SPRING END SEMESTER EXAMINATION-2016

SOFTWARE ENGINEERING

(MCA - 401)

(Regular – 2014 Admitted batch & Back)

Time: 3 Hours **Full Marks: 60**

*Answer **any six** questions including question No.1 which is compulsory.*
The Figures in the right hand margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.

1. a) What are the goals of RAD model? [2×10]

   b) Give an example of non-functional requirement.

   c) What do you mean by "fan-in" and "fan-out" of a module?

   d) What do you mean by structured chart?

   e) State the significance of UML diagram. Mention the different types of diagram it constitutes off.

   f) Differentiate between Code Walkthrough and Code Inspection.

   g) What are the approaches to integration testing of object-oriented programs?

   h) What do you understand by Reverse Engineering?

   i) What are the different categories of software development projects according to the COCOMO estimation model?

   j) What is Six-sigma and what is the requirement to achieve it?

2. a) Write down the roles and responsibilities of a system analyst. [4]

b) Provide a brief comparison between the different life cycle models. [4]

3. Read the following **Motor Part Shop Software (MPSS).**

The motor parts shop deals with large number of motor parts of various manufacturers and various vehicle types. Some of the motor parts are very small and some are of reasonably large size. The shop owner maintains different parts in wall mounted and numbered racks.
The shop owner maintains as few inventory for each item as reasonable, to reduce inventory overheads after being inspired by the just-in-time (JIT) philosophy.

Thus, one important problem the shop owner faces is to be able to order items as soon as the number of items in the inventory reduces below a threshold value. The shop owner wants to maintain parts to be able to sustain selling for about one week. To calculate the threshold value for each item, the software must be able to calculate the average number of parts sales for one week for each part.

At the end of each day, the shop owner would request the computer to generate the items to be ordered. The computer should print out the part number, the amount required and address of the vendor supplying the part.

The computer should also generate the revenue for each day and at the end of the month, the computer should generate a graph showing the sales for each day of the month.

For the motor parts shop software (MPSS)

a) Prepare the SRS. [1]

b) Design the context diagram, level-1 DFD and level-2 DFD. [3]

c) Develop the activity diagram, usecase diagram, sequence diagram & class diagram. [4]

4. a) How is cohesion different from coupling? Mention the cohesion spectrum to reveal its significance. [4]

b) Explain the various software development Methodologies. Does it really affect the development of software in the industrial applications? Justify your answer with a relevant example. [4]

5. a) Consider a software project with 5 tasks T1-T5. Duration of the 5 tasks (in weeks) are 3,2,3,5,2 respectively. T2 and T4 can start when T1 is complete. T3 can start when T2 is complete. T5 can start when both T3 and T4 are complete. Draw the PERT chat representation of this project. When is the latest start date of the task T3? What is the slack time of the task T4? Which tasks are on the critical Path? [4]

b) What do you mean by software reliability? With suitable examples, briefly explain the different reliability metrics for software products. [4]

6. a) Design a black box test suite for a program that accepts a pair of points defining a straight line and another point and a real number defining the center of a circle and its radius. The program is intended to compute their point of intersection and prints them. [4]

b) Assume that, there are 100 integers stored in an array of size 100. Using linear search method to obtain any one of the element, perform the following:- [2+2]

i) Construct the Control Flow graph (CFG).

ii) Determine the cyclomatic complexity using the constructed CFG.

7. a) What are the different types of software maintenance? With a suitable diagram, briefly explain a maintenance process model. [4]

b) What do you mean by Computer Aided Software Engineering (CASE) tool? With a suitable diagram, briefly explain the CASE environment architecture. [4]

8. Write short notes on **any two**. [4+4]

a) Agile model development

b) Coding standards

c) Risk management

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