Hall Ticket Number:

Code No. : 11005 S

VASAVI COLLEGE OF ENGINEERING (*Autonomous*), HYDERABAD
B.E. (CBCS) I-Semester Supplementary Examinations, June-2017
Computer programming and problem solving using C

Time: 3 hours   Max. Marks: 70

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

Part-A (10 × 2 = 20 Marks)

1. Convert the decimal number 53 into its binary and hexadecimal form.

2. How does the division operator (/) work with float and int variables?

3. What should be the input to get only 'abcdefghijklmnopqrstuvwxyz' to be printed out?

   ```
   char ch;
   scanf("%c",&ch);
   switch(ch)
   {
       case 'a':
           printf("the first alphabet");
       case 'b':
           printf("the second alphabet");
       default:
           printf("abcdefghijklmnopqrstuvwxyz");
   }
   ```

4. What does the following function print for n = 25?

   ```
   void fun(int n)
   {
   if (n == 0)
   return;
   printf("%d", n%2);
   fun(n/2);
   }
   ```

5. Write a function that takes a 5 x 5 array as input and prints the elements in the main diagonal.

6. Write a program that takes as input ten integers and outputs the largest integer among them.

7. What would the following program output?

   ```
   int main()
   {
           char *ptr = "Hello there";
   printf("%c\n&", *&*& *ptr);
   }
   ```

8. Define pointers in C and explain how to use the * operator (in the context of pointers).

9. Define an appropriate structure to store the medical records of a patient. It needs to have the following information: Patient name, Age (in years), Weight (this need not be an integer) and Blood pressure (a set of two integers).

10. Write the required statements to open a file and test whether it is opened else print the message "File not opened" and quit.

Part-B (5 × 10 = 50 Marks)
(All bits carry equal marks)

11. a) Describe the typical process by which a computer program is created for a particular computational task.

   b) Draw the flowchart of a computer program that takes as input three numbers and outputs the smallest and second smallest of those numbers.

12. a) Explain the different unconditional control (Jump) statements in C with examples.

   b) Write a C program that takes as input a positive integer n and uses a loop to calculate and output the sum of $1 + 2 + ... + n$.

13. a) Explain how to write macros in C using the #define directive. Demonstrate the use of macros in a C program.

   b) Write a C function that takes an integer array as input and sorts the array using selection sort.

14. a) Explain the difference between pass by value and pass by reference in C with examples.

   b) Write a program that takes as input his/her name from the user, and converts the string into uppercase without using a standard string manipulation function. Also display the name with next character in the alphabetical order for the vowels in the name. For example

   input   :- ram
   output :- RAM
                RBM

15. a) Explain the concept of nested structures. Explain how the values can be accessed in case of nested structures with the help of an example.

   b) Write a C function that returns the details of only the girl students in a class. Assume that the following details of all the students are available as an array of structures: {roll number, name, age, gender}.

16. a) Write the syntax and explain about all the standard and derived data types in C with examples.

   b) Write a program that takes an integer n as input and uses loops to output the first 10 multiples of n. For instance, if 3 is input, the program should output 3, 6, 9, 12, 15, 18, 21, 24, 27 and 30.

17. Answer any *two* of the following:
   a) Linear search in an array.
   b) Memory allocation functions in C.
   c) Enumerated types in C with example.

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