



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/M.Tech(SE-IT)/SEM-1/PGSE-101/PGIT-102/2012-13  
2012**

**INTRODUCTION TO SOFTWARE ENGINEERING &  
PROJECT MANAGEMENT  
SOFTWARE ENGINEERING & CASE TOOLS**

Time Allotted : 3 Hours

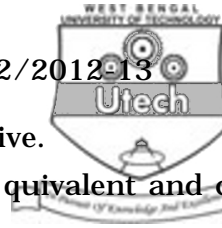
Full Marks : 70

*The figures in the margin indicate full marks.*

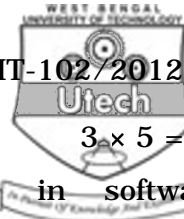
*Candidates are required to give their answers in their own words  
as far as practicable.*

Answer the following questions.

1. Answer any *ten* of the following questions :  $10 \times 1 = 10$ 
  - i) Software organizations achieve efficient manpower utilization by adopting a project based organization structure.
  - ii) The democratic team organization is very well suited to handle complex and challenging projects.
  - iii) When a task along a critical path is completed in less time than originally estimated, it should result in faster completion of the project.
  - iv) Size of a project, as used in COCOMO is the size of the final executable code in bytes.
  - v) User interface issues of a system are usually its functional requirements.
  - vi) A precise specification cannot be incomplete.
  - vii) Inheritance feature of the object oriented paradigm helps in code reuse.



- viii) Aggregation relationship can be reflexive.
  - ix) The terms method and operation are equivalent and can be used interchangeably.
  - x) During code review you detect errors, whereas during code testing you detect failures.
  - xi) The effectiveness of a test suite in detecting errors in a system can be determined by counting the number of test cases in the suite.
  - xii) Test stubs are simpler to write as compared to test drivers.
  - xiii) The reliability of a software product increases almost linearly, each time a defect gets detected and fixed.
2. Answer any *five* of the following questions :  $5 \times 3 = 15$
- a) You have been asked to lead a five-person software development team that will implement a small but safety critical software package. Which software process would you select and why ?
  - b) Give example of following terms in context of a program/software :
    - i) fault
    - ii) error
    - iii) failure.
  - c) What is risk leverage ? What is its significance in selection of an appropriate risk reduction technique ?
  - d) What do you understand by "MTBF of a system is 200 hours" ? How MTTF is related to maintainability of a system ?
  - e) What do you understand if we say "a program is fault-free with a 95 percent level of confidence".
  - f) For each type of coupling ( any three ), give example of two components coupled in that way.



3. Answer any *three* of the following questions :

3 × 5 = 15

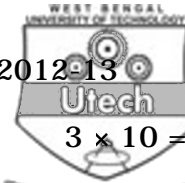
- What is the significance of SRS in software development process ? Take a software system of your choice and list 3 functional and 3 non-functional requirements.
- A software company wants to develop a compiler for a new programming language. Estimated size of the product is 400,000 lines of code. Compute the effort and the development time. If salary of a programmer per month is Rs. 40,000, then what would be total development cost of the project ?
- A library in an academic institution has four categories of members : faculty, staff, UG students, PG students. A book is either a reference book or a text book. The following rule is followed for issuing a book. Only text books can be issued out. A faculty can issue up to 8 books for upto 6 months. A staff can issue 6 books for upto 4 months. A PG student can issue upto 5 books for 2 months. UG students can issue 4 books upto 1 month.

Represent this requirement using decision tree/table which one you think suitable more.

- Tasks of a project and their dependencies are given below :

| <b>Tasks</b> | <b>Days</b> | <b>Dependence</b> |
|--------------|-------------|-------------------|
| T1           | 15          | —                 |
| T2           | 10          | T1                |
| T3           | 12          | T2                |
| T4           | 25          | T1                |
| T5           | 10          | T3, T4            |

Draw WBS, identify critical path and tasks. Find slack time of task T4.



3 × 10 = 30

4. Answer the following questions :

- a) Write a C function to search an integer value from a sorted array of size 100 using binary search method. Then draw control flow graph and find cyclomatic complexity. Design a test suite for testing your binary search function.
- b) What do you understand by the term integration testing ? Which types of defects are uncovered during integration testing ? What are the different types of integrating testing methods that can be used to carry out integration testing of a software product. Describe all the methods taking a number modules of a software. Compare the merits and demerits of these different integration testing strategies.
- c) What are the key factors that have changed software programming to software development ? Which process model/s give you the most flexibility to change in reaction to changing requirements ? Should a development organization adopt a single process model for all of its software development ? What is 'software crisis' ? What do you mean by agile development process ?

=====