Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/M.Tech(CSE)/SEM-2/MCSE-203/2013

2013

SOFTWARE ENGINEERING

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.

GROUP – A

1. Answer any *seven* of the following : $7 \times 2 = 14$

   i) Which life cycle model would you suggest in radiation therapy system ? Explain your views.

   ii) What do you mean by scope of control ? Explain with a diagram.

   iii) What is the difference between big-bang testing and beta testing ?

   iv) What is the advantage of ISO : 9000 over CMM with reference to S/W quality ?

   v) What is a class diagram with reference to UML ? Explain.

   vi) In case of a structure design, what is the one factor which should be avoided & why ?

   vii) What is the advantage of COCOMO-II model over COCOMO-I ? Justify your views.

   viii) What is the need to convert a DFD to a structured chart ? Explain clearly.

ix) Is there any disadvantage of a DFD ? Justify your views for or against.

x) Which one would you prefer for complex decision logic design : decision tree or decision table and why ?

GROUP – B

Answer any *four* of the following. $4 \times 14 = 56$

2. For the following *C* program, estimate all the Halstead's length and volume measures :

```
int compute_gcd ( int x, int y ) {
    while (x! = y) {
    if ( x > y ) then
          x = x - y;
    else
          y = y - x;
    }
    return x;
```

14

3. a) What advantages does complete COCOMO model offer over basic & intermediate COCOMO ? Explain clearly.

   b) The values of size in KLOC and different cost drivers for a project are given below :

   Size = 200 KLOC

   Cost driver :

   Software reliability : 1·15

   Use of software tools : 0·91

   Product complexity : 0·85

   Execution time constraint : 1·00

   Calculate the effort for embedded type of project using COCOMO model.

   c) State some disadvantages of LOC. 5 + 5 + 4

4. a) Draw the (0-level, 1-level, 2-level) DFD of an ATM transaction model.

   b) Design the data-dictionary for the DFD drawn. 9 + 5

5. A chemical plant has a number of emergency conditions. When any of the emergency condition occurs, some pre-specified actions should be taken. The different emergency conditions and the corresponding actions are as follows :

   a) If the temperature of the chemical plant exceeds T_1°C, then the water shower should be turned ON, and the heater should be turned OFF

   b) If the temperature of the chemical plant falls below T_2°C, then the heater should be turned ON, and the water shower should be turned OFF

   c) If the pressure of the chemical plant is above P_1, then the valve v_1 should be OPENED

   d) If the chemical concentration of the tank rises above *M*, and the temperature of the tank is more than T_3°C, then the water shower should be turned ON

   e) If the pressure rises above P_3, and the temperature rises above T_1°C, then the water shower should be turned ON, valves v_1 and v_2 OPENED and the alarm bell sounded.

   i) Draw a Decision Tree for the problem.

   ii) Draw a Decision Table for the problem. 7 + 7

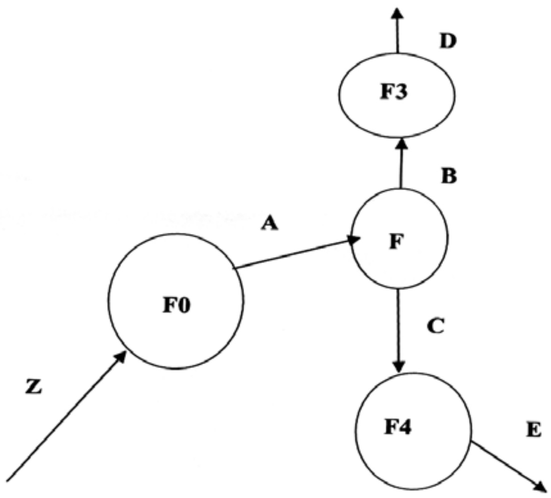
6. a) Design a black box suite for a function quadratic_solver which takes 3 floating point numbers (*a, b, c*) and computes the solution.

   b) Consider the following *C* program :

```
void sort ( int a[ ], int n ) {
int i, j;
for (i =0; i<n-1; i++)
     for (j=i+1; j<n; j++)
          if (a [i] > a[j]
          {
              temp = a [ i ];
              a [ i ] = a [ j ];
              a [ j ] = temp;
          }
```

   Draw the CFG and find out the cyclomatic complexity for the problem.

c) Differentiate between a flowchart and a CFG. 4 + 6 + 4



7. a) Identify the type of analysis used in this diagram.
   b) Convert the DFD into a structure chart. 3 + 11

8. Suppose you have the following set of activities & their activity relationships.

Activity	Duration	Predecessors
A	10	—
B	5	*A*
C	8	*B*
D	10	*A*
E	10	*C, D*
F	6	*A*
G	9	*F*
H	13	*E, G*

   a) Draw the PERT chart & find the critical path.
   b) Find the Gantt chart representation for the problem.

7 + 7

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