(Set-P)

B.Tech-2nd

Computer Programming

Full Marks : 70

Time : 3 hours

Answer six questions including **Q. No. 1** which is compulsory

The figures in the right-hand margin indicate marks

Symbols carry usual meaning

1. Answer *all* questions : 2×10

(*a*) Briefly define an algorithm. Write down an algorithm to find out biggest between two numbers.

(*b*) Briefly explain a flowchart. What does flow in a flowchart ?

(*c*) State the different types of constants that you can declare and define in the programming language C with appropriate examples.

(*d*) Find out the binary equivalent of the following decimal values : $(0{\cdot}7)_{10}$ and $(0{\cdot}125)_{10}$.

(*Turn Over*)

(*e*) What would be the value of variable x after executing the following code ?
short int x = 1; cout<<~x; // assume short int reserves 2 bytes.
Give proper explanation to your answer.

(*f*) What does the following program print ?

```
#include<stdio.h>
void f(int *p, int *q)  { p=q; *p=2; }
int i=0, j=1;
int main() { f(&i,&j);  cout<<"i="<<i<<"
                    j="<<j<<endl;  return 0; }
```

(*g*) Write down the prototype declaration of the function malloc(). Why do you need to typecast when you are doing dynamic memory allocation using malloc() ?

(*h*) What does the following program print ?

```
#include<stdio.h>
int main() { float f=0.625;
             if(f= = 0.625)
                printf("It is correct\n");
             else
                printf("Absolutely wrong\n");
                                return 0; }
```


(*Continued*)

(*i*) State the differences between an instance of a struct and an instance of a union with appropriate examples.

(*j*) State the differences between a text file and a binary file with example.

2. (*a*) Write a complete C program to find out biggest among three integers using the ternary operator. The user must be asked to enter the three integers. 5

(*b*) Write a complete C program to print the series of prime numbers in between a given upper bound and a lower bound. The upper bound and the lower bound must be specified by the user. 5

3. (*a*) Write a complete C program to create an

(*b*) Write a C program to accept three user input as the three sides of a triangle. Take appropriate type of variables to accommodate real numbers as the sides of that triangle. Develop a correct code to check whether that triangle is a right angled triangle or not and in any case you have to find out the area of that triangle. 5

4. (*a*) Write a complete C program to create a two dimensional array of real numbers that would represent a matrix. Develop a correct code to find out the inverse of that matrix. 5

(*b*) Write a complete C program to create two one-dimensional arrays of size 10 which can be used to store integers and they can be referred as two sets of integers. Initialize these two arrays with user inputs. Develop a code to do the set union operation on these two initialized sets (arrays). Store the result in a third set (array) and display the result. 5

5. (*a*) Define a pointer. What is the size of a pointer ? Differentiate between the following two code blocks : 5

(*i*) int x=10; int *p=&x; *p++; printf("%d",*p);

(*ii*) int x=10; int *p=&x; ++*p; printf("%d",*p);

(*b*) Write a complete C program to create an array of 10 real numbers. Develop a code to traverse that array in reverse direction and print the numbers by using a pointer. 5

6. (*a*) Write a complete C program to create a single dimensional array of 25 integers. The memory allocation for that array must be done dynamically. The array must be initialized through user input. Now develop a code to print the array values in the reverse order of their entry. 5

(*b*) Write a complete C program to print the factorial value of a number by using a recursive function call approach. 5

7. (*a*) Write a complete C program to create a struct named as Employee with members such as emp_id and emp_salary. Create an array of 25 employees and initialize their members. Develop a code to display the details of the employee who is getting the highest salary. 5

(*b*) Write a complete C program to declare and define a user defined function which would accept two integer parameters and is capable of swapping the actual parameter values. The swapping of two variables must be done without using a third variable. 5

8. (*a*) Write a complete C program to find out the smallest among two numbers by using # define preprocessor directive. You should not use any decision control directives like if...else, switch...case, while, do...while or for loop. 5

(*b*) Write a complete C program to create a binary file and write only even numbers available in between 10 to 100 (both inclusive). 5