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: $(0.7)_{10}$ and $(0.125)_{10}$.

(Turn Over)

(2) Ruscalion Structure.

- (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; }</pre>
- (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; }

- (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.
- (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.
- (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.
- 3. (a) Write a complete C program to create an array of 10 characters. The entries to that array must be given by the user and it should not follow any alphabetic order. Once the array is initialized develop a code to sort that character array in alphabetic order and display the result.

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(Turn Over.)

(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.



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

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(Continued)

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

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(Turn Over)

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

