B.Tech/AEIE/BT/CE/CHE/CSE/ECE/EE/IT/ME/2nd Sem/CSEN-1201/2015

2015

INTRODUCTION TO COMPUTING

(CSEN 1201)

Time Alloted : 3 Hours   *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

<u>GROUP - A</u>
(Multiple Choice Type Questions)

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

   i)   Which of the following syntax is correct for command-line
         arguments?

         (a) int main(int var, char *varg[ ])

         (b) int main(char *argv[ ], int argc)

         (c) int main()
             {
                 int argv, char *argc[ ];
             }

         (d) Both (a) and (b)

ii) Which of the following statements is FALSE?

(a) Array bound is not checked in C

(b) Local variable gets precedence over global variable

(c) Garbage collection is not automatic in C

(d) main() is a function with no default return type.

iii) Which is FALSE?

(a) Constant variables need not be defined as they are declared and can be defined later.

(b) Global constant variables are initialised to zero.

(c) const keyword is used to define constant values.

(d) You cannot reassign a value to a constant variable.

iv) In command line argument, argc is

(a) Argument constant   (b) Argument copy

(c) Argument count   (d) Argument character

v) Select the fastest memory unit

(a) Register   (b) Cache

(c) RAM   (d) Hard disk

vi) In which part of the program compilation process macros are dealt with?

(a) Assembly   (b) Pre-processing

(c) Linking   (d) None of the above

vii) Meaning of x >> 3 is same as,

(a) x / 3   (b) x * 8

(c) x * 3   (d) x / 8

viii) What will be the value of y after these three lines?

```
int x = 11, y;
float z = 5.5;
y = x%z;
```

(a) 0   (b) 1

(c) 5   (d) compilation error

ix) What will be the output?

```
#define SQUARE(X) X * X
int main ()
{
    printf ("\n Square = %d" , SQUARE(10+2) );
    return 0;
}
```

(a) 144   (b) 32

(c) 122   (d) 12

x) What will be the output of the following loop?

```
int x = 2, y = 6, z = 6;
while(z > 0)
{
    z= (++y + z) % x ;
    printf("%d ",z);
}
```

(a) 1 0 1   (b) 1

(c) 1 0 1   (d) 1 1 0

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 two differences between a compiler and an interpreter.

   (c) What is a universal logic gate?

   (d) Draw a logic circuit to simulate an XOR gate by using the minimum number of NAND gates. [Note: If N is the NAND function, then N(N(a, N(a, b)), N(b, N(a, b))) = a XOR b, is an identity.]   6+2+1+4 = 12

GROUP - C

4. (a) Write a program to check whether a number in its decimal representation is a palindrome or not, without using array. [Note that in such a number, the value remains unchanged if the digits are taken from left to right (normal) or from right to left.]

   (b) Write a function ceil( ) with prototype int ceil(float), so that it converts a floating point number into the smallest integer which is not less than the number. [Example: ceil(1.02) will return 2.00 and ceil(−1.02) will return −1.00.]   8+4 = 12

5. (a) Write a program to calculate mean of k numbers provided at run-time, without using an array. The program will take the value of k as input followed by k more numbers.

(b) Write a function to return the sum of the series $x + x^3/2! + x^5/4! + ...,$ upto the n-th term. Both x and sum are double. The function takes x and n as arguments.

$$6+6 = 12$$

Group - D

6. (a) Write a program to input a multiword string where words are separated by blank space. The program should print the whole string by printing the words placed in the odd positions same as in the input and by reversing the words placed in the even positions. [Example: "Test your program". The output for the sample input will be "Test ruoy program". You may use the C-library functions 'strchr()' or 'strtok()' but must implement your own function to reverse a string. Assume that the first word of the string is in the 1-th position.]

(b) How does a local static variable behave differently from a local variable in a function? $10+2 = 12$

7. (a) Write a program to input a multi-word string with words separated by single blank spaces and return the n-th word (n will also be provided by the user). If the string has less than n words, your program prints "Not Found". You may use either 'strchr()' or 'strtok()'.

(b) What is scope and longevity of a variable? Compare scope and longevity for local, extern and static variables.

(c) What is the difference between opening a file in write mode and in append mode? $6+(1+3)+2 = 12$

Group - E

8. (a) Write a program taking exactly two inputs from the command line to copy contents of one file and copy it to another file. The command line arguments are the source and the destination file names, respectively.

   (b) Write a program that takes two strings as command line arguments and compares them to see whether they are same or not. Do not use any function from the string library.   6+6 = 12

9. (a) Write a program to define a structure named student with members - name (string), roll (integer) and CGPA (float). It should be able to take n many students' details as input and print the details of the student with the highest CGPA.

   (b) Write a program to dynamically allocate two square matrices and add them. The size of the matrices and their values should be taken as input from the user. Store the resulting sum in another dynamically allocated matrix, and print the values of the sum matrix.
                                                        6+6 = 12