— 409 —

SIXTH SEMESTER
B. Tech.
End Semester Examination
May- 2019

MC-310 Software Engineering

Time: 3 Hours
Max. Marks: 50

Note: Attempt any five questions. All questions carry equal marks.

(1) (a) Explain the prototype model of software development. Mention its advantages and disadvantages. Give an example of software project that would be amenable to the prototyping model.

(b) Describe the various applications of software.

(2) (a) Discuss the importance of software requirements specification. Choose any piece of software which you use regularly. Briefly describe the requirements that the software meets for you as the user. Suggest two ways in which the software could be improved for you.

(b) What are the characteristics of a good design? Describe different types of coupling and cohesion.

(3) (a) Explain the SEI Capability Maturity Model (CMM). Why is it suggested that CMM is a better choice than ISO-9001?

(b) Describe separation of concerns. Is there a case when a 'divide and conquer' strategy may not be appropriate? How might such a case affect the argument for modularity?

(4) (a) Discuss reverse engineering and re-engineering.

(b) Consider a project to develop a full-screen editor. The major components identified are: (1) screen edit, (2) command language interpreter, (3) file input and output, (4) cursor movement, and (5) screen movement. The sizes for these are estimated to be 4K, 2K, 1K, 2K, and 3K delivered source code lines.
Use the COCOMO model to determine

(i) overall effort and schedule estimates (assume values for different cost drivers, with at least three of them being different from 1.0) and

(ii) effort and schedule estimates for different phases.

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(5) (a) What is software quality? Discuss software quality attributes.

(b) Assume that a program will experience 100 failures in infinite time. It has now experienced 50. The initial failure intensity was 10 failures/CPU hr.

(i) Determine the current failure intensity.

(ii) Find the decrement of failure intensity per failure.

(iii) Calculate the failures experienced and failure intensity after 10 and 50 CPU hrs. of execution.

(iv) Compute additional failures and additional execution time required to reach the failure intensity objective of 2 failures/CPU hr.

Use the basic execution time model of software reliability for the calculations.

(6) (a) Why do we need metrics in software? Discuss the areas of applications of software metrics. State the advantages and disadvantages of using LOC as a metric.

(b) What is software maintenance? Describe various categories of maintenance. Which category consumes maximum effort and why?

(7) (a) What are the different levels of testing and the goals of the different levels? For each level, specify which of the testing approaches is most suitable.

(b) Write a brief note on current trends in Indian software industry. State three key challenges facing software engineering? Give examples (both positive and negative) that indicate the impact of software on our society.

End