


VIT

Vellore Institute of Technology
(Approved to be University under section 3 of UGC Act 1956)
Final Assessment Test – November 2025

Course: **BCSE301L - Software Engineering**

Class NBR(s): **2036**

Time: **Three Hours**

Slot: **F2+TF2**

Max. Marks: **100**

- **KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE**
- **DON'T WRITE ANYTHING ON THE QUESTION PAPER**

COs	CO Statements
CO1	Apply and assess the principles of various process models for the software development.
CO2	Demonstrate various software project management activities that include planning, Estimations, Risk assessment and Configuration Management
CO3	Perform Requirements modelling and apply appropriate design and testing heuristics to produce quality software systems.
CO4	Demonstrate the complete Software life cycle activities from requirements analysis to maintenance using the modern tools and techniques.
CO5	Escalate the use of various standards and metrics in evaluating the process and product

BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
Answer ALL Questions
(10 X 10 = 100 Marks)

- 1.a) What software process model would you recommend for each of the scenario and justify with suitable comments **CO1 BL2**
- To develop a new e-commerce platform where the requirements are well-understood and unlikely to change.
 - A mobile app where the user interface is still being defined, and user feedback is crucial.
 - A large, complex, and potentially high-risk financial system.
 - A project that needs to deliver value quickly, with evolving strategy.

OR

- 1.b) Differentiate between Agile and Scrum. What do you mean by timeboxing in Scrum? When can a Sprint be cancelled and by whom? **CO1 BL2**

2.

Match the following:

CO2 BL2

1) Schedule Risk	a) Unanticipated project scope expansion
2) Budget Risk	b) Poor Project Management
3) Operational Risk	c) Communication issues
4) Technical risk	d) Improper implementation of firewalls encryption and intrusion detection system to prevent against cyber threats.
5) Programmatic Risk	e) Include defects, bugs, and low-quality f) Code that can cause errors or crashes.
6) Information technology Risk	g) Sudden changes in market needs or no market development
7) Code Risk	h) Insufficient knowledge and experience of rapidly changing technologies
8) Functional risks	i) The software project not aligning with the company's overall strategy and goals
9) Environmental Risk	j) Relate to the software's features or its inability to meet user requirements
10) Business Risk	k) Include external factors that can impact software development.

3.

For the given set of project tasks,

CO2 BL4

Draw the PERT diagram and find the critical path, project completion time and slack time for non-critical nodes if any

Activity	Time(day)	Require Predecessor
A	4	None
B	3	None
C	2	A
D	1	A
E	1	B
F	2	B
G	3	C
H	2	D, E
I	2	F
J	2	G

4. Assume you as a system analyst, how do you apply software requirement engineering model for an E- healthcare system in identifying the following:

CO3 BL2

- i. Project Scope
- ii. Functional Requirement
- iii. Non – Functional Requirements
- iv. Requirement Prioritization
- v. Requirement Validation

5. Identify all possible classes and interactions among the classes in the following systems and design a class diagram. You may make any reasonable assumptions about the systems when deriving the design.

CO3 BL3

A petrol (gas) station is to be set up for fully automated operation. Drivers swipe their credit card through a reader connected to the pump; the card is verified by communication with a credit company computer; and a fuel limit is established. The driver may then take the fuel required. When fuel delivery is complete and the pump hose is returned to its holster, the driver's credit card account is debited with the cost of the fuel taken. The credit card is returned after debiting. If the card is invalid, the pump returns it before fuel is dispensed.

Also design a activity diagram to show message that flows from one activity to another activity for the scenario given above. Also, identify the design constraints and conditions with parallel, branched and concurrent flow of the system.

- 6.a) Draw the control flow graph and find the cyclomatic complexity for the code snippet given below. Also design the test cases with respect to Statement coverage, Branch coverage and Path coverage to achieve 100% test coverage.

CO4 BL4

Code snippet:

```
S1: a = 0;
S2: b = 0;
S3: Read new_rec; {read a new record (X,Y)}
S4: Repeat
    S5: While A >= 0 OR B >= 0 Do
        S6: if (a < 0) then
            S7: Get X; {read or update X}
            S8: else
            S9: Get Y; {read or update Y}
            S10: Endif
            S11: B = B + X
            S12: A = A + Y
        S13: EndWhile
        S14: if A > 0 then
            S15: Print A, X
        S16: else
            S17: Print B, Y
        S18: Endif
        S19: Read new_rec;
    S20: Until End-of-file
S21: End
```

OR

- 6.b) Briefly explain how a black box testing is carried out using these various techniques like Equivalence Class Partitioning, Boundary Value Analysis, State Transition Testing, and Decision Table Testing with a suitable example. CO4 BL4
7. a) Compare traditional database testing with big data testing. [5] CO4 BL1
b) Explain the importance of testing mobile apps on different network conditions (e.g., Wi-Fi, 3G, 4G, 5G, no network)? [5]
8. a) After deploying a new version of an e-commerce website, users report that the payment gateway is sometimes failing to process transactions. What type of software maintenance is this, and how do you resolve it? CO5 BL3
b) A critical legacy application, written for an older version of Windows, is failing to run after an operating system update to the latest version. What type of software maintenance is required, and how do you resolve it?
c) Users of a project management tool have requested a new feature that allows them to track project risks more effectively. What type of software maintenance would you categorize this request under, and how do you resolve it?
d) A popular web application has become noticeably slower over the past year, particularly during peak usage times, leading to user complaints. What type of maintenance is this, and how do you resolve it.
9. a) What is the main difference between ISO and CMM? CO5 BL1
b) How does TQM relate to ISO and CMM?
c) Which framework is best for a company focused on internal process improvement?
d) Can a company be ISO certified, follow CMM practices, and implement TQM principles simultaneously?
10. Briefly explain why agile is effective in these scenarios: Adaptability, Customer-Centricity, Collaboration and Iterative Improvement. CO1 BL4

⇔⇔⇔ B/L/TY ⇔⇔⇔