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 × 1 = 10

   i) Software organizations achieve efficient manpower utilization by adopting a porject based organization structrue.

   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 quivalent 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 alomost linearly, each time a defect gets detected and fixed.

2. Answer any *five* of the following questions : 5 × 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

a) 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.

b) 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 whould be total development cost of the project ?

c) 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 iuused 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.

d) Tasks of a project and their dependencies are given below :

Tasks	***Days***	***Dependence***
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.

4. Answer the following questions : 3 × 10 = 30

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 ?