Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/M.Tech(MTT & MCP)/SEM-3/CS-301/2010-11
2010-11
PRINCIPLES OF COMPUTER PROGRAMMING

Time Allotted : 3 Hours   *Full Marks* : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer any *seven* of the following.

1. a) What do you mean by 'data' & 'information' ?   3

   b) What are the different types of programming language ?
      Explain in brief with suitable examples.   4

   c) Mention different types of data with suitable examples. 3

2. a) Define algorithm.   2

   b) Mention the sequential steps involved in writting a
      programme.   4

   c) Develop an algorithm for determining the sum of
      squares of all the odd numbers between 10 to 1000.   4

3. a) What is a function ?   2

   b) Illustrate the structural syntax of a user defined
      function in *C*-language, with a suitable example.   4

   c) What is a recursive function ? Explain with a suitable
      example.   4

4. a) What do you mean by a loop structure ?   2

   b) Illustrate the syntax and structural flow-charts of
      different loop functions commonly used in *C*-language. 8

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5. a) What is a case control structure in *C*-language ? Give an example. 4

   b) Write a programme in *C*-language to find the grace marks of a student using 'switch' operation. The user should enter the class obtained by the student and the number of subjects he has failed in. Use the following logic :

   If the student gets 1st class and the number of subjects he failed in is greater than 3, the he does not get any grace. if the number of subjects he failed in is less than or equal to 3, then the grace is of 5 marks per subject.

   If the student gets second class and the number of subjects he failed in is greater than 2, then he does not get any grace. If the number of subjects he failed in is less than or equal to 2, the grace is of 4 marks per subject.

   If the student gets 3rd class and the number of subjects failed in is greater than 1, then he does not get any grace. if the number of subjects he failed in is equal to 1, then the grace is of 5 marks per subject. 6

6. a) What do you mean by 'actual arguments' and 'formal arguments' of a function in *C*-language ? Explain with a suitable example. 4

   b) What is a pointer variable ? Briefly mention the principle of data storage and data retrieval in 'stack' in case of *C*-compilor. 4

   c) What will be the output of the following programme ?

```
#  include <stdio.h>
   void sample(int);
   void main()
   {int a = 30;
       sample (a);
       printf("\n%d",a);
   }
       void sample (int b)
   { b = 60 ;
       printf ("\n%d",b);
   }                                    2
```

7. a) Develop a programme to swap values of two variables entered by the user. 4

   b) What do you mean by recursive function ? 2

   c) Develop a programme using recursive function, to find the factorial of the number entered by the user. 4

8. a) What is an array ? Illustrate the following with example :

   i) Two-dimensional array

   ii) Array of pointers. 4

   b) Write a programme to take inputs from user for storing "End per cm" of all the fabric orders in hand, display them as output and determining the total number of orders with EPC as multiple of 24. 6

9. a) Add the missing statement for the following programme to print 35 :

```
#  include <stdio.h>
   void main()
   {int j, * ptr;
   * ptr = 35;
   printf("\n%d",j);
   }                                    1
```

b) Write a programme to pick up the largest number from any 5 row by 5 column matrix. 5

c) Write a programme to sort a set of names stored in an array in alphabetical order. 4

10. a) What do you mean by 'structure' & 'union' in the context of *C*-language ? Identify the basic differences between these two. 4

b) Create a structure to specify data on inventory details with the following parameters :

'Fabric code number', 'width', blend ratio, GSM, colour code, quantity available in metre.

Assume that there are not more than 150 fabric codes.

i) Write a function to print the fabric code numbers of all the fabrics of 100% cotton composition.

ii) Write a function to print widths of all the fabrics of GSM less than 100. 6

11. a) Illustrate the basic concept of various types of file access method available in *C*-language. 5

b) Make a comparison between basic features of *C*-language & C^{++} language. Use suitable examples to establish your statements. 5