Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA Sem-I Examination January 2010

Subject code: 610001

Subject Name: Fundamental of Programming (FOP)

Date: 19 / 01 /2010 **Time: 12.00 – 2.30 pm**

Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** What are the major components of C program? State significance of the name 'main'. **03**

(b) Write a note on process of compilation. **03**

(c) Do as directed : **08**

(i) State what will be the output of following code :

```
void main()
 {  int i,j,k,a ;
    i=2; j=5 ;
    k= (++i)*(j--);
    a = k+ (i++) – (++j);
   printf( "%d %d ",k,a);
}
```

(ii) Write an algorithm to read a value of N and generate sum of first N odd natural numbers.

(iii) Compare use of if-else statement with the use of ? : operator. When will you prefer to use ? : operator? Why ?

(iv) Explain use of escape sequence with an example.

Q.2 **(a)** What is purpose of the getchar() and putchar() functions? How they are used within a C program? Compare them with gets() and puts() functions respectively for string handling operations. **07**

(b) What is meant by looping? Describe two different forms of looping. Explain use of each form using appropriate example. **07**

OR

(b) Compare use of switch statement with the use of nested if-else statement. Which is more convenient? Why? Also explain importance of break statement with an example. **07**

Q.3 **(a)** What is an array? Explain the procedure to initialize one-dimensional and two dimensional array. **04**

(b) Write a C program to read a matrix and find out the maximum element and its position in the matrix. **04**

(c) What is a function? State advantages of using functions. Write a program using function to calculate sum of digits of a given positive integer number. **06**

OR

Q.3 **(a)** In what way does an array differ from an ordinary variable? Explain internal representation of arrays in C. **04**

(b) Write a C program to count number of characters in a given string. **04**

(c) Write a brief note on following : **06**

(i) Recursive functions and their applications.

(ii) Advantages of command line arguments.

(iii) Local vs. global variables.

Q.4 **(a)** What is a pointer? Why are they important? Explain usage of NULL pointer. **04**

(b) State and explain, what following statements will do ? Why ? **04**

(i) int a, *b = &a;

(ii) char *s;

(iii) a = (float *) &x;

(iv) double (*a)[12];

(c) What is a structure? Differentiate between structure and union. Declare and initialize a structure array to hold birthdates of three persons. Assume that value of day, month and year are of type integer. **06**

OR

Q.4 **(a)** Explain usage of malloc() and realloc() functions. **04**

(b) State and explain with reasons what will be output if any for following statements? **04**

(i)
```
void main()
{   int x= 0, *p=0;
    x++ ; p++;
    printf("%d and %d " , x,p);
 }
```

(ii)
```
void main()
 {  int a [] = {1,2,3,4,5,6,7,8,9};
   int *p = a+1;
   int *q = a+6;
   printf("\n %d", q-p);
 }
```

(c) Write a short note on following : **06**

(i) Enumerated data types.

(ii) Nesting of structures.

Q.5 **(a)** Define following terms : **04**

(i) File

(ii) Buffer

(iii) File pointer

(iv) Library functions

(b) Write short note on storage classes available in C. **04**

(c) Compare array and linked list? List advantages of linked list. Write a C program to insert a node at the beginning of a singly linked list. **06**

OR

Q.5 **(a)** State use of bitwise operators. Describe the three logical bitwise operators. **04**

(b) What is a processors directive? State advantages and types of processors directives. **04**

(c) Write a short note on following **06**

(i) Operations on singly linked list.

(ii) Character input functions for files.

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