

FOR EVALUATOR'S USE ONLY

Sub. Code : **09**

Optional Paper

Computer Engineering : Paper – I

Time : 3 Hours / Maximum Marks : 200 / Total Pages : 32

Evaluation Table													(For Evaluator's Use Only)	
PART-A				PART-B				PART-C				Grand Total		
QN	E-1	E-2	AC	QN	E-1	E-2	AC	QN	E-1	E-2	AC	PART-A		
1				21				33				PART-B		
2				22				34				PART-C		
3				23				35				Total		
4				24				36				(-) Marks		
5				25				37				Final Total		
6				26				38				Marks in Words		
7				27				39				Remarks of Evaluator/Chief Evaluator		
8				28										
9				29										
10				30										
11				31										
12				32								Remarks of Scrutiniser		
13														
14														
15														
16														
17												Remarks of Scrutiniser		
18														
19														
20												Remarks of Scrutiniser		
Total														
Evalu ator's Sign														

BLANK PAGE



Note : Attempt all the twenty questions. Each question carries 2 marks. Answer should not exceed 15 words.

1 Compute value of X in $2765_8 + F6A_{16} = X_8$.

2 When does an object become eligible for garbage collection ?

3 Obtain complexity of binary search in sorted data using recurrence relation.



4 When is a database relation in 3NF ?

5 Write boolean expression to compute odd parity bit of a 4-bit data $a_3a_2a_1a_0$.



6 Find the output of the following Java Program :

```
public class java prog
{
public static void main (string [ ] args)
{
    int a [ ];
    try
        {
            a = new a [10];
            return;
            a [10] = 10;
            system.out.println ("10th No =" a [10]);
        }
    catch (Exception e)
    {
        system.out.println ("Exception has occurred");
    }
    finally
    {
        system.outp.println ("Finally arrived");
    }
}
```



7 Write a C program that initializes a dynamic memory array of size taken from input.

8 Define minterm and maxterm in context of minimization of boolean expression.

9 If minimum of a partition is selected as pivot element at each step, derive number of iterations needed for *quicksort*.



10 Differentiate horizontal microinstruction with vertical microinstruction.

11 What is Von-Neuman model ?

12 Consider the statement : "OR gate in negative logic is equivalent to AND gate in positive logic." Prove or disprove this statement.



13 What is the output of the following C program ?

```
# include <stdio.h>
main( )
{
    int a, b = 0;
    static int c[10] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 0};
    for (a = 0; a < 10; ++ a)
        if ((c[a] % 2) == 0) b += c[a];
    printf("%d", b);
}
```

15

16

17

09

14 How can a stack be implemented by queue(s) ?



15 How can NaN and Infinity be represented in IEEE floating point standard ?

16 Microprogrammed processor translates the instruction ADD r_1, r_2, r_3 into six micro operations. Write two of them.

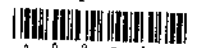
17 Write SQL command that find second maximum value of field1 in table tname1.



- 18 Write pseudocode for recursive preorder in a ternary tree (a node can have upto three children - left, middle and right).

