(Pages : 3) **4617**

Reg. No. : .....

Name : .....

Third Semester B.Tech. Degree Examination, September 2014
(2008 Scheme)
(Special Supplementary)
08.302 : PROBLEM SOLVING AND PROGRAMMING IN C (R, F)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions.

1. How is a compiler different from an assembler ?
2. Write briefly about program debugging.
3. List any *four* differences between primary memory and secondary memory.
4. Explain *associativity* of operators in C with a convincing example. Give an example each for left-associative and right-associative operators.
5. What is the purpose of *static* storage class in C ? Illustrate with a suitable real example.
6. Consider the following two output statements :

   printf (s) ;

   printf ("%s", s);

   If the character string ***s*** contains the string "Amar received 98% for PSPC test", the first statement will fail, whereas the second will work correctly to produce the expected output. Explain why.
7. What is the value b after execution of the following C code ? Why ?

   ```
   int a = 10, b =0 ;
   b = a++ + ++a ;
   ```
8. Illustrate parameter passing by value and by reference.

P.T.O.

9. Explain the use of command line arguments in C, with an example.

10. Write C language statements that declare and initialize a two-dimensional array as follows : – first row has *two* values ; second row has *three* values ; third row has *one* value.

PART – B

Answer **any one full** question from **each** Module.

Module – 1

11. a) Distinguish between *top-down* and *bottom-up* approaches of problem solving. Illustrate with an example.

    b) Given two positive integers x and n with $x<n$, write an efficient algorithm that finds all integers k, $x \leq k \leq n$ such that, k is divisible by x.

OR

12. a) Distinguish between high level, assembly and machine languages. Why is machine language considered the ideal language for a digital computer ?

    b) Write about the Von Neumann concept.

    c) Design an algorithm that accepts a positive, even integer n and calculates *sum* :

    $$\text{sum} = 1 + \frac{1}{x^2} + \frac{1}{x^4} + \ldots \frac{1}{x^n}$$

Module – 2

13. a) Explain, with the support of an example, how a *for* loop can be replaced by an equivalent *while* loop.

    b) Give a typical situation where the *comma* operator can be effectively used.

    c) Given the following array of integers, show the snapshots of sorting them in *descending* order using *selection sort* technique. Show the contents of the array after every data movement/interchange.

    5, 23, 4, 7, 1, 4

OR

14. a) Distinguish between *break* and *continue* statements with the support of a real example.

    b) Write a C program that computes the value of *sin (x)* using the following series, for a given angle *x* read from the input :

    $\sin(x) = x - x^3/3! + x^5/5! - x^7/7! + \ldots$

    Compute the value for the first *n* terms where the value of *n* is given as input.

Module – 3

15. a) Explain and illustrate the use of *malloc* function with an example.

    b) There are two data files F1 and F2 both having the following record format : *employee number* (integer), *name* (string). Assume that each employee has a *unique* employee number and that the records in the files are sorted according to employee number. It is found that some employee records are duplicated in F1 and F2. Write a C function that reads the files and write every unique record to a file F3. You have to include the basic *open* and *close* instructions for files, but there is no need to write the code for reading the records from input and printing records to the output.

OR

16. a) Explain and illustrate the data file operations in C.

    b) Write a C program that reads a sentence and a word and counts the number of occurrences of the word in the sentence. Assume that the words in the sentence are separated by one or more white spaces. The counting process should be implemented as a function. The counting should be done in place, that is, the original sentence should not be manipulated/ modified in any manner.