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

PAPER ID : 1601	Roll No.										

B. Tech.

(SEM. I) THEORY EXAMINATION 2011-12

COMPUTER CONCEPTS AND PROGRAMMING IN C

Time : 3 Hours　　　　　　　　　　　　　*Total Marks : 100*

SECTION—A

Note :— This section contains **ten** questions. Attempt **all**. Each question
carries equal marks.　　　　　　　　　**(10×2=20)**

1.　(a)　Explain types of errors while compilation and execution of
C programs.

　　(b)　What is the value of 2^3 ?

　　(c)　What is Kernel ?

　　(d)　Explain purpose of continue statement in C with example.

　　(e)　What is top down approach ?

　　(f)　What will be the output of the following code ?

　　void main ()

```
{
int a=5, b=6, c;
```

```
c=a++ > b && ++b < 10;

printf ("%d %d %d", a, b, c);

}
```

(g) What will be the output of the following code ?

```
void main ( )

{

int a=5, b=6;

printf("%d\t", a=b);

printf("%d\t", a= = b);

printf("%d\t%d",a,b);

}
```

(h) Consider the following program,

```
#define square(x) x*x

main( )

{

int i;

i = 64/square(4);

printf("%d",i);

}
```

Give the output of the above program.

(i) For the code segment

struct DOB {int date, month, year;}

struct Person {char name[20]; struct DOB birthdate;}p,*ptr=&p;.

Write at least two valid expressions to access year of birthdate.

(j) Define pointer and its importance.

SECTION—B

Note :– There are five questions in this section. Attempt any three. All questions carry equal marks.

$(3 \times 10 = 30)$

2. (a) (i) What is digital computer ? Draw block diagram of digital computer and explain each component of it.

(ii) What are different data types in C-language ? Explain range, memory size of each with its format specifier.

(b) (i) What is flowchart ? Discuss advantages and limitations of flowchart. Draw a flowchart to generate first 20 members of the following sequence 0, 0, 1, 1, 2, 2, 3, 3.......................

(ii) What is structured programming ? Explain and give examples of relevant constructs using pseudo-code. Highlight the advantages and disadvantages of structured programming.

(c) (i) What is recursion ? Write a recursive procedure to find the sum of n positive integers i.e. $n + (n-1) + (n-2) + \ldots\ldots\ldots +3+2+1$.

(ii) Explain the difference between parameter passing mechanism "Call by value" and "Call by reference". Which is more efficient and why ?

(d) (i) What is Macros ? How is it substituted ? Write a program that illustrates the use of macros with argument.

(ii) Develop an algorithm to display all prime numbers between given range.

(e) Convert the following :

(i) $(bc)_{16} + (de)_{16} = ()_{16}$

(ii) $(45)_6 = (?)_3$

(iii) $(-5)_{10} = (?)_2$

(iv) $(ABC.F2)_{16} = (?)_8$

(v) $(10001)_{10} = ()_2$

SECTION—C

Note :— There are **five** questions in this section. Attempt any **two** parts from each question. All questions are compulsory and carry equal marks.   (5×10=50)

3. (a) Explain dynamic memory allocation with the help of an example.

(b) Compare DOS, Windows and Unix Operating Systems. List five commands of DOS and Unix OS.

(c) Write a C program to read a number having more than 5 digits and print whether the given number is divisible by 11 or not by using the algorithm which states that a number is divisible by 11 if and only if the difference of the sums of digits at odd positions and even positions is either zero or divisble by 11.

4. (a) Explain the different types of Storage Classes with examples.

(b) Write a program to find length of a string which is given through command prompt. Program should give the output as follows :

C:\> length Hello

Length of string "Hello" is 5

(c) Write a program which reads a name from keyboard and produces output in the given format e.g. if the input is **Sarvepalli Radhakrishnan** then it produces output like **S. Radhakrishnan**.

5. (a) Compare Compiler, Interpreter, and Assembler.

   (b) Write short note on stack.

   (c) Develop a program to multiply two matrices. Input order of matrices from the user. Your program should take care of the fact that no element of either matrix can be negative.

6. (a) Declare a two dimensional character array and store the values as "Zero", "One", "Two", "Three", "Four", "Five",...... Accept a no. and display it in words. e.g. if no. is 3450 then with the help of the array it should be displayed as "Three Four Five Zero".

   (b) Expalin any sorting algorithm. And apply this algorithm to sort list of 10 integers in descending order.

   (c) Create a file "number.dat" and store list of 100 integers in it. Using the file "number.dat", write a C-program which creates two more files to store even and odd integers separately.

7. (a) Explain memory hierachy with the help of diagram.

   (b) Write a function, say float f (float x), to compute f(x) where :

   $$f(x)=\begin{cases} 5\times2+7 & \text{if } x < 4.5 \\ 7\times2-10 & \text{if } x >= 4.5 \end{cases}$$

   (c) Define a structure to store employee records e.g. employee id, employee name and salary of employee. Using this structure write a 'C' program to create a file "employee.dat". There must be one record for every employee in the file. Accept the data from the user. Using the file "employee.dat", display the details of employee whose employee id is entered by the user.