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**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**B.E. I Year I-Semester (New) Examinations, December - 2015**

**Programing in C and Problem Solving**

Time: 3 hours

Max. Marks: 50

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (15 Marks)**

1. List two differences between a high level language and a machine language. [1]
2. Differentiate between break and continue statements in C. [1]
3. Write the difference between linear search and binary search. [1]
4. Given the following definitions  

```
int num[276] = {23,3,5,7,4,-1,6};
int* n = num;
```

 Find the value of the following expressions:  
 \*n + 1  
 \*(n+1) [1]
5. Write a C structure for storing the details of a college student. [1]
6. Convert the binary number 11010.01 into decimal and hexadecimal numbers. [2]
7. How would you express *for* using the *while* construct? [2]
8. Write a function that takes an array of *inches* as an argument and print the values of the Array in *centimeters*. (1 inch = 2.54 cms) [2]
9. Give the syntax and the working of the malloc function. [2]
10. Define union. Give an example and specify how many bytes are required to store the union variable. [2]

**Part-B (5 X 7 = 35 Marks)**

11. a) Draw a flowchart to calculate the BMI (Body Mass Index) of a person. BMI is defined as body mass in Kilograms divided by the height in square metres. Read the weight in Kg and height in metres and display whether the person is underweight, normal, overweight or obese. (BMI ranges less than 18.5 is underweight, 18.5 to 25 is normal, 25 to 30 is overweight and above 30 is obese.) [3]
  - b) Explain the process by which a source file in C is converted to an executable file. [4]
12. a) Write a program to compute the LCM of two natural numbers. [3]
  - b) Differentiate between call-by-value and call-by-reference methods of function calling using examples, and discuss the appropriateness of each in different situations. [4]
13. a) Write a C program that reads in two 5X5 square matrices A and B, carries out matrix multiplication, and outputs the resulting matrix AB. [3]
  - b) Explain the steps of the Bubble sort algorithm on the input 2,4,3,1,5,6. [4]

**Contd... 2**

- 14. a) Write a program that reads in two strings (of any length) and outputs '0' if they are palindromes and '1' otherwise. [3]
- b) What are the compatibility issues associated with using pointers? Explain each. How do pointers help in passing arguments to functions? [4]
- 15. a) Differentiate between text and binary files in C. Explain the syntax of the *fopen* command in C. [3]
- b) Write a program that takes as command line arguments a filename and a string, and outputs whether the string exists in the file or not. [4]
- 16. a) List the various bitwise operators in C. Give example expressions for each. [3]
- b) Write a program that takes as input a number  $n > 0$  and outputs a diamond of asterisks of width  $n$ . If  $n = 2$ , then output is as fig.1 and if  $n = 3$  output is as in fig 2. [4]

```
  *
 * *
  *
```

Fig.1

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

Fig.2

- 17. Write short notes on any *two* of the following: [7]
  - a) Recursion.
  - b) Various methods of passing an array to a function.
  - c) Differentiate between accessing the fields of a structure through a structure variable and pointer to the structure. Give examples.

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