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MANIPAL INSTITUTE OF TECHNOLOGY MANIPAL UNIVERSITY, MANIPAL - 576 104 First Semester MSc. Examination – Nov/Dec 2015 SUB: C-PROGRAMMING TECHNIQUES (MAT-609)

Time: 3 Hrs.

Max. Marks: 50

Note: a) Answer any FIVE full questions. b) All questions carry (3+3+4) marks.

- 1. a) Explain the different primary datatypes available in C.
 - b) With proper syntax and examples, explain any three string handling functions.
 - c) Write a C-program to generate n Fibonacci numbers and indicate the prime numbers within that list.
- 2. a) Define flowchart. Write an algorithm to compute the largest of any three numbers and draw the corresponding flowchart.
 - b) Write C-program using pointers to exchange the values of two variables.
 - c) Evaluate the following C expressions:
 - i. 5*'A' (('Z'/2)/3)
 - ii. int i = 5, j = 8;
 - (i++)+(j--)+(--j)
 - iii. ((8+5)/3)%2-4
 - iv. float x = 0.5, y = 0.75; (x > y)?x - y: y - x
- 3. a) Distinguish between *break* and *continue* statements.
 - b) Write a C-program to count the no. of letters, digits, special symbols and blank spaces in a given string data.

c) Calculate the output of the following code snippets:

```
i.main()
                               ii.int M[5]={1,2,3,4,5};
                                  int i,a=0,b=0,c=0,d=0;
{
int stat(int),i;
                                  for(i=0;i<5;i++)</pre>
for(i=7;i>0;i--)
                                   {
printf("%d\t",stat(i));
                                   if (M[i]%2 != 0)
                                        a=(c++,a+M[i]);
return 0;
                                   else b=(d++,b+M[i]);
}
int stat(int k)
                                  printf("d\t,d",c,d);
{
                                 printf("\n%d\t%d",a,b);
static int n=0;
return (n+=k);
}
```

4. a) Explain each of the following C tokens with an example:

- i. extern ii. gets() iii. &&
- b) Explain, in brief, the working of a *do-while()* loop in C with an example.
- c) What is an array? How are one-dimensional arrays declared and initialized? What are multidimensional arrays?
- 5. a) Write a recursive user-defined function to calculate the sum of digits in an n-digit number.
 - b) Explain *auto* and *static* storage classes.
 - c) Write a short note on each of the following:
 - i. Type Casting ii. Conditional operator
- 6. a) How does a structure differ from an array? Define a structure that can describe a hotel. It should have members that include the name, address, grade, average room charge, and number of rooms.
 - b) Write a C-program to implement bubble sort for an array of numbers.
 - c) Find errors, if any, in the following declarations and explain why.

i. int = 314.562*150; ii. name = 'Ajay'; iii. FLOAT pi=3.1412; iv. long a=a+1;