SET B Design and Analysis of Software Systems 30/01/2025
Quiz - I

Name: [redacted] Roll No [redacted]

This is a closed-book, closed-notes Quiz. Answer all questions for a maximum score of **30 points**. The total time for the Quiz is **45 min**.
Credit is given for what you write, not what you are thinking. Write your answer in the space provided for the question. Partial credit will be given based on content, not quantity.

Good Luck!

Multiple choice questions (10 * 1 = 10 points)

1. **Which statement about the Spiral Model is incorrect?**
   A. It incorporates risk analysis as a fundamental part of its development process.
   B. It is particularly useful for large and complex projects with high-risk factors.
   C. It combines elements of both iterative and incremental development.
   D. It requires a fixed set of phases that must be completed in order.

   ANSWER: D

2. **In which scenario would a Prototyping Model be preferred over a Waterfall Model?**
   A. When the requirements are well understood and unlikely to change.
   B. When the project involves multiple stakeholders with conflicting needs.
   C. When strict adherence to documentation and process is required.
   D. When there is uncertainty in user requirements and frequent feedback is essential.

   ANSWER: B, D

   D

3. **What is the primary limitation of using the Incremental Model in software development?**
   A. It requires customers to be involved continuously throughout the development process.
   B. It can lead to incomplete documentation if not properly managed.
   C. It does not support the use of automated testing tools effectively.
   D. It fails to accommodate changes after the initial requirements are established.

   ANSWER: D

   B

4. **What is the primary difference between the waterfall model and the evolutionary model?**
   A. The evolutionary model breaks product development into a series of releases.
   B. The evolutionary model allows you to change the sequencing and content of phases and activities as the project proceeds.
   C. The evolutionary model includes the concept of assessing risk and making go/no-go decisions.
   D. The evolutionary model allows you to go back to earlier phases to make improvements to previously generated documents and code deliverables.

   ANSWER: A, D

   A

5. **In the Agile SDLC model, what is the primary emphasis?**
   A. A strict and inflexible project schedule
   B. Extensive documentation and planning
   C. Continuous collaboration with customers and responding to change
   D. Completing all development work upfront before any testing begins

   ANSWER: C

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Quiz - 1

6. **In the Incremental Iterative Model, how are user requirements typically managed throughout the development process?**
   A. All user requirements are defined at the beginning and must remain unchanged until the project is complete. X
   B. User requirements are continuously gathered, evaluated, and incorporated based on feedback received after each iteration. ✓
   C. User requirements are rarely revisited, focusing instead on completing the project with minimal revisions. X
   D. User requirements are documented in a single extensive document and not updated throughout the project. X

   ANSWER: B.

7. **In a project using the Critical Path Method (CPM), an activity has the following attributes: Early Start (ES) = 4 days, Duration = 6 days, Late Finish (LF) = 12 days. What is the Late Start (LS) for this activity, and what does this indicate about the activity's float?**
   A. LS = 8 days; the activity has 4 days of float.
   B. LS = 6 days; the activity has 0 days of float.
   C. LS = 12 days; the activity has no flexibility in scheduling.
   D. LS = 10 days; the activity has 2 days of float.

   ANSWER: B

8. Which of the following strategies is NOT primarily addressing the problems of concurrent development in a team environment?
   A. Strong focus on requirements elicitation and understanding of customer needs X
   B. Effective configuration management procedures and tool use
   C. Good modular design with well-defined interfaces
   D. A clear integration strategy with good unit and integration testing

   ANSWER: B

A

9. **In the context of software effort estimation, which of the following statements best describes the "cone of uncertainty"?**
   A. It suggests that as a project progresses, the estimation accuracy decreases significantly due to evolving requirements. X
   B. It indicates that the initial estimation should always be considered the final benchmark for project budgeting. X
   C. It emphasizes that the accuracy of project estimates improves as information becomes available over time. ✓
   D. It illustrates that all estimation techniques yield approximately the same level of accuracy regardless of project complexity. X

   ANSWER: C

10. **When employing the Wideband Delphi technique for software estimation, what is the primary role of the facilitator?**
    A. Provide expert opinions on estimation values to the group.
    B. Ensure that all estimates are averaged into a single value for decision-making.
    C. Prepare the estimation report based solely on the individual estimates submitted by team members. X
    D. Guide the team through the estimation process while managing group dynamics and ensuring all voices are heard. ✓

    ANSWER: D

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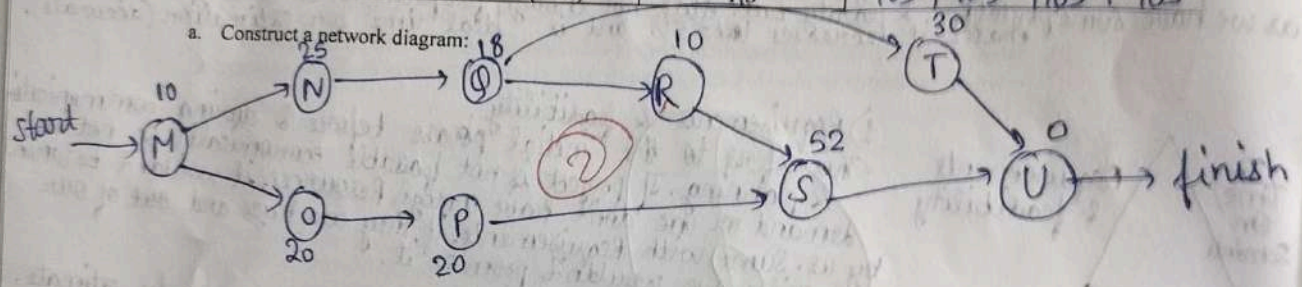
14. **For the task table given below, perform the following (6 points):**

Task Identifier	Estimated Hours	Task Predecessors	ES	EF	LS	LF
M	10	None (start)	0	10	0	10
N	25	M	10	35	10	35
O	20	M	10	30	23	43
P	20	O	30	50	43	63
Q	18	N	35	53	35	53
R	10	Q	53	63	53	63
S	52	P,R	63	105	63	105
T	30	Q	53	83	75	105
U	0 (done)	T,S	105	105	105	105

a. Construct a network diagram:



b. Identify the critical task path: Path with slack = 0 i.e. the path in which if 1 gets delayed whole gets delayed.
M → N → Q → R → S → U

c. Assuming that all its preceding tasks are performed in exactly the hours estimated how much slack time does Task P have?
Slack time = Latest finish - Early finish = 63 - 50 = 13.

d. Assuming that all its preceding tasks are performed in exactly the hours estimated how much slack time does Task Q have?
Slack time = LF - EF = 53 - 53 = 0
(as it lies on Critical Path)

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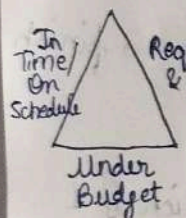
11. **Explain the concept of "Cone of Uncertainty" in software estimation. How does it evolve throughout a project's lifecycle (3 points)**

12. **What are the triple constraints in project management? (Hint: Think about the triangle in drawn in class). Explain briefly how process influences the triple constraints. (4 points)**



13. **What are the key differences between Waterfall and Scrum software development methodologies, and when might you choose one over the other for a project? (3 points)**

requirements will change.