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BRAINWARE UNIVERSITY

Term End Examination 2025-2026

Programme – MCA-2024

Course Name – Software Engineering and UML

Course Code - MCA40116

(Semester IV)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

(i) Software Engineering is mainly concerned with:

- | | |
|---------------------------------|------------------------------------|
| a) Hardware manufacturing | b) Systematic software development |
| c) Database administration only | d) Computer networking only |

(ii) SDLC stands for:

- | | |
|------------------------------------|----------------------------------|
| a) Software Design Logical Cycle | b) System Development Life Cycle |
| c) Software Development Life Cycle | d) System Design Level Cycle |

(iii) The classical Waterfall model is:

- | | |
|------------------------------|---------------------------|
| a) Iterative and incremental | b) Sequential in nature |
| c) Only for small projects | d) Only for agile methods |

(iv) In Waterfall model, testing is performed:

- | | |
|-------------------------|------------------------------------|
| a) Before coding | b) Along with requirement analysis |
| c) After implementation | d) Before design |

(v) The major drawback of Waterfall model is:

- | | |
|--------------------------------------|--------------------|
| a) Too much documentation | b) No clear phases |
| c) Cannot accommodate changes easily | d) No planning |

(vi) The Iterative Waterfall model improves Waterfall by:

- | | |
|--------------------------|-----------------------------|
| a) Removing design phase | b) Including feedback loops |
| c) Removing testing | d) Removing requirements |

(vii) Prototyping model is best suited when:

- | | |
|----------------------------------|-----------------------------|
| a) Requirements are well defined | b) Requirements are unclear |
| c) System is very small | d) No user involvement |

(viii) The main goal of a prototype is:

- | | |
|-----------------------------|--------------------------------------|
| a) Replace the final system | b) Improve requirement understanding |
| c) Skip testing | d) Avoid coding |

- (ix) RAD stands for:
- a) Rapid Application Development
 - b) Random Application Design
 - c) Rapid Analysis Development
 - d) Reliable Application Development
- (x) V-Model is also known as:
- a) Agile model
 - b) Verification & Validation model
 - c) Spiral model
 - d) Prototype model
- (xi) CASE stands for:
- a) Computer Aided Software Engineering
 - b) Computer Assisted System Execution
 - c) Coding and Software Estimation
 - d) Common Algorithm for Software Engineering
- (xii) CASE tools help in:
- a) Automating software development activities
 - b) Preventing coding
 - c) Removing documentation
 - d) Avoiding testing completely
- (xiii) CASE environment includes:
- a) Only compiler
 - b) Tools + repository + integration framework
 - c) CPU only
 - d) RAM only
- (xiv) TQM stands for:
- a) Total Quality Management
 - b) Technical Quality Model
 - c) Total Query Management
 - d) Testing Quality Metric
- (xv) Main objective of TQM:
- a) Reduce customer satisfaction
 - b) Continuous improvement
 - c) Remove customer feedback
 - d) Avoid process

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Predict software failure rate when 5 failures occur in 500 hours of operation. (3)
3. Why is Software Engineering needed in large-scale software development projects? (3)
4. List the major limitations of the Classical Waterfall Model. (3)
5. How does the Iterative Waterfall Model improve the Classical Waterfall Model? (3)
6. Predict software reliability using growth models. (3)

OR

- Estimate Mean Time Between Failures (MTBF) when total operating time is 1,000 hours and number of failures is 10. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. How does the V-Process Model ensure requirement traceability? Show how verification and validation are mapped to SDLC phases. (5)
8. Why does the absence of a formally specified SRS increase project risk? Relate this to cost overrun and schedule slippage. (5)
9. Formulate a solution using CMMI practices to minimize defect rates. (5)
10. Estimate software reliability using reliability metrics and predict failure behavior. (5)
11. Suppose a system shows frequent failures. Propose a reliability growth-based improvement plan. (5)
12. Discuss the McCall Quality Model and elaborate how it helps improve software quality. (5)

OR

- Choose between ISO 9001 and CMM and justify your selection for a growing software firm. (5)
