



GENERAL SIR JOHN KOTELAWALA DEFENCE UNIVERSITY

Faculty of Engineering

Department of Electrical, Electronic and Telecommunication Engineering

B.Sc. Engineering Degree

Semester 6 Examination – September/October 2024

(Intake 39 – EE, ET)

EE 3242 – PROJECT MANAGEMENT

Time allowed: 2 Hours

03 October 2024

ADDITIONAL MATERIAL PROVIDED

None

INSTRUCTIONS TO CANDIDATES

This paper contains 4 questions on 6 pages

Answer ALL questions.

This is a closed book examination

This examination accounts for 70% of the module assessment. The marks assigned for each question and parts thereof are indicated in square brackets

If you have any doubt as to the interpretation of the wordings of a question, make your own decision, but clearly state it on the script

Assume reasonable values for any data not given in or provided with the question paper, clearly make such assumptions made in the script

All examinations are conducted under the rules and regulations of the KDU

DETAILS OF ASSESSMENT

Learning Outcome (LO)	Questions that assess LO	Marks allocated (Total 70%)
LO1	Q1	24
LO2	Q2	18
LO3	Q3	14
LO4	Q4	14

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Question 1

- (a) Briefly explain three (03) key benefits of effective project management and three (03) potential consequences of poor project management. *Many contain* *set of sketch* [06]
- (b) Describe the relationship between Project Management and other management disciplines within an organization. *PM OM PM SM PM HRM* [02]
PM
- (c) Explain with suitable diagram how the cost and staffing level of a typical project varies with time, from initiation to the closing of the project. *initiation org. closing* [03]
closing
- (d) Describe the role of the Project Manager, emphasizing their influence on the project, the organization, and the industry. [03]
- (e) As the project manager for a new mobile app development project with the goal to launch within six months, develop a project schedule management plan by outlining the key activities and criteria for developing, monitoring, and controlling the project timeline. [06]
- (f) Project Procurement Management includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team. Select the most suitable source selection method for each of the following procuring scenarios and briefly explain your reasoning. *Quality cost* *side supplier* *high technical score* [04]
- i) Procuring office supplies for a newly furnished office
 - ii) Hiring an engineering firm for the construction of a nuclear power plant
 - iii) Purchasing highly specialized medical imaging equipment
 - iv) Designing a public children's park with an LKR 150 million budget *fixed budget*

Question 2

A new public park is to be constructed in the Port City of Colombo under the sponsorship of the Colombo Municipal Council. You have been appointed as the project manager of the project. The project is aimed to be completed in 1 year within a budget of LKR 400 million. The project includes developing landscaping, walking trails, playground, and picnic areas.

- (a) Generate a project charter for the above project. [08]
- (b) Generate a Work Breakdown Structure for the project [08]
- (c) Briefly explain the importance of Project Integration Management [02]

Question 3

- (a) Briefly explain how each of the six key processes of project resource management as outlined in the Project Management Body of Knowledge (PMBOK) can be applied to one of the following projects.

- i) Development of a 10 MW municipal solid waste-fired thermal power station
- ii) Development of a E-Learning software application for Engineering Undergraduates

[05]

- (b) Explain a method that can be used to assess the quality of the project selected in Q3 (a).

Reason for X

[02]

- (c) A client has requested an assessment of the viability of installing a rooftop solar PV system on an existing building. The details of the solar PV system are given in Table Q3(c) below.

Table Q3 (c)

Parameter	Value
Capacity of the rooftop solar PV system	4 kW ✓
Capital cost of the rooftop solar PV system	Rs. 1,200,000.00
Operations and Maintenance Cost	Rs. 5,500.00 per year
Operation Period	20 years ✓
Construction Duration	1 week (negligible)
Plant Factor	20% ✓
Average cost of electricity	Rs. 30.00 per kWh
Discount Rate (r)	12%

The client is also considering an alternative investment in real estate, where the Net Present Value (NPV) of the real estate investment is Rs. 300,000.00

Assess the financial feasibility of investing in the rooftop solar PV system and recommend which investment offers higher returns in the long term, taking into account future cash flows.

[07]

Hint: If the discount rate is r , for a period of n years, the present worth factor is given by,

$$\sum_{t=1}^n \frac{1}{(1+r)^t} \text{ which is equal to } \frac{1}{r} \left[1 - \frac{1}{(1+r)^n} \right]$$

Question 4

“Skyline Construction”, a newly established company specializing in the construction of high-rise buildings, has been awarded a contract to build a 30-story residential high-rise in Colombo City, Sri Lanka. As the appointed Project Manager, you are responsible for overseeing all aspects of the project, which is currently in the planning phase.

- (a) Identify and assess four (04) types of risks associated with the project [04]
- (b) You are evaluating two potential investment options for the top floor of the building. You must choose between leasing the top floor to a luxury hotel chain (Option A) or converting the space into high-end penthouses for sale (Option B). You decide to use Expected Monetary Value (EMV) analysis to make an informed decision. The details are given in Table Q4 (b).

Table Q4 (b)

Option	Profit	Risk
A	LKR 360 million	There is a 20% chance the hotel chain will withdraw from the lease, resulting in a loss of LKR 150 million due to the space remaining unoccupied.
B	LKR 600 million	There is a 40% chance that a market slump will occur, leading to a reduction in sale price, resulting in a loss of LKR 260 million.

Calculate the EMV for both options and determine which investment provides the higher potential return. [06]

- (c) Developing a Risk Assessment Matrix for a project is a qualitative method used to assess the risks associated with the project. One of the experts has predicted that following risks can be occurred during the construction period of the project.
- i) Heavy rain when pouring concrete, leading to significant delays
 - ii) Labour strikes that could cause the project to slowdown, but can be resolved within few weeks
 - iii) Material supply issues that can be managed with minimal impact on the project timeline

For each risk, identify its placement within a 4x4 Risk Assessment Matrix based on the likelihood and impact of the risk. Provide a brief explanation for your reasoning behind the placement of each risk. [04]

Hint: Consider the 4x4 risk assessment matrix given in Table Q4 (c) to support your answer

Table Q4 (c)

		Impact of the risk			
		Minor 1	Moderate 2	Significant 3	Catastrophic 4
Likelihood of the risk	Almost Certain 4	Moderate	High	Extreme	Extreme
	Likely 3	Low	Moderate	High	Extreme
	Unlikely 2	Very Low	Low	Moderate	High
	Rare 1	Very Low	Very Low	Low	Moderate

End of question paper