First Semester (Special) Examination – 2013

PROGRAMMING IN C

BRANCH : AEIE, BIOTECH, CHEM, CIVIL, CSE, EC, EEE, ELECTRICAL, ETC, FASHION, IT, MECH, TEXTILE

QUESTION CODE : D 164

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which is compulsory and any five from the rest.
The figures in the right-hand margin indicate marks.

1. Answer the following questions :   2×10

    (a)   What is an Algorithm ? Explain its advantages.

    (b)   What are various data types used in C language ?

    (c)   How do you declare an array of 10 pointers pointing to integers ?

    (d)   What are bit wise operators in C ?

    (e)   What is the output of the following program ?

    ```
    int main()
    {
    int i=5;
    for(;scanf("%s", &i); printf("%d\n", i));
    return 0;
    }
    ```

(f) What would the output of the following program ?

```c
int main()
{
intarr[1]={10};
printf("%d\n", 0[arr]);
return 0;
}
```

(g) Find the output of the following :

```c
int main()
{
int x, y, z;
    x=y=z=1;
    z = ++x || ++y && ++z;
printf("x=%d, y=%d, z=%d\n", x, y, z);
return 0;
}
```

(h) Give an example to illustrate the concept of structures in C.

(i) Find the output of the following program :

```c
void main ()
{ int i = 0 , a[3] ;
a[i] = i++;
printf("%d",a[i]) ;
}
```

(j) Find the output of the following program :

```c
int main()
{
    float arr[5] = {12.5, 10.0, 13.5, 90.5, 0.5};
    float *ptr1 = &arr[0];
    float *ptr2 = ptr1 + 3;
printf("%f ", *ptr2);
printf("%d", ptr2 - ptr1);
    return 0;
}
```

2. (a) Write a program in C to generate first n prime numbers. 5

    (b) Write a C Program to find the Kth smallest element of a given array. 5

3. (a) Declare a 12-element array of pointers to functions. Each function will accept two pointers to double-precision quantities as arguments and will return a pointer to a double-precision quantity. 5

    (b) Write a program to find the transpose of a given n × n matrix A. The matrix A should be declared using pointers. Your program should store the resultant in A only. No additional matrix be used. 5

4. Write down a complete C program that performs the following : 10

    (i) Define an array called grades of size 20 and type int, and another array called names to store student names for 20 students (assume maximum length for name is 9 characters).

    (ii) Read 20 different values of grades and names inside the two arrays using *scanf*. The reading process should be done using loop. The values of grade should be in the range of 0 to 100 inclusive.

    (iii) Calculate the average of the grades..

    (iv) Calculate the highest grade and display the name of the person who has the highest grade.

5. (a) Write a program to count the number of vowels in a given string. 5

    (b) Write an algorithm for swapping two elements without using an extra temporary variable. Implement the same algorithm using call by value principle used in C programming. 5

6. (a) What are command line arguments ? Explain with an example. 4

    (b) Write a program that reads a line of text from a data file character by character and displays the text on the screen. 6
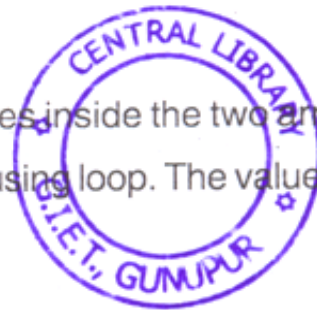
7. (a) What is Dynamic Memory Allocation ? How does it help in developing complex program ? 5

   (b) Write a program in C to create a file which will store student (name, rollno, marks) record. 5

8. Write short notes on any **two** of the following : 5×2

   (a) Storage Classes

   (b) Dynamic Memory Management

   (c) Structure Programming

   (d) Self-Referential Structure.

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