

Reg. No. _____ Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER MCA DEGREE (REGULAR) EXAMINATION, DEC 2016**Course Code: RLMCA101****Course Name: PROBLEM SOLVING AND COMPUTER PROGRAMMING**

Max. Marks : 60

Duration : 3Hrs

PART A*Answer All Questions, Each Question Carries 3 Marks*

1. What is the purpose of a static variable in a single file program? What value of *i* will be printed at last if the function *func()* is called twice?

```
func() {  
    static int i=10;  
    printf("%d",i);  
    i++;  
}
```

2. Explain the usage of break and continue statements in C using suitable examples.
3. Write a C program to read N numbers. Compute and display sum of even numbers and product of odd numbers.
4. Explain Self referential structures.
5. Differentiate between a null pointer and a void pointer.
6. Write down the output of the following:

```
#include<stdio.h>  
main()  
{int x=10;  
int y[2], z= 5;  
int *p1=&x;  
int **p2=&p1;  
int *p3=&z;  
printf("%d", **p2);  
*(y+1) = 50;  
*y = *(y+1);
```

```
printf(“%d”, y[0]);  
printf(“The value of the expression++(*p1) - *p3:”, ++(*p1) - *p3);  
}
```

7. Describe the various file opening modes used with the fopen() function.
8. Define MACROS.

PART B

Answer any one question from each module. Each question carries 6 marks.

MODULE – I

9. a. Write an algorithm for measuring 4 litre of water if only 5 litre and 3 litre jugs are available. Also draw the flowchart for the problem. (4)
- b. What is a symbolic constant? During the compilation process, what happens to symbolic constant that appear within a C program. (2)

OR

10. What do you mean by structured programming? State the properties of structured programming

MODULE – II

11. a. Briefly mention about the various unary operators available in C. (3)
- b. Interpret the meaning of control string in the scanf functions: (3)
scanf(“%12ld %5d %6f %o”, &a, &b, &c, &d);
scanf(“ %[^\n]”, f);
scanf(“ %[ABCDEFG]”,f);

OR

12. Write a program to read a string, then encode the word on a letter by letter basis by subtracting 30 from the letter's ASCII value; display the original string, encoded string and the string length. (Use gets(), puts())

MODULE – III

13. Write a main function which implements the user defined functions that are used to interchange the largest and the smallest number in the array

OR

14. Explain Recursion. Discuss its merits. Write a C program using recursive function to find the GCD of 2 numbers

MODULE – IV

15. Write a program to define a union and a structure both having exactly the same members. Using the size of operator, print the size of the structure variable as well as the union variable and comment on the result.

OR

16. Define a structure to store the name, an array marks[] which stores the marks of three subjects and a character grade of 10 students. Write a program to display the details of the student who have secured less than 40% of aggregate. Also print the average marks of the student whose name is entered by the user.

MODULE –V

17. a. What is an array of pointers? How is it different from a pointer to an array? (3)
b. Write a program to compare two arrays using pointers. (3)

OR

18. With the help of an example, explain how pointers can be used to dynamically allocate space for 2D and 3D array.

MODULE – VI

19. Write a program to count the number of characters and number of lines in a file, whose file name should be entered through command line.

OR

20. Describe using suitable examples the three logical bitwise operators. What is the purpose of each?