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3 (Sem 1) CSC M1

2015

**COMPUTER SCIENCE**

**(Major)**

Paper : 1.1

**(Computer Fundamentals and Programming)**

Full Marks – 60

Time – Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following questions :  $1 \times 7 = 7$

(a) Printer is a secondary storage device. (State true or false).

(b) The expression  $11\%3$  evaluates to ..... (Fill in the blank).

(c) Choose the correct option.

The break statement causes an exit

(i) only from the innermost loop

(ii) only from the innermost switch

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(iii) from all loops and switches

(iv) from the innermost loop or switch.

(d) Choose the correct output for the following code segment :

```
int main ( )
{ int i = 2, x ;
  x = ++i + ++i;
  printf ("%d", x);
}
```

(i) 4      (ii) 6      (iii) 8      (iv) 7

(e) Choose the correct statement.

- (i) Pointers and integers are interchangeable.
- (ii) A pointer and an integer may be added or subtracted.
- (iii) There is no relationship between pointers and arrays.
- (iv) It is not possible to pass a part of an array to a function.

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(f) Choose the correct statement.

- (i) In the absence of explicit initialization, external and static variables are guaranteed to be initialized to zero.
- (ii) It is possible to take the address of a register variable.
- (iii) The external static variables are globally accessible.
- (iv) For automatic variable, the initializer is restricted to being a constant.
- (g) If there is any error in opening a file, the `fopen ( )` function returns ..... (Fill in the blank)

2. Answer the following questions :       $2 \times 4 = 8$

- (a) What is bootstrapping ?
- (b) Perform  $(25)_{10} + (-17)_{10}$  using 2's complement representation.
- (c) What is meant by associativity ? What is the associativity of the arithmetic operators ?

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(d) Find the output of the following program :

```
# include <stdio.h>
int main ( )
{ int i = 0, x = 0;
  while (i<20)
  { if (i%5 == 0)
    { x += i;
      printf ("%d", x);
    }
    i ++;
  }
  printf ("\n x = %d", x)
}
```

3. Answer any *three* questions : 5×3=15

- Give a brief introduction of major components of a Digital Computer.
- List the important characteristics of well-written computer program.
- Draw a flow chart to reverse the digits of an integer.

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(d) Explain the difference between a function declaration and a function definition. When is a function declaration required?

(e) Write a function that will return the GCD of two integers.

(f) What is recursion? How it works?

4. Answer any *three* questions : 10×3=30

(a) Write a program to find the sum of the following series :

$$x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \dots$$

corrected upto 4 decimal place.

(b) Write a program to merge two sorted arrays.

(c) Define functions to perform following tasks

(i) Sort an array in ascending order

(ii) Check if a given square matrix is symmetric or not.

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(d) Define functions to perform following tasks without using library functions.

(i) Copy a string to another string.

(ii) Concatenate two strings.

(e) Explain the following functions with example.

(i) f open ( )

(ii) f seek ( )