


VIT[®]

 Vellore Institute of Technology
(Deemed to be University under section 3 of the UGC Act, 1956)
Final Assessment Test – April 2026

 Course: **CBS3012** - IT Project Management

 Class NBR(s): **2103/2268**

 Time: **Three Hours**

 Slot: **A2**

 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**

General Instructions: Permitted 'Z' Table.

COs	CO Statements
CO1	To understand Project Management activities and to identify basic project management skills with a strong emphasis on issues and problems associated with delivering successful IT projects.
CO2	To Develop activity network to use PERT and to manage project risks such as Resource scheduling and cost control.
CO3	To understand the concept of Agile Project Management and IT Service Management.
CO4	To understand the various terminologies and best practices followed in scrum.
CO5	To learn the concept of Devops and its Working, Automated testing and test driven methods and continuous deployment.
CO6	To demonstrate the working of IT Project Management with various tools and technologies.

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) VIT University plans to develop a Smart Campus Integrated Control System that includes IoT-based classroom automation, biometric access control, real-time surveillance analytics, and energy optimization across multiple campuses. The system must operate under strict real-time constraints, interact with embedded hardware devices, and ensure high reliability and security. The project involves complex hardware-software integration, tight deadlines, and mission-critical operations. The estimated software size is 320 KLOC. **CO1 BL3**
- I. Using the Basic COCOMO model, estimate the effort and development time for the project assuming it falls under the appropriate mode. Additionally, interpret the results in terms of project complexity and discuss whether the estimated schedule is feasible given the scenario constraints. **[5]**
- II. The proposed Smart Campus system at VIT University requires an initial investment of ₹18 crores and is expected to generate annual savings of ₹6 crores through energy efficiency and reduced administrative costs. Evaluate the financial feasibility of this project using appropriate appraisal techniques. Perform a cost-benefit analysis, calculate the payback period and ROI, and justify whether the project is financially viable based on the given data. **[5]**

OR

- 1.b) A mid-sized SaaS company, EduTechSoft, is planning to launch an offline-enabled, multilingual digital learning platform specifically designed for rural and low-connectivity regions. Initial pilot surveys conducted in a few villages indicate moderate interest but actual usage behavior remains unclear due to limited digital literacy and inconsistent device availability. Additionally, existing competitors dominate urban markets, and there is limited data on rural users' willingness to pay for such services.

CO1 BL3

As a project manager analyze the market demand for the proposed product. Identify the key demand indicators and methods to collect and validate the demand data. Justify the recommendation on whether the company should proceed, delay or pivot the project.

2. TechNova Solutions is developing a Smart Healthcare Management System for a multi-specialty hospital. The system includes modules such as patient registration, appointment scheduling, electronic health records (EHR), billing, and reporting. Due to strict deadlines and regulatory requirements, the project manager must carefully plan and monitor the schedule. The major project activities their durations (in days) and dependencies are given below:

CO2 BL3

Activity	Duration (days)	Predecessor(s)
Requirements Analysis	4	—
System Design	6	Requirements Analysis
Database Design	5	Requirements Analysis
Backend Development	7	System Design
Frontend Development	3	Database Design
System Integration & Testing	4	Backend Development, Frontend Development

- a) Construct the project network diagram for the Smart Healthcare Management System and determine the critical path along with the total project duration. Clearly show the sequence of activities and justify why the identified path is critical. [5]
- b) Calculate the **float** for each activity in the project. Based on your analysis, explain how float can assist the project manager in resource allocation, handling delays, and improving overall project scheduling efficiency in this healthcare system implementation. [5]
3. CodeSphere Technologies, is developing a real-time Stock Trading Platform. The project includes modules such as trading engine development, risk analysis, fraud detection, and user dashboard. The initial CPM schedule shows one critical path and two near-critical paths with very low float. However, key activities like Trading Engine Development, Risk Analysis, and Fraud Detection require the same limited team of specialized algorithm engineers. Since only one such team is available, these activities cannot be performed simultaneously and must be scheduled one after another, causing potential delays.

