



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 5 Examination in Engineering: March 2026

Module Number: IS5123

Module Name: Project Management (C-23)

[Two Hours]

[Answer all questions]

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- Q1. a) Briefly explain the term 'Project' in your words. [2 Marks]
- b) Explain the concept of 'Work Breakdown Structure (WBS)' by using an example from your engineering specialization. [4 Marks]
- c) Briefly explain the four (04) ethical issues faced by a project manager. [4 Marks]

- Q2. Read the following case and answer the questions.
Case: National Digital Education Transformation Project

The Ministry of Education of a country has initiated a National Digital Education Transformation Project to modernize the education system by integrating digital technologies into all public schools. The project aims to introduce online learning platforms, provide tablets to students, train teachers, and digitize educational content within 18 months. Mr. Perera, an experienced project manager, has been appointed to lead this large-scale initiative. The project involves multiple stakeholders, including government agencies, technology providers, school administrators, teachers, students, and parents. The project is constrained by a fixed national budget and strict political deadlines. As the project progresses, several complexities arise. Stakeholder expectations differ significantly—teachers demand more training, while policymakers push for rapid implementation. Frequent changes in project scope occur due to evolving technological requirements and policy decisions. Communication gaps between central authorities and rural schools create inconsistencies in implementation. Additionally, resistance to change from educators and technical challenges in remote areas further delay progress. Budget constraints limit the ability to procure high-quality devices, forcing trade-offs between cost and quality. Mr. Perera must navigate these challenges while balancing competing demands, ensuring stakeholder alignment, and maintaining control over project scope, schedule, and cost. The success of the

project depends on effective leadership, strategic decision-making, and the ability to manage uncertainty in a complex environment.

- a) State the four (04) key characteristics of the project with evidence. [4 Marks]
- b) Describe four (04) responsibilities of Mr. Perera as the project manager. [4 Marks]
- c) Explain two (02) common reasons for often failure of this nature of projects. [2 Marks]

Q3. Using the information in Table 1;

- a) Draw a network diagram using Activity on Arrow (AoA) method. [5 Marks]
- b) Calculate EST, EFT, LST, LFT and Slack for each activity. [10 Marks]
- c) Find the project completion time. [3 Marks]
- d) State the critical path. [2 Marks]

Table 1

Activity	Predecessor	Duration (days)	
A	Project Start	2	–
B	Initial Design	4	A
C	Procurement	3	A
D	Site Preparation	3	B
E	Material Delivery	2	C
F	Implementation	5	D, E
G	Quality Check	2	D
H	Final Testing & Completion	2	F, G

(EST – Earliest Start Time , EFT- Earliest Finish Time, LST – Latest Start Time, LFT- Latest Finish Time)

- Q4. Consider the same project described in Q3. Table 2 provides some additional information for the same project, in addition to the information given in Table 1. If the client wants to reduce the project completion by 2 days, calculate the minimum additional cost required. Explain all the steps very clearly with reasons for your selection (activity and number of days).

Table 2

Activity	Crash Time (Days)	Normal Cost (Rs.)	Crash Cost (Rs.)
A	1	20,000	22,750
B	2	30,000	34,000
C	1	26,000	27,000
D	2	48,000	49,000
E	1	56,000	58,000
F	3	30,000	36,000
G	1	80,000	80,500
H	1	16,000	19,000

[20 Marks]