110, 110  
(C) 0,1,8,9,100,101,110,111 (D) None of these
42. Consider the following letters along with their probability of occurrence  
v: 45%, w: 25%, x: 20%, y: 5%, z: 5%  
What is the original message for the following Huffman's Code? (Take smaller node as the left child with 0 code)  
011011111000110001010  
(A) vzxwvvyvww (B) vzxxvvyvww  
(C) vzwxxvyvww (D) Not a valid code
43. Which of the following pre-order traversals represents a valid binary search tree?  
(A) 1 3 2 4 5 7 8 6  
(B) 4 3 2 1 5 7 8 6  
(C) 4 2 1 3 7 8 6 5  
(D) 3 2 1 5 4 7 6 8
44. Find the output after applying 2 passes of radix sort followed by 1 pass of bubble sort to the given integers: 120, 231, 417, 343, 542, 998, 675, 196. Tie is broken as per FIFO order.  
(A) 120, 231, 542, 343, 675, 196, 417, 998  
(B) 417, 120, 231, 343, 542, 675, 196, 998  
(C) 417, 120, 231, 542, 343, 675, 196, 998  
(D) 120, 231, 417, 343, 542, 196, 675, 998

45. Assuming only numbers and letters given in the input, what does the following program do?

```
#include <stdio.h>
int main()
{
    int i,j, ascii[128];
    char ip[30];
    printf("Enter Input string: ");
    scanf("%s",ip);
    for(i=0;i<128;i++)
    {
        ascii[i]=0;
    }
    i=0;
    while(ip[i]!='\0')
    {
        j=(int)ip[i];
        ascii[j]++;
        if(ascii[j]>1)
        {
            printf("%c",ip[i]);
            return 0;
        }
        i++;
    }
    return 0;
}
```

- (A) Prints the position of first repeated character in the string  
 (B) Prints the first repeated character in the string  
 (C) Prints the position of last repeated character in the string  
 (D) Prints the last repeated character in the string
46. Consider a TCP machine having window size 32KB over a 512 Mbps channel that has one way delay of 20msec. The line efficiency in percentage is \_\_\_\_\_

47. Consider the schedule

$$S = \{R_1(A), R_2(B), W_2(A), W_1(A)\}$$

Assume that transaction  $T_1$  has started execution before the Transaction  $T_2$  then the schedule is

- (A) Allowed under Basic timestamp protocol but not under Thomas write rule
- (B) Not allowed under Basic timestamp protocol but allowed under Thomas write rule
- (C) Allowed under both Basic timestamp protocol and Thomas write rule
- (D) Not allowed under both Basic timestamp protocol and Thomas write rule

**Common Data Questions: 48 & 49**

Assume that we have ternary tree which means each node can have at most 3 children, namely left, middle and right. Consider the following function to calculate total number of nodes with exactly 3 children.

```
int find3Child Node *T
{
    int i; if T==NULL return 0;
    i=T → left &&T → middle &&T → right ?1:0
    return _____;
}
```

48. What should be in blank?

- (A) i
- (B)  $i + \text{find3Child } T \rightarrow \text{left} ;$
- (C)  $i + \text{find3Child } T \rightarrow \text{left} + \text{find3Child } T \rightarrow \text{middle} ;$
- (D)  $i + \text{find3Child } T \rightarrow \text{left} + \text{find3Child } T \rightarrow \text{middle} + \text{find3Child } T \rightarrow \text{right} ;$

Assume that we have ternary tree which means each node can have at most 3 children, namely left, middle and right. Consider the following function to calculate total number of nodes with exactly 3 children.

```
int find3Child Node *T
{
    int i; if T==NULL return 0;
    i=T → left &&T → middle &&T → right ?1:0
    return _____;
}
```

49. What is running cost of above algorithm? Assume total number of nodes in tree is n.

- (A)  $O(n^2)$
- (B)  $O(n^3)$
- (C)  $O(n \log n)$
- (D)  $O(n)$

**Common Data Questions: 50 & 51**

An organization is granted the block 150.36.0.0/16. The administrator wants to create 512 subnets.

50. What is the subnet mask?

- (A) 255.255.255.128/25 (B) 255.255.255.192/26  
(C) 255.255.255.224/27 (D) 255.255.255.240/28

An organization is granted the block 150.36.0.0/16. The administrator wants to create 512 subnets.

51. Find number of addresses in each subnet. Find the first and last addresses in first subnet.

- (A) 128, 150.36.0.1 and 150.36.0.127  
(B) 128, 150.36.0.129 and 150.36.0.255  
(C) 126, 150.36.0.1 and 150.36.0.126  
(D) 126, 150.36.0.129 and 150.36.0.254

**Statement for Linked Answer Questions: 52 & 53**

Suppose there are  $m$  instructions to be executed in a program. Also 'P' is the probability that instructions are conditional branch instruction, 'q' is the probability of successful branch. Assuming average number of instructions completed in a simple pipelined processor is 1. Also branch instructions takes 'n' clock cycles per instruction.