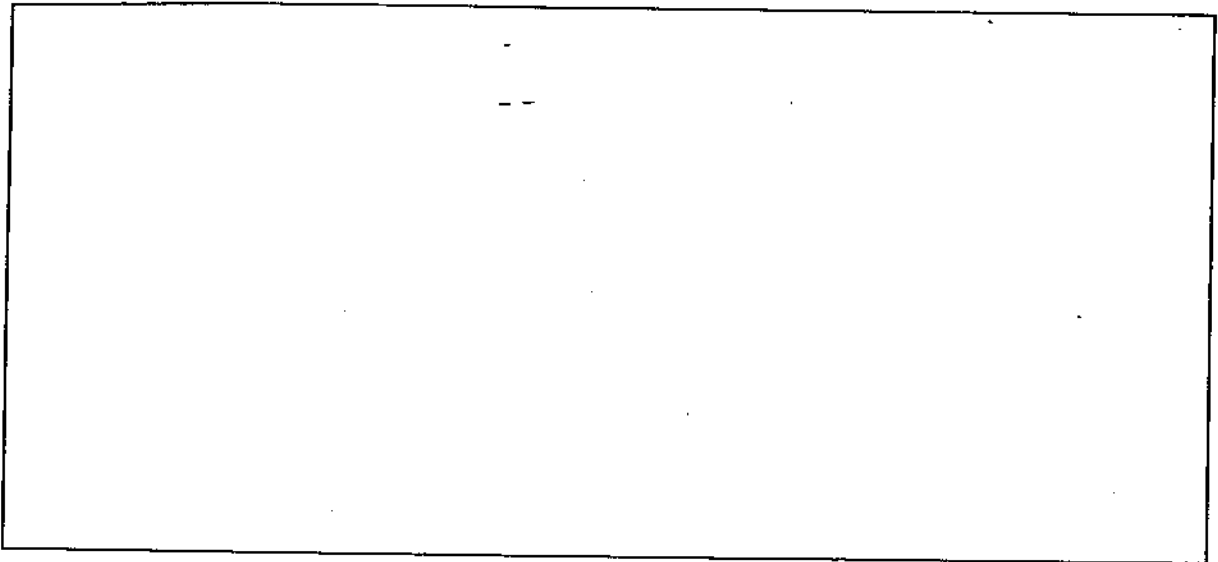
- 19 Suppose a relation $R = (A, B, C, D, E)$ with following functional dependencies $\{CE \rightarrow D; D \rightarrow B; C \rightarrow A\}$
Find all candidate keys and identify best normal form.

- 20 What does ACID stands for ?



Note : Attempt all the **twelve** questions. Each question carries 5 marks. Answer should not exceed 50 words.

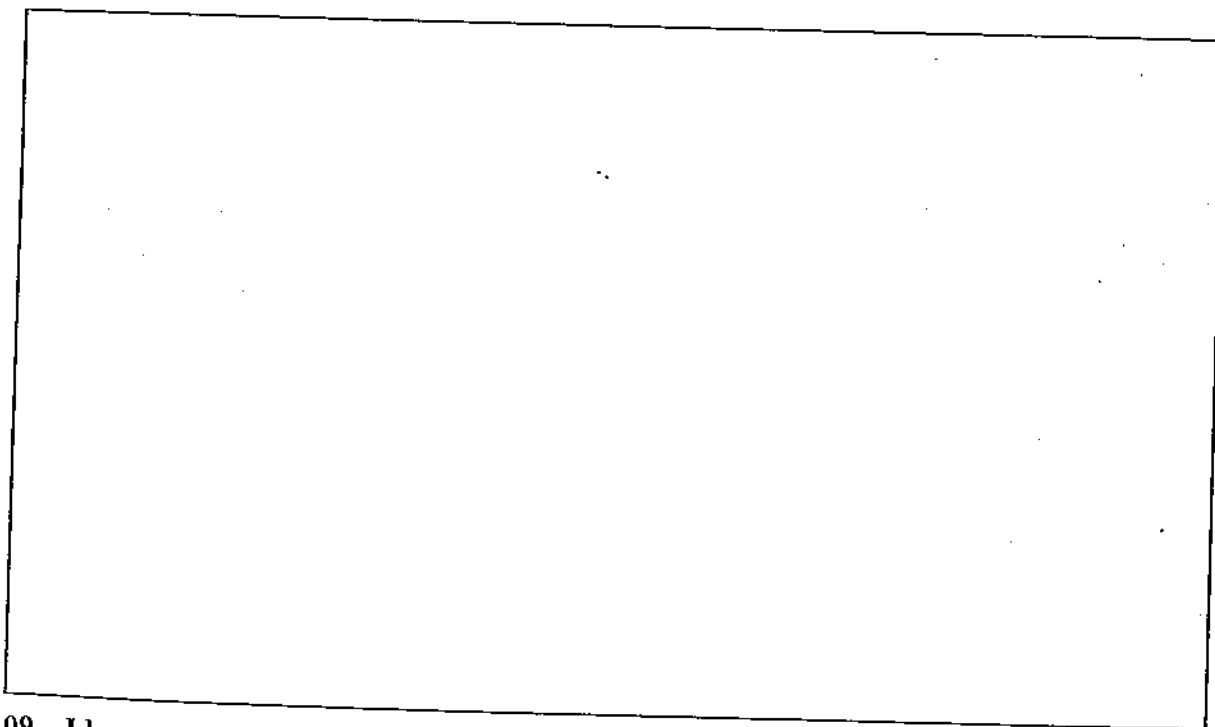
21 Draw K-map of the following function $f(A, B, C, D) = \sum m (0, 1, 2, 3, 5, 7, 8, 9, 11, 14)$.





