BCS-01

Roll No. 2 0 1 7 0 3 1 0 3 3

B. Tech. (EC/EE/ ME/CH)
EVEN SEMESTER
MAJOR EXAMINATION 2017 - 2018

Introduction to Computer Programming

Time: 3 Hrs. Max. Marks: 50

Note: Attempt all questions. Each question carries equal marks.

1. Attempt any five parts of the following: $(5\times 2 = 10)$

(a) Differentiate the following:
i) interpreter and compiler
ii) low level language and high level language

(b) Write a program in C to print the alternate elements of the Fibonacci series upto 20 terms.

(c) Write a program in C to print the sum of following series up to 10 terms. You may take any value of x.
$1 - x^2/!2 + x^4/!4 - \ldots\ldots\ldots\ldots$

(d) Find the output of following programs, discuss the reasons and show your calculations in your answer sheet.

i) Inputs entered by user are: 26715 98

```
void main( )
{
  int  p,  q;
  scanf ( "%2d%5d",  &p,  &q) ;
  printf("%d%d",  p,  q);
  printf("%7.2f",  78.6122)
  }
```

ii)

```
void main( )
{
 if(2<1);
 else
  x = (2<0) ? printf("one") : printf("four");
  printf("%d",  x);
  }
```

(e) Write a program in C to print the all BUZZ numbers between 1 to 100. A number is said to be BUZZ number if it ends with 7 or is divisible by 7.

(f) Write a program in C to print the following pattern:

```
                9
            8       7
        6       5       4
    3       2       1       0
```

(g) Write short notes on the following:

i) microcontroller ii) micro computer iii) mini computer iv) microprocessor

2. Attempt any two parts of the following: $(2\times 5 = 10)$

(a) Write a program in C to accept 50 numbers and print the second smallest and third largest numbers among them.

(b) Write a program in C to store two sorted arrays in the third array in descending order.

(c) Write a program in C to sort a set of names stored in an array in alphabetical order.

3. **Attempt any two parts of the following:** **(2× 5 = 10)**

(a) Write a program in C which accept the radius and height in main function and pass them to functions. Functions calculate the area, volume and perimeter of a cone and their values get printed in main function.

(b) Write a program in C to find the GCD of two numbers using recursion function. Also, find the output of following programs, discuss the reasons and show your calculations in your answer sheet.

i)
```
int i;
void increment( )
{
  i = i + 1;
  printf ( "%d", i );
 }
void main( )
{
 printf ( "%d", i );
 increment( );
 increment( );
 }
```

ii)
```
void foo(int *p)
{
 int j = 2;
 p = &j;
 printf("%d ", *p);
 }
int main( )
{
 int i = 97, *p = &i;
 foo(&i);
 printf("%d ", *p);
 }
```

(c) Write a program in C to print the prime position elements of an array. For example: 16 20 3 76 25 23 123 12 303 1 45 0 67..... are array elements. You have to print 20 3 25 123 45 67.....

Also, find the output of following programs, discuss the reasons and show your calculations in your answer sheet.

i)
```
int x = 10;
void main( )
{
 extern int y;
 printf ( "%d %d", x, y );
 }
int y = 20;
```

ii)
```
int x = 30;
void display( )
{
  int x = 15;
  printf ( "%d", x );
  }
void main( )
{
  display( ) ;
  printf ( "%d", x );
 }
```

4. **Attempt any two parts of the following:** **(2× 5 = 10)**

(a) Write a C program to split an array from particular position and add first part to the end. Also, write the short notes on the following:

i) file handling **ii)** static memory allocation **iii)** dynamic memory allocation

(b) Write a C program to swap three numbers in cyclic order using call by reference. For example, if a = 1, b = 2, c = 3; after swap: a = 3, b = 1, c = 2. Also, write a program in C to fill the array and print the odd position elements of an array using pointer.

(c) Write a program in C to create a union that contains the following details about book: Author name, Book page, Book price. Consider there are100 books. Print the details of all books using function and access the union elements using pointer.

5. **Attempt any two parts of the following:** **(2× 5 = 10)**

(a) Consider there are 100 students. Details corresponding to each student are Roll number, Name, Brach, Year of joining. Write a program in C to construct the structure that contains the above details and print the details of all students who have same year of joining by passing 'structure elements' to the function and 'structure variable' to the function.

(b) Write a program in C to print all permutations of a given string using pointer.

(c) Write a program in C that takes two set as input and print cartesian product of two sets.

e.g. Input: A = {1, 2}, B = {3, 4}

Output: A × B = {{1, 3}, {1, 4}, {2, 3}, {2, 4}}