# INTRODUCTION TO COMPUTING
## (CSEN 1201)

**Time Allotted : 3 hrs**                                        **Full Marks : 70**

*Figures out of the right margin indicate full marks.*

*Candidates are required to answer Group A and*
*<u>any 5 (five)</u> from Group B to E, taking <u>at least one</u> from each group.*

*Candidates are required to give answer in their own words as far as practicable.*

## Group – A
### (Multiple Choice Type Questions)

1. Choose the correct alternative for the following:                    **10 × 1 = 10**

   (i) Which is valid C expression?
   (a) int my_num = 100,000               (b) int my_num = 100000
   (c) int my num = 1000                  (d) int $my_num = 10000.

   (ii) Which of the following cannot be a variable name in C?
   (a) Volatile       (b) True           (c) Friend         (d) Export.

   (iii) Which of the following declaration is not supported by C language?
   (a) String str                      (b) Char *str
   (c) Float str = 3e2              (d) Both String str; & float str = 3e2.

   (iv) What will be the output of the following C code?
   ```
   #include <stdio.h>
   int main()
   {
      int y = 10000;
      int y = 34;
      printf("Hello World! %d\n", y);
      return 0;
   }
   ```
   (a) Compile time error           (b) Hello World! 34
   (c) Hello World! 1000           (d) Hello World! followed by a junk value.

   (v) What will be the final value of x in the following C code?
   ```
   #include <stdio.h>
   void main()
   {
      int x = 5 * 9 / 3 + 9;
   }
   ```
   (a) 3.75     (b) Depends on compiler        (c) 24         (d) 3

(vi)    What will be the output of the following C function?

```c
#include <stdio.h>
void reverse(int i);
int main()
{
  reverse(1);
}
void reverse(int i)
{
  if (i > 5)
    return ;
  printf("%d ", i);
  return reverse((i++, i));
}
```

(a) 1 2 3 4 5                                              (b) Segmentation fault
(c) Compilation error                                (d) Undefined behaviour

(vii)   How many times i value is checked in the following C program?

```c
#include <stdio.h>
int main()
{
  int i = 0;
  while (i < 3)
    i++;
  printf("In while loop\n");
}
```

(a) 2                    (b) 3                    (c) 4                    (d) 1

(viii)  What will be the output of the following C code?

```c
 #include <stdio.h>
int main()
{
  int i = 0;
  do
  {
    i++;
    if (i == 2)
      continue;
    printf("In while loop ");
  } while (i < 2);
  printf("%d\n", i);
}
```

(a) In while loop 2                          (b) In while loop in while loop 3
(c) In while loop 3                          (d) Infinite loop.

(ix)    What are the elements present in the array of the following C code?
```
int array[5] = {5};
```
(a) 5, 5, 5, 5, 5
(b) 5, 0, 0, 0, 0
(c) 5, (garbage), (garbage), (garbage), (garbage)
(d) (garbage), (garbage), (garbage), (garbage), 5.

(x)    What will be the output of the following C code?
```
#include <stdio.h>
int main()
{
    char str[11] = "hello";
    char *str1 = "world";
    strcat(str, str1);
    printf("%s %d", str, str[10]);
}
```
(a) helloworld 0                   (b) helloworld anyvalue
(c) worldhello 0                    (d) Segmentation fault/code crash.

# Group- B

2.  (a)    Draw a flowchart to check whether a number is prime or not.
    (b)    Convert from one number system to the other:
           (i) $(29.65)_{10} = (?)_2$     (ii) $(364364364)_8 = (?)_{16}$
    (c)    Simplify the expression: AB+A(B+C)+B(B+C)

**5 + (2 + 2) + 3 =12**

3.  (a)    What will be 32-bit full precision floating representation for 24.75?
    (b)    State the differences between compiler and interpreter.
    (c)    Draw a logic circuit to simulate an XOR gate by using only NOR gates. (Minimum number of NOR gates should be used)

**6 + 3 + 3 = 12**

# Group - C

4.  (a)    Write a program to check a number is palindrome number or not?
    (b)    What is type casting? Explain the types of it with proper example.
    (c)    Write a program to print all the prime numbers from x to y, where x is the upper limit and y is the lower limit.

**4 + 4 + 4 = 12**

5.  (a)    Write a program to find the GCD of two numbers using recursion.
    (b)    Write a program to print the pattern where no of rows of the pattern should be given by the user.
```
* * * * *
 * * * *
  * * *
   * *
    *
```

**6 + 6 = 12**

# Group - D

6. (a) Write the difference between Entry controlled loop and exit controlled loop. Explain with the example.
   (b) Write the difference between calloc() and malloc()

**6 + 6 = 12**

7. (a) Explain call by value and call by reference with suitable example.
   (b) Write a program that multiplies two matrices of dimensions m × n and p × q, using a function.

**4 + 8 = 12**

# Group - E

8. (a) Differentiate between break and continue with proper examples.
   (b) Distinguish between int *p[10] and int (*p)[10].
   (c) Write a program in C to define a structure named student with members - name (string), roll (integer) and CGPA (float). It should be able to take n many students and details as input and print the details of the student who obtained highest CGPA.

**(1.5 + 1.5) + (1 + 1) + 7 = 12**

9. (a) Distinguish between the file open modes "w+" and "a+". Explain the function feof( ) with an example.
   (b) What is command line arguments in C? Explain with example.
   (c) What is the function of strlen(), strcat(), strcpy() and strcmp() explain with proper example.

**(2 + 1) + (2 + 1) + (1.5 + 1.5 + 1.5 + 1.5) = 12**