ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009

SOFTWARE ENGINEERING

SEMESTER - 6

Time : 3 Hours] [Full Marks : 70

GROUP – A

(Multiple Choice Type Questions)

1. Choose the most appropriate alternative for any *ten* of the following : 10 × 1 = 10

i) Which is not the part of a feasibility analysis ?

a) Legal feasibility b) Political feasibility

c) Technical feasibility d) Economic feasibility. ☐

ii) Which are included in the software requirements specification ?

Also option b and d???

a) Error handling b) Data description

c) Functional description d) Performance description. ☐

iii) 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) is the system. ☐

iv) A software project classifies system entities, their activities and relationships. The classification and abstraction of system entities is important.

Which modeling methodology most clearly shows the classification and abstraction of entities in the system ?

a) Data flow model b) Event driven model

c) Object oriented model d) Entity-relationship model. ☐

v) Which statement about a prototype is true ?

a) It is a functional model of the entire system.

b) It is the complete untested product ready for final review by the customer.

c) It is necessary in order to accurately verify that the product is progressing in accordance with requirements specifications.

d) It is a full-scale model of the entire system at some partial stage in development showing the functional form of the system. ☐

vi) How is an application's "version" different from its "release" ?

a) A release is a small change to an earlier release

b) A version is a small change made to an earlier version

c) A version is the one made available to customers and a release is a change

d) A release is the one made available to customers and a version is a change to a previous release. ☐

vii) To achieve a good design, modules should have

a) Weak cohesion & Low coupling

b) Weak cohesion & High coupling

c) Strong cohesion & Low coupling

d) Strong cohesion & High coupling. ☐

viii) Barry Boehm has proposed

a) Waterfall Model b) V Model

c) Spiral Model d) Prototype Model. ☐

ix) If the project size is same then development time is maximum in case of

a) Embedded b) Semi-detached

c) Organic d) Impossible to determine. ☐

x) According to COCOMO no. of cost drivers is

a) 10 b) 15

c) 20 d) 14. ☐

xi) The best type of ~~coupling~~ cohesion is

a) Coincidental b) Logical

c) Informational d) Functional. ☐

GROUP – B
(Short Answer Type Questions)

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

2. What is coupling ? What are the factors affecting coupling ? What is relationship between coupling and cohesion ? 1 + 2 + 2

3. What is formal technical review (FTR) ? What are the differences between fault, failure and error ? $2\frac{1}{2} + 2\frac{1}{2}$

4. There are 50 errors estimated to be present in a program. We have experienced 30 errors. Use Jeleski-Moranda model to calculate the failure intensity with a given value of $\Phi = 0.03$. What will be the failure intensity after experience of 40 errors ?

5. Which life cycle model do you follow for developing software for each of the following applications ? Justify your selection of model with the help of an appropriate reason :

a) A Game

b) A Compiler for a new language. $2\frac{1}{2} + 2\frac{1}{2}$

6. What is "test oracle" ? As the manager of a software project to develop a product for business application, if you estimate the effort required for completion of the project to be 50 person-months, can you complete the project by employing 50 engineers for a period of one month ? Justify your answer. 3 + 2

7. a) Explain the term "blocking state".

b) Explain the format of data dictionary. 2 + 3

GROUP – C

(Long Answer Type Questions)

Answer any *three* questions. $3 \times 15 = 45$

8. A program is expected to have 50 faults. It is also assumed that one fault may lead to one failure only. The initial failure was 2 failures/CPU Hr. The program was to be released with a failure intensity objective of 5 failures / 100 CPU Hr. Calculate the number of failures before release. What is the difference between function oriented design and object oriented design ? 10 + 5

9. What is reliability ? Define ROCOF, POFOD, MTTF, and MTTR. What is cyclometic complexity ? Write a C program to calculate GCD of two numbers and calculate the cyclometic complexity of the pgrogram. 2 + 8 + 1 + 4

10. a) Draw the context diagram and Level 1 DFD for the following Mail Order Processing System.

"HMV Records is a mail-order company that distributes CDs and tapes at discount prices to record club members. When an order processing clerk receives an order form, he or she verifies that the sender is a club member by checking the Member file. If the sender is not a member, the clerk returns the order along with a membership application form. If the customer is a member, the clerk verifies the order item data by checking the Item file. Then the clerk enters the order data and saves it to the Daily Order file. The clerk also prints an invoice and shipping list for each order, which are forwarded to Order Fulfilment."

b) Explain when you use the PERT charts and when to use Gnatt charts, if you were to perform the duties of a project manager.

c) How are the concepts of Cohesion and Coupling useful in arriving at good software design ? 7 + 2 + 6

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

Notation	*Activity*	*Effort in person-months*
T_1	Requirements Specification	1
T_2	Design	2
T_3	Code actuator interface module	2
T_4	Code sensor interface module	5
T_5	Code user interface part	3
T_6	Code control processing part	1
T_7	Integrate and test	6
T_8	Write 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 task's $T_1 \leq T_2 \leq \{T_3, T_4, T_5, T_6\} \leq T_7$. Draw the Activity Network and the Gantt chart representations for the project.

b) Eplain why the spiral life cycle model is considered to be a meta model.

c) Describe your parts as a system analyst.

d) Explain the disadvantages of prototype model. 5 + 2 + 5 + 3

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

a) Spiral model

b) UML diagrams

c) Incremental model of software development

d) Integration & Load testing

e) Decision tree and Decision table.

END