ALCCS – OLD SCHEME

Code: CS44   **Subject: SOFTWARE ENGINEERING**
Time: 3 Hours   **Max. Marks: 100**

AUGUST 2011

NOTE:
- **Please write your Roll No. at the space provided on each page immediately after receiving the Question Paper.**
- **Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.**
- **Parts of a question should be answered at the same place.**
- **All calculations should be up to three places of decimals.**

Q.1   a. Differentiate between evolutionary and throw-away prototyping.

   b. Why Spiral model is considered as a meta model? Explain.

   c. Differentiate between functional and non functional requirements of a software?

   d. Define the term cohesion in the context of object-oriented design.

   e. Describe in brief four basic principles of software engineering.

   f. Differentiate between software reengineering and reverse engineering.

   g. Explain Equivalence Class Partitioning and Boundary value analysis techniques for software testing.   **(7 × 4)**

Q.2   a. Discuss the differences between Structured Analysis and Object Oriented Analysis.   **(10)**

   b. Mention the problems that might be faced by an organization if it does not follow any software life cycle model.   **(4)**

   c. Verify the statement "Spiral model is not suitable for products that are vulnerable to large number of risks".   **(4)**

Q.3   a. What is the aim of requirements analysis and specification phase of software development? Discuss various activities undertaken during this phase.   **(9)**

   b. What is a decision table? Make a decision table for a Library Management System (LMS) that support three options:
   (i)   When the *'new member'* option is selected, the software asks details about the member like the member's name, address, phone number etc. If proper information is

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entered then a membership record for the member is created and a bill is printed for the annual membership charge plus the security deposit payable.

(ii)   If the '*renewal*' option is chosen, the LMS asks for the member's name and his membership number to check whether he is a valid member or not. If the membership is valid then membership expiry date is updated and the annual membership bill is printed, otherwise an error message is displayed.

(iii)   If the *'cancel membership*' option is selected, then the software asks for member's name and his membership number. The membership is cancelled, a cheque for the balance amount due to the member is printed and finally the membership record is deleted from the database.   **(9)**

Q.4   a. Discuss Walkthroughs and Inspections as Software Review Techniques.   **(6)**

b. State when a module can be called functionally independent of other modules. Why functional independence is the key factor for a good software design?   **(6)**

c. Differentiate between cohesion and coupling. Mention the different types of coupling and cohesion in modules.   **(6)**

Q.5   a. Design a black-box test suite for a program that computes the intersection point of two straight lines and displays the result as "Parallel lines"/ "Intersecting lines"/ "Coincident lines". It reads two integer pairs $(m1, c1)$ and $(m2, c2)$ defining the two straight lines of the form $y = mx + c$. The lines are Parallel if $m1 = m2$, $c1 \neq c2$; Intersecting if $m1 \neq m2$; and Coincident if $m1 = m2$, $c1 = c2$.   **(6)**

b. Discuss Mutation Testing. What is the purpose of performing mutation testing?   **(6)**

c. Explain why software debugging is needed. Explain various approaches for debugging softwares.   **(6)**

Q.6   a. Assume that the size of an organic type software product has been estimated to be 32,000 lines of source code and the average salary of software engineers be Rs. 15,000/- per month. Determine the effort required to develop the software product and the nominal development time.   **(6)**

b. Mention any five metrics for computing Software Reliability.   **(6)**

c. What is meant by Empirical Estimation Techniques? Write down the major differences between expert judgment technique and delphi cost estimation technique.   **(6)**

Q.7   Write short notes on any **THREE** of the following:-
(i)   PERT and CPM.
(ii)   Unit, Integration and System Testing.
(iii) COCOMO.
(iv) Validation Testing for Product and Custom Software.   **(6+6+6)**