



M.E. DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Third Semester

M.E. INDUSTRIAL ENGINEERING

P18IEE3014 : Value Engineering

COURSE OUTCOMES

- CO1:** Understand the concepts of value stream mapping for improving process performance.
- CO2:** Apply Value engineering techniques for real time industrial problems.
- CO3:** Understand the importance of Team approach in Value engineering.
- CO4:** Classify the various cost models of Value Engineering and phases involved in a job plan
- CO5:** Extend the value engineering knowledge with reference to industrial case studies.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Assertion (A): Calculation of costs involves the addition of both direct and indirect costs to determine the total expenses associated with a product or service. CO1 [K₁]
Reason (R): Cost allocation to function is crucial in Value Engineering as it helps in determining the cost-effectiveness of each function and aids in prioritizing improvements.
- a) Both Assertion (A) and Reason (R) are false b) Assertion (A) is true and Reason (R) is false
c) Both Assertion (A) and Reason (R) are true. d) Assertion (A) is false and Reason(R) is true.
2. Which sectors in India have prominently adopted Value Engineering? CO1 [K₁]
a) Agriculture b) Manufacturing
c) Education d) Tourism
3. Which of the following criteria is commonly used in Godson feasibility ranking? CO2 [K₁]
a) Legal feasibility b) Time feasibility
c) Human resource feasibility d) Aesthetic feasibility

4. Matching type item with multiple choice code

CO2 [K₁]

List I	List II
A. Break-even Point	i. Costs that remain constant regardless of the level of production or sales.
B. Fixed Costs	ii. Costs that change proportionately with the level of production or sales.
C. Contribution Margin	iii. The point at which total revenue equals total cost, resulting in zero profit or loss
D. Variable Costs	iv. The amount by which sales revenue exceeds variable costs.

- | | A | B | C | D |
|----|-----|-----|-----|-----|
| a) | i | iii | iv | ii |
| b) | ii | iv | i | iii |
| c) | iii | i | iv | ii |
| d) | iv | ii | iii | i |

5. Assertion (A): A well-structured team is essential for effective team building, which, in turn, influences the selection of an appropriate consultant for a project. CO3 [K₁]

Reason (R): A cohesive team with clearly defined roles and responsibilities fosters an environment conducive to effectively assessing and selecting consultants based on project needs.

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| a) Assertion (A) is true and Reason (R) is false | b) Both Assertion (A) and Reason (R) are true. |
| c) Assertion (A) is false and Reason(R) is true. | d) Both Assertion (A) and Reason (R) are false |

6. Which phase in project management involves conducting workshops to gather information and insights for a project? CO3 [K₁]

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|--------------------------|-----------------------------|
| a) Pre-study Phase | b) Project Initiation Phase |
| c) Project Closure Phase | d) Host Study Phase |

7. Choose the correct sequence. CO4 [K₁]

- A. Breakdown of costs based on project functions.
- B. Emphasis on exploring cost drivers and their relationships.
- C. Detailed examination of cost allocations.
- D. Focus on analyzing various cost elements in relation to a matrix structure.

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|------------|------------|
| a) A, B, C | b) B, C, E |
| c) A, C, D | d) A, D, E |

8. Assertion (A): The primary purpose of employing economic principles in Life Cycle Costing (LCC) is to assess the total costs associated with a product or project over its CO4 [K₁]

entire life cycle.

Reason (R): Economic principles in LCC help in making informed decisions by considering all relevant costs, including initial, operational, and maintenance costs, and their implications on long-term expenses.

- a) Both Assertion (A) and Reason (R) are true. b) Both Assertion (A) and Reason (R) are false
- c) Assertion (A) is true and Reason (R) is false d) Assertion (A) is false and Reason(R) is true.
9. Which phase of Value Engineering are used during data collection, review, and analysis performed to understand the project better? CO5 [K₁]
- a) Implementation Phase b) Evaluation Phase
- c) Analysis Phase d) Information Phase
10. Choose the following steps in the correct sequence for an industrial case study involving Value Engineering: CO5 [K₁]
- A. Analysis of current processes and costs.
- B. Identification and definition of the problem.
- C. Brainstorming and generating innovative ideas.
- D. Implementation of selected improvement ideas.
- E. Evaluation and quantification of potential improvements.
- F. Collection of data related to the project.
- a) B, F, A, C, E, D b) F, B, A, E, C, D
- c) F, B, A, C, E, D d) B, F, A, E, C, D

PART B (10 x 2 = 20 Marks)

11. What is the current status of Value Engineering (VE) adoption in India, and what factors contribute to its growth? CO1 [K₁]
12. List the primary elements of costs in the context of Value Engineering. CO1 [K₂]
13. Explain the key principle behind brainstorming in Value Engineering. CO2 [K₂]
14. What is the primary purpose of break-even analysis. CO2 [K₁]
15. Define the primary criterion for selecting a consultant in Value Engineering. CO3 [K₁]
16. List the objective of the host study phase in a project. CO3 [K₁]
17. Define cost models. CO4 [K₁]
18. What are the significance of economic principles in Life Cycle Costing. CO4 [K₁]
19. Define the Implementation Phase. CO5 [K₁]
20. What is the primary goal of the information Phase in project management? CO5 [K₁]

PART C (10 x 5 = 50 Marks)

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| 21. | Explain the key impacts of applying value engineering in a construction project. | CO1 | [K ₅] |
| 22. | Discuss the role of cost-benefit analysis in determining the worth of Value Engineering proposals. | CO1 | [K ₆] |
| 23. | Summarize the ABC analysis technique and its significance in inventory management. | CO2 | [K ₂] |
| 24. | Examine the advantages and limitations of using a matrix for evaluation in decision-making processes. | CO2 | [K ₃] |
| 25. | Explain the essential criteria and considerations for selecting consultants to support organizational projects. | CO3 | [K ₂] |
| 26. | Discuss the objectives and significance of the host study phase in project management. | CO3 | [K ₃] |
| 27. | Explain the concept of Matrix Cost Models in cost estimation and project management. | CO4 | [K ₂] |
| 28. | Explain the steps involved in Life Cycle Costing (LCC) and its significance in project evaluation. | CO4 | [K ₂] |
| 29. | Discuss the importance of Functional Analysis in problem-solving methodologies. | CO5 | [K ₃] |
| 30. | Discuss a manufacturing case study where value engineering principles were crucial in adapting to market demands and consumer preferences. | CO5 | [K ₃] |

Answer any TWO Questions

PART D (2 x 10 = 20 Marks)

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| 31. | Explain in detail about the process and significance of creating a Customer-Oriented Function Analysis System Technique (FAST) diagram in product development. | (10) | CO2 | [K ₂] |
| 32. | Elaborates on the importance and application of a Task Flow Diagram. | (10) | CO3 | [K ₃] |
| 33. | Explain the concept of Life Cycle Costing (LCC) in detail. | (10) | CO4 | [K ₂] |
