

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

School of Computing Science and Engineering

Master of Technology in Computer Science and Engineering

Mid Term Examination - Nov 2023

Duration : 90 Minutes

Max Marks : 50

Sem I - E2PV104T - Advanced Software Engineering

General Instructions

Answer to the specific question asked

Draw neat, labelled diagrams wherever necessary

Approved data hand books are allowed subject to verification by the Invigilator

- 1) Consider a software project where the system must support a certain number of transactions per second. The requirement states that the system should be capable of handling at least 100 transactions per second. Use a formal specification approach to represent this requirement numerically. K3 (6)

- 2) Discuss the Prototype Model in software development. Explain the key features, phases, and advantages of the Prototype Model. Provide a detailed description of each phase in the Prototype Model and illustrate its application with an example scenario. Finally, highlight the benefits that make the Prototype Model suitable for certain types of projects. K3 (9)

- 3) Consider a software development project that follows the Waterfall model. The project is estimated to have the following durations for each phase of the Software Development Life Cycle (SDLC):
Requirements Analysis: 4 weeks
System Design: 6 weeks
Implementation: 8 weeks
Testing: 5 weeks
Deployment: 2 weeks
Maintenance: Ongoing
Calculate the total duration of the project, and identify the critical path. Assume that each phase must be completed sequentially. K4 (8)

- 4) Consider a software development project with specific requirements and constraints. The project manager is evaluating different Software Development Life Cycle (SDLC) models to determine the most suitable approach. The project requirements are as follows:
- Requirements Analysis: 4 weeks
 - System Design: 6 weeks
 - Implementation: 8 weeks
 - Testing: 5 weeks
 - Deployment: 2 weeks
 - Maintenance: Ongoing
- The project is subject to the following constraints:
- The project must be delivered within 25 weeks.
 - There is a high priority on early delivery to meet urgent business needs.
 - Changes to requirements during the development process should be minimized.
- Evaluate and provide solutions for the following:
- Waterfall Model:**
Determine if the Waterfall model is feasible for the project, considering the time constraint and emphasis on early delivery.
If not feasible, provide a brief explanation.
 - Iterative Model:**
Propose an Iterative model and provide a schedule breakdown for two iterations. Include the phases and durations for each iteration.
Discuss the advantages of using an Iterative model in this scenario.
 - Agile Model:**
Propose an Agile model (e.g., Scrum or Kanban) and provide a high-level overview of the iterative development cycles (sprints or iterations).
Explain how Agile addresses the requirements for early delivery and adaptability to changes.

- 5) Consider a software development project with the following characteristics:
- Size of the project: 50,000 lines of code
 - Cost driver attributes (scale factors):
 - Precedentedness: Very Low
 - Development Flexibility: Very High
 - Architecture/Risk Resolution: High
 - Team Cohesion: Very Low
 - Process Maturity: Nominal
 - Effort Adjustment Factor (EAF): 1.2
- Assuming a nominal value of 2.4 for the Basic COCOMO effort equation ($\text{Effort} = a * (\text{Size})^b$), where 'a' and 'b' are constants, calculate the estimated effort required for the project.