Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/MCA/SEM-4/MCA-401/2011

2011

SOFTWARE ENGINEERING AND TQM

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

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

   i) You are auditing current customer practices potentially amenable to software application(s). Which two should be part of the audit ? (Choose *two*)

      a) Identification of current logical system(s)

      b) Identification of current virtual system(s)

      c) Identification of current physical system(s)

      d) Identification of current corporate strategies.

   ii) What are three parts of feasibility analysis ? (Choose *three*)

      a) Legal feasibility b) Political feasibility

      c) Technical feasibility d) Economic feasibility.

iii) Project schedulers are often based on programmer productivity on past projects as measured in terms of size unit per time unit (such as lines of code per day). Which two must be considered when developing project schedules using this approach ? (Choose *two*)

a) Time schedule

b) Similarity of projects

c) Expertise of programmers

d) Complexity of programming language.

iv) Which two factors must be considered when developing acceptance criteria ? (Choose *three*)

a) User availability

b) Match with requirements

c) Ability to bench mark system

d) Schedule of system delivery.

v) A corporation uses formal methods for requirement specification because they believe that it guarantees that the customer's needs will be met by the new software application. Which statement about this corporation's belief is true ?

a) Formal methods do provide this guarantee because they are safer to use

b) Formal methods do not provide this guarantee because they are not testable

c) Formal methods do provide this guarantee because they are based on mathematical techniques for which proof systems exist

d) Formal methods do not provide this guarantee because they are difficult to communicate accurately to the user.

vi) A data dictionary was created during the requirement analysis phase of a software engineering project. What information does it contain ? (Choose *three*)

a) Interface b) Data type

c) Restrictions d) Content description.

vii) What is configuration management in software engineering ?

a) Overall management of the design of the system

b) Management of the configurable components in a system

c) The identification of the configuration of a system at discrete points in time to control changes to the configuration

d) In object-oriented programming the management of objects that control the configuration of some other function(s) in the system.

viii) Which statement about the preliminary design state of a software development project is true ?

a) The preliminary design is an internal document used only by programmers

b) The preliminary design is the result of mapping product requirements into software and hardware functions

c) The preliminary design of the product comes from the initial meetings between the customer and the programmer

d) The developers produce the preliminary design by defining the software structure in enough detail to permit coding.

ix) What is functional decomposition in software system design ?

a) A design method that breaks a system into smaller units

b) A requirement analysis method that breaks the system into cohesive and related units

c) A design methodology that uses modular prototypes to build the complete system

d) The ability to upgrade the features of particular module of a system with minimal impact on other modules.

x) A software project classifies system entities, their activities and relationships. The classification and abstraction of system entities are important. Which modelling methodology most clearly shows the classification and abstraction of entities in the system ?

a) Data flow model

b) Even driven model

c) Object oriented model

d) Entity-relationship model.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. What is UML ? What are the different types of diagrams and views supported by UML ?

3. A software uses 20 unique operators and its vocabulary is 200. Find the effort and time for project.

4. What is the difference between cohesion and coupling ? What are the different types of coupling that may exist between two modules ? 3 + 2

5. What is software quality ? What are the attributes of software quality ? 2 + 3

6. Explain how a software development effort is initiated and terminated in spiral model.

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) What are the differences among measure, measurement and metric ?

   b) What are the differences between LOC and FP ?

   c) Consider a project which the following functional units :

   No. of inputs = 10, No. of outputs = 5, No. of external queries = 6, No. of input files = 9, No. of external interface files = 16 and degree of influence = 49. Taking all these functional units as average, find the function point of the project.

8. a) What is COCOMO estimation model ? What is the basic 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 two reports of 6 section 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

9. Write down different programming analysis tools. State different debugging approaches. What are the differences between verification and validation in terms of development of software ? State "boundary value analysis" with example. 4 + 3 + 4 + 4

10. 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-months
T1	Requirements 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 $T_i <= \{T_j, T_k\}$ 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 $T_1 <= T_2 <= \{T_3, T_4, T_5, T_6\} <= T_7$. Draw the activity network and Gantt chart representations for the project. 7

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

c) Differentiate between UML and class diagram in software project development. 3

11. Write short notes on any *three* of the following : 3×5

a) Alpha testing *vs* Beta testing

b) Prototyping

c) Gantt charts

d) Cyclomatic complexity

e) Waterfall model.