24 Consider a 2D array as char A[5] [6] stored in contiguous memory locations starting from location 1000" in column major order. What would the address of a[i] [d] ?

25 Design a circuit to compute 2's complement of a binary number.



26 Write pseudocode for deleting a value from Binary search tree. Illustrate working of your method with help of an example.

27 Suggest an appropriate data structure and algorithm that can determine whether set S is a subset of T in $O(n+r)$ time where
 $S = \{x_1, x_2, \dots, x_n\}$ and $T = \{y_1, y_2, \dots, y_r\}$
for $s, 1 \leq x_i \leq m, 1 \leq i \leq n$ and $1 \leq y_i \leq m, 1 \leq i \leq r$ for T
All x_i 's and y_i 's are integers.



28 An adjacency matrix of a matrix of a directed graph is given below. Write its adjacency list.

	A	B	C	D	E
A	0	1	1	0	0
B	0	0	0	1	1
C	0	1	0	1	1
D	0	0	0	0	1
E	0	0	0	0	0

29 If it takes 5 ns to read an instruction from memory, 2 ns to decode the instruction, 3ns to read the register file, 4 ns to perform the computation required by the instruction and 2 ns to write the result into the register file. What is the maximum clock rate of the processor ?



32 Write the SQL queries for the following schema.

Suppliers (Sid, SName, Address)

Parts(Pid, PName, Color)

Catalog(Sid, Pid, Cost)

(a) Find names of parts supplied by "ABC"

(b) Find name of parts for which there is some supplier.



Blank lined page for notes.

09-1]

