



Name : .....  
Roll No. : .....  
Invigilator's Signature : .....

**CS/M. Tech (CSE)/SEM-1/MCSE-105/2011-12**

**2011**

**ADVANCED 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**

Answer the following questions.

5 × 2 = 10

1. What is software quality ? What are the attributes of software quality ?
2. What is the difference between cohesion and coupling ?
3. What are different levels of testing and their goals ?
4. Differentiate between a structure chart and a flow chart.
5. What are the different types of diagrams and views supported by UML ?



**GROUP - B**

Answer any *four* of the following questions.

4 × 15 = 60

6. a) What are the differences among measure, measurement and metric ? 3
- b) What are the shortcomings of LOC ? 2
- c) Compute the function point value for a project with following information domain characteristics : 6
- |                               |   |    |
|-------------------------------|---|----|
| Number of user inputs         | : | 42 |
| Number of user outputs        | : | 70 |
| Number of user inquiries      | : | 22 |
| Number of files               | : | 09 |
| Number of external interfaces | : | 03 |
- Assume that all complexity adjustment values are complex.
- d) What do you mean by crashing of a project ? Give an example. 4
7. a) What is COCOMO estimation model ? What is the difference between COCOMO and COCOMO-II model ? 2 + 2
- b) Consider a database application project with the following characteristics :
- i) The application has 4 screens with 4 views each and 7 data tables for 3 servers and 4 clients.
  - ii) The application may generate 2 reports of 6 sections each from 7 data tables for 2 servers and 3 clients.

There is a 10% reuse of the object points. The developer's experience and capability in the similar



environment is low. The maturity of organization in terms of capability is also low.

Calculate the object point count, new object point and effort to develop such a project. 7

c) Explain Putman Resource Allocation Model. 4

8. a) The following table indicates the various tasks involved in completing a software, the corresponding activities and the estimated effort for each task in person-months :

Notation	Activity	Effort in person-month
T1	Requirement analysis	1
T2	Design	2
T3	Code actuator interface module	2
T4	Code sensor interface module	5
T5	Code user interface part	3
T6	Code control processing part	1
T7	Integrate and test	6
T8	User manual	3

The precedence relation  $T_i \leq \{ T_j, T_k \}$  implies that the task  $T_i$  must complete before either task  $T_j$  or  $T_k$  can start. The following precedence relation is known to hold among different tasks  $T_1 \leq T_2 \leq \{ T_3, T_4, T_5, T_6 \} \leq T_7$ . Draw the activity network and Gantt chart for the project.

What are the activities lie in the critical path ? 8 + 2

b) Describe SRS. What are the parameters to be treated to make a successful SRS ? 5



9. a) What is Which-Box testing ? Design the White-Box Test suite for the following code :

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

- The suite should include control flow graph, independent paths, cyclomatic complexity. 7
- b) What are the software quality assurance activities ? 4
- c) What is system testing ? How can CASE tool help the purpose of test cast generation ? 1 + 3
10. a) What are the differences among fault, failure and errors ? 2
- b) It is estimated that there will be 70 errors in a software and during testing 25 errors have been experienced. Calculate failure intensity with a given value of  $\Phi = 0.03$  using Jelinski-Moranda model. What would be the failure intensity after experiencing 50 errors ? What are cosmetic and transient errors ? 3 + 2 + 3
- c) Why is risk analysis important ? What is the difference between a 'Known' risk and 'Predictable' risk ? 2 + 3
11. Write short notes on any *three* of the following : 3 × 5
- a) Alpha testing vs Beta testing
  - b) Prototyping
  - c) Decision tree and Decision table
  - d) Waterfall Model.