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TCS–611

B. TECH. (CSE) (SIXTH SEMESTER)
END SEMESTER
EXAMINATION, June, 2023

SOFTWARE ENGINEERING

Time : Three Hours

Maximum Marks : 100

Note : (i) All questions are compulsory.

(ii) Answer any *two* sub-questions among (a), (b) and (c) in each main question.

(iii) Total marks in each main question are **twenty**.

(iv) Each sub-question carries 10 marks.

1. (a) List the task regions in the spiral model. (CO1)

(b) Explain Waterfall model. What are the problems that are sometimes encountered when the Waterfall model is applied ? (CO1)

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(c) What are the major differences between system engineering and software engineering ? (CO1)

2. (a) Draw the context level DFD for the safe home software. (CO2)

(b) Draw an ER and DFD diagram for university information system. (CO2)

(c) Describe the decision tree technique for requirements gathering. Discuss its advantages and limitations. (CO2)

3. (a) Explain object-oriented design principles and their importance in software development. Discuss the top-down and bottom-up approaches in object-oriented design. (CO3)

(b) Explain Halestead's Software Science and how it is used to measure software complexity. Discuss the key metrics involved in Halestead's Software Science. (CO3)

(c) What factors should be considered when selecting a programming language for software development ? Discuss the

criteria for choosing a programming language based on project requirements and constraints. (CO3)

4. (a) Compare and contrast top-down and bottom-up testing strategies. Explain the roles of test drivers and test stubs in these strategies. (CO4)

   (b) What are alpha and beta testing ? Explain their purpose and the stages at which they are conducted ? Discuss the differences between these two types of testing. (CO4)

   (c) Explain the walkthrough and code inspection techniques used in static testing. Discuss the benefits of conducting these activities during the software development process. (CO4)

5. (a) Explain the concept of software maintenance and its importance in the software development life cycle. Discuss the different categories of maintenance: preventive, corrective, and perfective. (CO5)

(b) Discuss the role of CASE (Computer-Aided Software Engineering) tools in software project management. Explain how CASE tools can improve productivity and support the software development process. (CO5)

(c) Explain the SEI-CMM (Software Engineering Institute-Capability Maturity Model) and its significance in assessing and improving software development processes. (CO5)