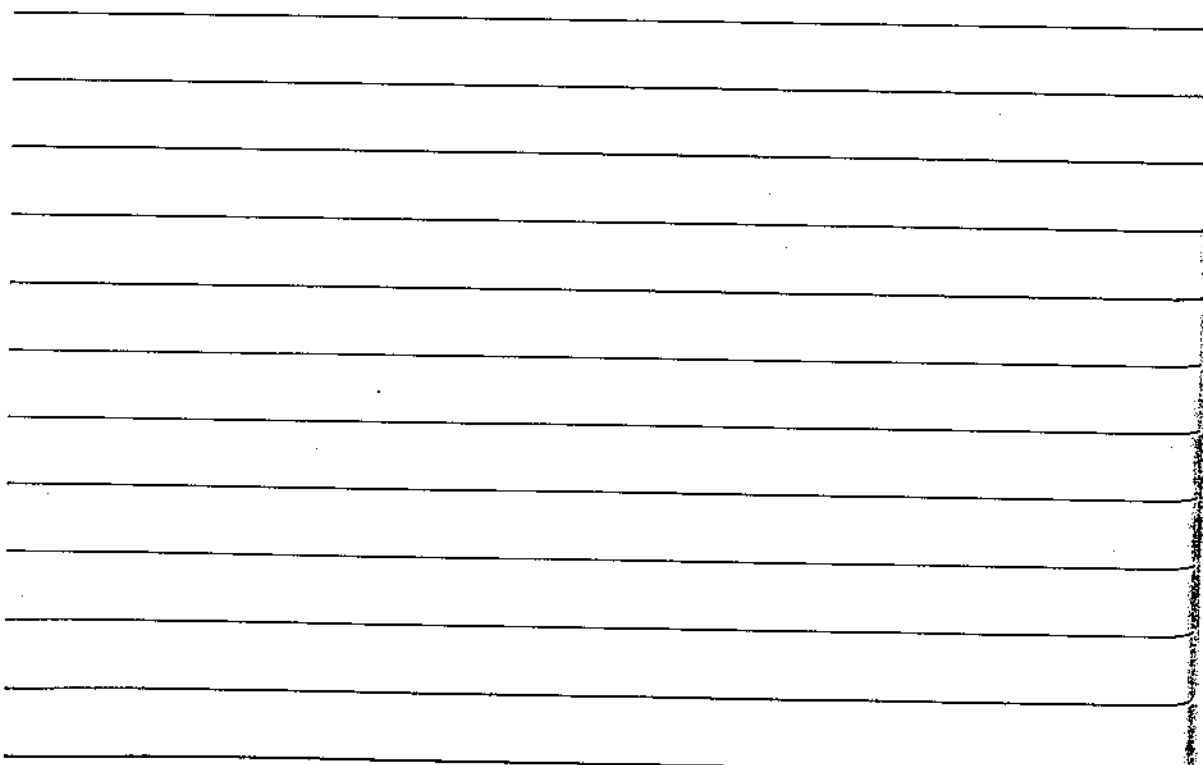
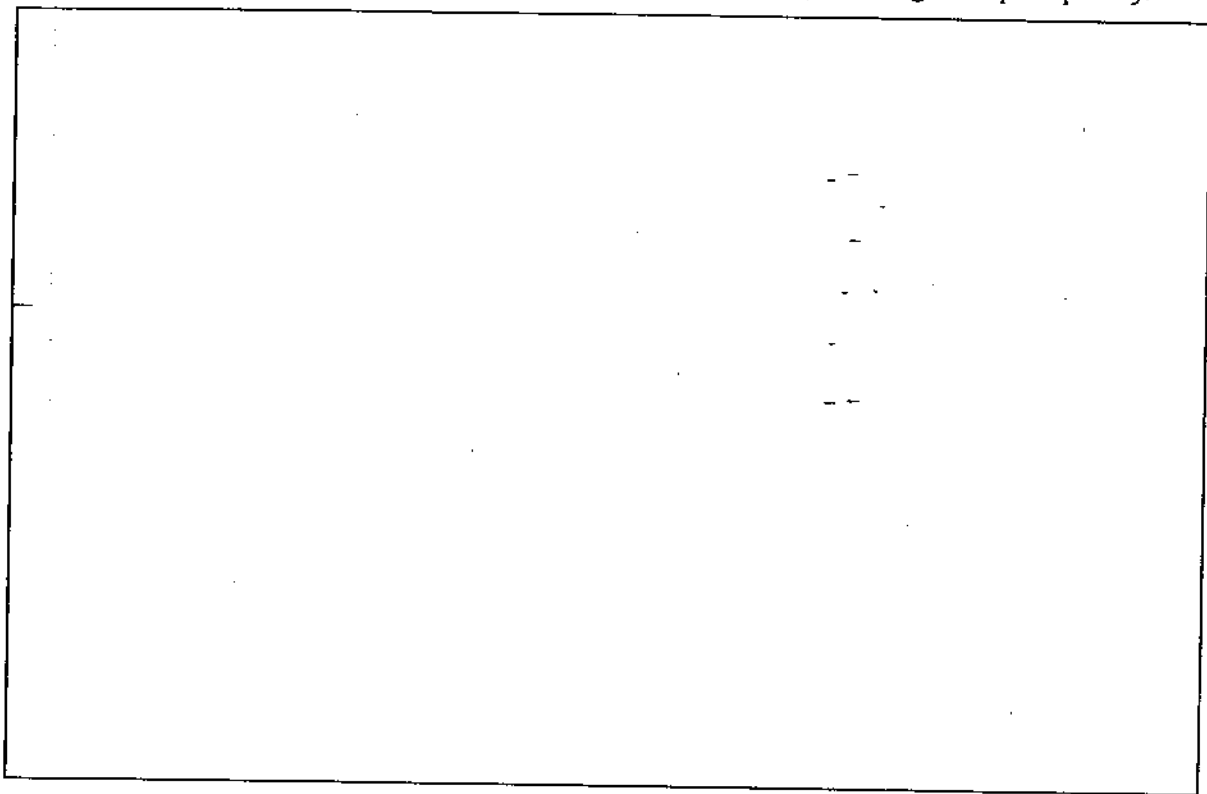
21

[Contd...





36 Design a counter that produces a sequence 0, 3, 5, 6, 2 using T flip flop only.



Lined writing area consisting of approximately 25 horizontal lines.









SPACE FOR ROUGH WORK / रफ कार्य के लिए जगह

09-1]

32

410