52. What should be the average CPI for the given program?

- (A) 1 (B)  $mpq n - 1 + P 1 - q mn$   
(C)  $1 + pq n - 1$  (D) None of these

Suppose there are  $m$  instructions to be executed in a program. Also 'P' is the probability that instructions are conditional branch instruction, 'q' is the probability of successful branch. Assuming average number of instructions completed in a simple pipelined processor is 1. Also branch instructions takes 'n' clock cycles per instruction.

53. If in the previous question, the branches (all) evaluate out to be unsuccessful, then by what factor is the average CPI reduced with respect to previous result?

- (A) No change (B) by factor of  $mp 1 - q$   
(C) by factor of  $1 - pq + npq$  (D) by factor of  $(npq)$

**Statement for Linked Answer Questions 54 & 55**

Consider a process that has been allocated 3 page frames. Assume that system uses pure demand paging. While undergoing execution, the process makes the following sequence of page references

1, 4, 5, 1, 6, 3, 1, 3, 2, 4, 5, 1

54. If optimal page replacement policy is used, then the number of page faults for the above reference string is
- (A) 7                      (B) 6                      (C) 8                      (D) None of these

Consider a process that has been allocated 3 page frames. Assume that system uses pure demand paging. While undergoing execution, the process makes the following sequence of page references

1, 4, 5, 1, 6, 3, 1, 3, 2, 4, 5, 1

55. If LRU is used for the same reference string then which of the following is true?
- (A) Optimal has 22% lesser page faults than LRU  
(B) Optimal has 33% lesser page faults than LRU  
(C) Optimal has 44% lesser page faults than LRU  
(D) None of these

**Q. No. 56 – 60 Carry One Mark Each**

56. George had a very well paid contract with a television advertiser of garden peas and he didn't want to fall out..... the company.
- (A) Of                      (B) with                      (C) over                      (D) under
57. The synonym for the word "GAOL" is
- (A) Destination      (B) Enthusiasm      (C) Bail                      (D) Jail
58. If you take the first left after the post office, you come to Sally's place and if you take the second ..... to the right after that you come to the cottage where Andrew lives.
- (A) Turn                      (B) Turn up                      (C) Turn in                      (D) Turning

59. The moral of this fable is:  
You mustn't ..... children for the mistakes of their parents.  
(A) Reproach (B) Reprieve (C) Repeal (D) Reject
60. Among P, Q, R, S & T each having a different age. Q is 5 yrs younger than T & S is 10 & 8 years younger than P & Q respectively. If T age is 20 years, then what will the R age?  
(A) 28 (B) 56  
(C) None of these (D) Data inadequate

**Q. No. 61 – 65 Carry Two Marks Each**

61. You win some and loose some. You must enjoy winning. But do not let it go to the head. The moment it does, you are already on your way to failure. If you encounter a failure, don't beat yourself for it or anyone else for that matter.  
Accept it, look at your own share in the problem, learn from it and move on.  
Choose the summary:  
(A) Where there is a will there is a way  
(B) Failure is the stepping stone of success  
(C) Winners don't do different things, but do things differently.  
(D) When you lose, do not lose the lesson
62. There are five hotels in a line. If 4 men go into the hotel at 11 am, then what will be the probability that each go into a different hotel?  
(A)  $\frac{124}{125}$  (B)  $\frac{24}{125}$  (C)  $\frac{42}{125}$  (D)  $\frac{48}{625}$
63. A boat is moving downstream and reaches its destination in 25 hr. while moving at a speed of 50 km/hr (given speed in still water). One particular day due to engine problem at mid-point, speed is reduced by 20% of the original. It reaches the destination 2.5 hr late. Find out the speed of the river.  
(Assume its speed to be uniform).  
(A) 10 (B) 20 (C) 15 (D) 5
64. A is 60% as efficient as B. C does half of the work done by A and B together. If C alone does the work in 80 days, then A, B and C together can do the work in  
(A)  $\frac{3}{80}$  (B)  $\frac{4}{50}$  (C)  $\frac{3}{85}$  (D) None of these



65. Study the following Table:

Expenditure of a company (in lakh rupees) per Annum over given years

| Year | Items of Expenditure |                  |       |                   |       |
|------|----------------------|------------------|-------|-------------------|-------|
|      | Salary               | Fuel & Transport | Bonus | Interest on loans | Taxes |
| 1998 | 288                  | 98               | 3.00  | 23.4              | 83    |
| 1999 | 342                  | 112              | 2.52  | 32.5              | 108   |
| 2000 | 324                  | 101              | 3.84  | 41.6              | 74    |
| 2001 | 336                  | 133              | 3.68  | 36.4              | 88    |
| 2002 | 420                  | 142              | 3.96  | 49.4              | 98    |

Total expenditure on all these items in 1998 was approximately. What % of expenditure in 2002?

(A) 72%

(B) 68.5%

(C) 69.45%

(D) 67%