CO2 BL2

- a) From the above given scenario, analyze how resource constraints can alter the critical path, even when the original project network remains unchanged. Discuss the implications for project duration and scheduling. [5]
- b) Given the limited availability of specialized resources, suggest a suitable priority-based scheduling strategy (such as minimum slack, shortest duration, or highest resource demand). Justify which rule would be most effective in this scenario and explain why. [5]
4. CampusConnect Labs is developing an AI-powered Student Performance and Engagement Platform for multiple colleges. The system aims to track student attendance, predict academic performance, provide personalized learning recommendations and generate alerts for at-risk students. The platform is being piloted across several colleges with diverse student populations and varying infrastructure capabilities. However, the project is facing several uncertainties:
- CO2 BL3
- The AI model requires large volumes of accurate student data, but data from colleges is incomplete and inconsistent
 - Faculty members show resistance to adopting the system, preferring traditional methods
 - The development team has limited experience in AI-based educational analytics
 - Frequent changes in academic policies and evaluation patterns are affecting system requirements
 - There are concerns about data privacy and compliance with regulations
- These issues raise concerns about the successful implementation and acceptance of the system.
- a) Identify and classify the risks in the scenario given into project, product, and business risks. Analyze their likelihood and potential impact on the system. [5]
- b) Propose suitable risk management strategies (avoidance, minimization, and contingency plans) for the identified risks, and explain how continuous risk monitoring can be implemented throughout the project. [5]
5. A product-based IT company, PlaySphere Interactive, is developing a live multiplayer gaming platform that allows users to compete in real-time tournaments, interact via chat and unlock dynamic features such as leaderboards and in-game rewards. The gaming market is highly volatile with user preferences changing rapidly based on trends, competitor releases, and player feedback. During the initial development phase the company followed a rigid plan; however it soon encountered several challenges. There were frequent feature change requests driven by continuous player feedback, along with a constant need for rapid updates and bug fixes after each release. Additionally, the team found it difficult to accurately predict requirements for new game modes, while also facing increasing pressure to release incremental features quickly in order to retain users and remain competitive. To address these issues, the company decided to shift towards Agile development, organizing work into short sprints with continuous testing and deployment.
- CO3 BL4

- a) Explain the Agile Manifesto in detail, including its four core values, and analyze how each of these values is relevant to the challenges faced by PlaySphere Interactive. Map each value to the issues described in the scenario and explain how adopting these values would improve development efficiency, flexibility and user satisfaction. [5]

- b) Discuss key Agile principles and practices and explain how these can be effectively implemented in the given gaming platform scenario to improve product quality and responsiveness to market changes. [5]

6. A software company, AutoDrive Systems, is developing an intelligent vehicle management platform for a car manufacturing company. The system is intended to integrate features such as predictive maintenance, vehicle diagnostics, fleet monitoring, and real-time performance analytics for connected cars. During development, the project team encounters several inefficiencies. Multiple features are being developed but are later discarded because they do not align with customer needs. Developers frequently switch between modules such as diagnostics and analytics, leading to reduced productivity. There are delays due to dependencies between hardware integration and software teams. Large amounts of documentation are produced but rarely used, and defects discovered late in testing require significant rework. Despite high effort, the project is experiencing delays, increased costs and reduced overall efficiency. The management is considering adopting Lean Software Development principles to streamline the process and improve value delivery.

CO3 BL4

- a) Identify and explain the different types of waste present in the above scenario and analyze their impact on project efficiency and cost. [5]

- b) Assuming the company adopts Lean Software Development, evaluate how the development approach should be restructured. Discuss how the application of Lean principles would transform the current workflow and improve overall system development and delivery in this automotive platform context. [5]

7.a) The following table represents the remaining story points during a sprint.

