(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1150 Roll No. 1 3 0 3 2 1 4 0 0 1

MCA

(SEM. I) ODD SEMESTER THEORY EXAMINATION 2013-14

PROBLEM SOLVING AND COMPUTER PROGRAMMING WITH C

Time : 3 Hours *Total Marks : 100*

Note :– (1) Attempt **all** Sections.

(2) All questions carry equal marks.

SECTION–A

1. Attempt **all** parts : **(10×2=20)**

(a) What are basic functions of Operating Systems ?

(b) Explain differences between "while" and "do-while" loop with example.

(c) Explain difference between "if-else" and "switch-case" with example.

(d) Draw flow chart for generating Fibonacci series.

(e) Explain difference between "Structure" and "Union" with an example.

(f) What is a String ? State the various operations that can be performed on it.

(g) Write commands for performing the following operations in Linux :

(a) To rename OR move a file.

(b) To set read write permission only to the owner.

(h) Write the output of the following program :

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

(i) What is the purpose of a Header File ? Is the use of header file absolutely necessary ? Can we have a C program without any header file ?

(j) What is an Operator ? Write different types of operators in C.

SECTION–B

2. Attempt any **three** parts : (3×10=30)

(a) Convert the following numbers in their mentioned base :

(i) $(257.34)_8 = (?)_6$

(ii) $(AB9.CD)_{16} = (?)_9$

(iii) $(342.25)_6 = (?)_3$

(iv) $(10110111.11)_2 = (?)_{10}$.

(b) What do you understand by C preprocessor ? Explain the purpose of at least four C-preprocessors.

(c) Write a recursive function to compute the greatest common divisor among 'n' numbers.

(d) What is meant by the storage class of a variable ? Name the four storage class specifications included in C. Discuss with example.

(e) Write a program to print the following pattern :

```
* * * * * * * * *
  * * * * * * *
    * * * * *
      * * *
        *
```

SECTION–C

3. Attempt any **five** parts : (5×10=50)

(a) Write a program to create an array of structure to hold records of 20 cricketers. Each record contains name, country, age, and average runs scored by a player. Further write a function to pass these records as argument. In the function definition, find the record of the player whose average is maximum and display his details back in the calling function.

(b) Draw flow chart to count the number of spaces, commas and periods in a user input string.

(c) Draw flow chart to input 'n' numbers from user. Calculate sum of digits of all even numbers and display it.

(d) Ackerman's function is defined as follows :

$A(m,n) = n+1$ if $m=0$

$A(m,n) = A(m-1,1)$ if $m \neq 0, n=0$

$A(m,n) = A(m-1, A(m, n-1))$ if m!=0, n!=0

Write a recursive function in C to compute Ackerman value for a user input.

(e) Write a program to input numbers in an array. Further create a function which arranges the elements of the array from smallest to largest using pointers.

(f) Write a program to store customer data in a file say "customer.txt" as follows :

S.No.	Customer	Age
1	Archie	22
2	Jughead	21
3	Betty	23
4	Veronica	18
5	Joey	24
6	Chandler	25

Further read the records from the file and create an array of customers to store them and display only those customers, data who are older than 20 years.

(g) What are bit wise operators in C ? What is their significance ? Illustrate them with suitable example.

(h) Write a program in C to copy the contents of a text file to another file. Also store the total count of blank spaces in the second file.