

Enrollment No: _____

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech Mid Semester Exam

Semester: 8th
Subject Code: 203103455
Subject Name: CEPDE

Date: 30/01/2024
Time: 10:30 AM to 12:30 PM
Total Marks: 40

Sr. No.

Marks

Q.1 (A)

1. What is the primary role of a chemical engineer in plant design?
 - a. Financial analysis
 - b. Process optimization
 - c. Marketing strategies
 - d. Legal compliance
2. Which diagram is commonly used for cost estimation in chemical engineering?
 - a. Flowchart
 - b. Gantt chart
 - c. Cash flow diagram
 - d. PERT diagram
3. What does "total capital investment" in plant design encompass?
 - a. Only fixed capital
 - b. Only working capital
 - c. Both fixed and working capital
 - d. Operating costs only
4. What is an essential factor in evaluating depreciation methods in chemical engineering?
 - a. Initial investment
 - b. Project timeline
 - c. Market demand
 - d. Technological advancements
5. How is equipment cost typically estimated in plant design?
 - a. Based on historical data
 - b. Random estimation
 - c. Trial and error method
 - d. Guesswork

05

(B)

1. _____ diagrams play a crucial role in cost estimation in chemical engineering.
2. _____ is the total sum of fixed and working capital in plant design.
3. The evaluation of _____ is important for assessing the economic life of assets.
4. _____ studies help in comparing the profitability of different investment options.
5. _____ methods are used to determine the cost of equipment in plant design.

05

- Q.2 Attempt any four(Short Questions) 12
- (1) Define: Fixed cost, Working cost, capital cost, capitalized cost.
- (2) What is Tax? Write types of taxes and what taxes are mandatory for Industries.
- (3) Explain: Objective and needs of cost Estimation.
- (4) Write methods of Cost estimation.
- (5) Define: Turnover Ratio, Payback Period, Salvage value

- Q.3 Attempt any two questions 08
- (1) Draw & Explain Cash Flow Daigram for Industrial Operations.
- (2) What is a break-even chart? Draw a diagram illustrating operating time and the rate of production.
- (3) What is Depreciation? Write various methods of depreciation with formulas.

- Q.4 (A) The purchased cost of a 20 m³, Heat exchanger, shell-and-tube, fixed sheet, c.s. was \$5,00,000 in 2011. Estimate the purchased cost of a similar 30 m³, Heat exchanger, shell-and-tube, fixed sheet, c.s. in 2016. Use the annual average Chemical Engineering plant cost index to update the purchase cost of the Heat exchanger. The equipment-cost versus capacity exponent is 0.44.

Year	Chemical Engineering plant cost index
2010	998
2011	1082
2012	1123
2013	1284
2014	1386
2015	1456
2016	1550
2017	1601
2018	1784
2019	1823
2020	1980

- (B) What is the techno-economic feasibility of the project? Analyze your project's techno-economic feasibility. Is your project feasible? 05

OR

- (B) Write down the various factors or parameters required for general design considerations related to plant design. 05