CO4 BL4

Day	Remaining Story Points
1	120
2	115
3	110
4	110
5	100
6	95
7	95
8	80
9	60
10	55
11	50
12	50
13	35
14	20

Assume the sprint started with 120 story points planned. Interpret the above burn-down data and perform the following:

- a) Identify two periods where sprint progress stalled and explain possible causes. Determine whether the team is likely to complete the sprint successfully. Justify using burn-down analysis. [5]
- b) Suggest two corrective actions a Scrum Master should take if similar patterns appear in future sprints. [5]

OR

- 7.b) A software company is developing a task management and collaboration platform for corporate clients using the Scrum framework. The product includes features such as real-time task tracking, team collaboration tools, notifications, and reporting dashboards. The Scrum team consists of 5 members and works in fixed-length sprints. Over the last three sprints, the product owner and Scrum master have observed inconsistencies in delivery, increasing spillover work, and concerns about team productivity. Stakeholders are worried about delays in feature releases and the team's ability to meet upcoming deadlines. The following sprint data has been recorded:

CO4 BL4

Sprint	Planned Story Points	Completed Story Points	Spillover Work	Team Size
S1	40	32	8	5
S2	45	38	7	5
S3	50	35	15	5

- a) Evaluate the mismatch between planned and completed story points across sprints and examine what this indicates about sprint commitment, estimation accuracy and team capacity. [5]
 - b) Assuming you are the Scrum master, propose a structured action plan to stabilize team velocity and improve sprint predictability incorporating appropriate Scrum practices and process improvements. [5]
8. A product-based IT company is developing a video streaming platform that supports live streaming, on-demand content, and personalized recommendations. The platform serves a large number of users and requires frequent updates to introduce new features, fix bugs, and ensure smooth performance. To handle continuous releases and maintain system stability, the company has adopted a DevOps pipeline. Developers regularly commit code changes, which are automatically built, tested, and deployed to production environments. The system is continuously monitored to detect performance issues and failures in real time.
- a) Explain the role of each stage in the DevOps lifecycle and analyze how these stages collectively enable faster and continuous delivery in the given scenario. [5]
 - b) Illustrate how automation across these DevOps stages helps reduce manual errors and improves system reliability, particularly in the context of the video streaming platform. [5]

CO5 BL2

9. DeployX Systems, is developing a microservices-based e-commerce platform that includes modules such as user authentication, product catalog, payment processing, and order management. The development team works across multiple environments—local development machines, testing servers, and production cloud infrastructure. Recently, the team has been facing serious issues during deployment. Applications that run correctly in the development environment fail in testing or production due to differences in system configurations, libraries, and dependencies. This has led to frequent delays, increased debugging effort, and unreliable releases. To address these issues, the DevOps team is considering adopting Docker containerization, while also evaluating whether traditional virtual machines (VMs) could be an alternative solution.

CO5 BL3

- a) Explain how Docker containerization can help resolve the environment inconsistency issues described in the scenario. Discuss the role of key components such as Docker images and containers. [5]
- b) Differentiate between virtual machines and Docker containers in the context of the given scenario, and evaluate the advantages of using Docker containers over virtual machines in a DevOps environment. [5]

10. A startup is developing a digital content management platform with a small team responsible for design, development, and testing activities. Initially, the team managed tasks informally through meetings and shared documents. As the project progressed, several challenges began to surface. Tasks were not clearly organized, resulting in confusion and duplication of work. Team members lacked visibility into task status and dependencies, making coordination difficult. There was no structured mechanism to track progress across different stages of development, and communication gaps started to widen as the team expanded. Consequently, the project manager found it increasingly difficult to monitor the overall workflow and ensure timely completion of deliverables, leading to delays and reduced team efficiency.

CO6 BL4

Examine the issues described in the scenario and recommend a suitable tool-based approach to improve task management and workflow visibility. Explain how the chosen tool and its features can help streamline collaboration, track progress, and enhance project coordination.

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