End Term (Even) Semester Examination May-June 2025

Roll no. 22⁹⁴10³ℓ

Name of the Program and semester: **B. Tech**
Name of the Course: **Software Engineering**
Course Code: **TCS-611**

Time: 3-hour   Maximum Marks: 100

Note:
- *(i)* All the questions are compulsory.
- *(ii)* Answer any two sub questions from a, b and c in each main question.
- *(iii)* The total mark for each question is 20 (twenty).
- *(iv)* Each sub-question carries 10 marks.

Q1. (2X10=20 Marks)

a. Explain Brooks' "No Silver Bullet" argument. What are the essential and accidental difficulties of software development as described by Brooks? How do these impact modern software engineering?
CO1

b. Describe the non-traditional software development processes including Rational Unified Process (RUP), Rapid Application Development (RAD), and Agile Development. How do these strategies vary from conventional models, and what advantages do they offer in modern software applications?
CO3

c. Define Software Engineering with its historical development. What were the major issues that led to the Software Crisis, and how did they influence the evolution of software engineering as a discipline?
CO1

Q2. (2X10=20 Marks)

a. Elaborate the sub-phases of requirement analysis. How do functional and non-functional requirements influence the overall quality and performance of a software?   CO2

b. What is a Software Requirements Specification (SRS)? Discuss its structure, purpose, and its role in ensuring requirement clarity and consistency.   CO2

c. Discuss the common limitations to eliciting user requirements. How can these challenges be addressed to ensure accurate and complete requirement gathering?   CO2

Q3. (2X10=20 Marks)

a. Explain data driven software design. How does it differ from other design paradigms, and what are the potential benefits and drawbacks of using this approach?   CO4

b. Draw the control flow graph (CFG) for the above function and calculate its cyclomatic complexity using McCabe's method.   CO6

```
def check_number(num):
    if num > 0:
        print("Positive")
    elif num == 0:
        print("Zero")
    else:
        print("Negative")

    if num % 2 == 0:
        print("Even")
    else:
        print("Odd")
```

c. Describe the top-down and bottom-up approaches of software design. In which situations do each approach more appropriate? Provide examples.   CO4

Q4. (2X10=20 Marks)

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a. Compare and contrast top-down and bottom-up integration testing strategies. What roles do test drivers and test stubs play in each approach? CO6

b. What are alpha and beta testing? Describe their significance in the software release cycle and explain how user feedback during these stages contributes to product improvement. CO6

c. Differentiate between functional testing & structural testing. How are black box & white box testing methods applied in software quality assurance (SQA)? CO6

Q5. (2X10=20 Marks)

a. What is the significance of software re-engineering and reverse engineering in software maintenance. How do these processes contribute to extending software life and reducing maintenance costs? CO5

b. Describe the key activities involved in Software Configuration Management (SCM). How does the change control process and version control support effective SCM in software projects? CO5

c. Discuss about SQA? Describe the components of an SQA plan & compare the ISO 9000 and SEI-CMM models in the context of ensuring software quality. CO6