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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

July 2023 Semester End Main Examinations

Programme: B.E.

Branch: Chemical Engineering

Course Code: 19CH6HSEIE

Course: Economics in Engineering

Semester: VI

Duration: 3 hrs.

Max Marks: 100

Date: 14.07.2023

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I			<i>CO</i>	<i>PO</i>	Marks
1	a)	What is a feasibility report? Enlist the types of feasibility report	<i>CO1</i>	<i>PO1</i>	08
	b)	What are the factors should be considered in selecting a chemical plant site? Explain in detail.	<i>CO6</i>	<i>PO11</i>	12
UNIT - II					
2	a)	What is the cost index? Explain the various Chemical Engineering cost indices.	<i>CO2</i>	<i>PO10</i>	04
	b)	Explain the elements of cost and its classification.	<i>CO2</i>	<i>PO10</i>	06
	c)	A certain piece of work is produced by a firm in batch of 100. The direct material cost for that 100-piece work is Rs. 160/- and direct labor cost is Rs. 200/-. Factory cost is 35% of the total material cost and labor cost. Overhead charges are 20% of the factory cost. Estimate the following. (i) Prime cost and factory cost. (ii) If the management wants to make the profit of 10% on the gross cost, determine the selling price of each article.	<i>CO2</i>	<i>PO10</i>	10
UNIT - III					
3	a)	A company wants to set up a reserve which will help the company to have an annual equivalent amount of Rs. 10,00,000 for the next 20 years towards its employee's welfare measures. The reserve is assumed to grow at the rate of 15% annually. Find the single payment that must be made now as the reserve amount.	<i>CO3</i>	<i>PO2</i>	10
	b)	A major chemical engineering firm desires an economic analysis to determine which of the two equipment is attractive in each interval of time. The minimum attractive rate of return for the firm is 15%. The following data are to be used in the analysis:	<i>CO3</i>	<i>PO2</i>	10

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			<table border="1"> <tr> <td></td><td>Equipment X</td><td>Equipment Y</td><td></td><td></td><td></td></tr> <tr> <td>First cost</td><td>Rs. 1,50,000</td><td>Rs. 2,40,000</td><td></td><td></td><td></td></tr> <tr> <td>Estimated life</td><td>12 years</td><td>12 years</td><td></td><td></td><td></td></tr> <tr> <td>Salvage value</td><td>Rs. 0</td><td>Rs. 6,000</td><td></td><td></td><td></td></tr> <tr> <td>Annual maintenance cost</td><td>Rs. 0</td><td>Rs. 4,500</td><td></td><td></td><td></td></tr> </table>		Equipment X	Equipment Y				First cost	Rs. 1,50,000	Rs. 2,40,000				Estimated life	12 years	12 years				Salvage value	Rs. 0	Rs. 6,000				Annual maintenance cost	Rs. 0	Rs. 4,500			
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			<p>Which machine would you as an engineer will choose based on annual equivalent cost? Infer your result.</p>																														
			OR																														
4	a)	What is effective Interest Rate and Nominal Interest rate?			CO3	PO2	04																										
	b)	A person invests a sum of Rs. 50,000/- in a bank at a nominal interest rate of 12% for 10 years. The compounding is quarterly. Find the maturity amount of the deposit after 10 years.			CO3	PO2	06																										
	c)	A person is planning for his retired life. He has 10 more years of service. He would like to deposit Rs. 8,500 at the end of the first year and thereafter he wishes to deposit the amount with an annual decrease of Rs. 500 for the next 9 years with an interest rate of 15%. Draw the cash flow diagram and calculate the total amount at the end of the 10 th year.			CO3	PO2	10																										
		UNIT - IV																															
5	a)	Explain the Sum of digits method & Declining Balance Method of computing depreciation in detail.			CO4	PO2	10																										
	b)	An evaporator was purchased for Rs. 5,00,000/- of 1 st Jan 2023. The commissioning and installation work cost Rs. 1,00,000/-. The evaporator was replaced by a new one on 31 Dec 2053. If the salvage value was estimated is Rs. 50,000/-. (i) What should be rate of depreciation and depreciation fund on 15 th June 2033? (ii) If after 20 years of running of evaporator some of the calandria tubes are replaced and replacement cost is Rs. 50,000/-. Estimate the new rate of depreciation.			CO4	PO2	10																										
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6	a)	What is a Tax? Enlist the types of tax and explain why it is levied?			CO4	PO2	05																										
	b)	Explain the sinking fund method of computing depreciation			CO4	PO2	05																										

	c)	<p>The following are the items of the profit and loss account for M/s. BCA Company for the year ended on 31st March 2009. You are required to arrange them systematically and indicate (a) Profit before taxation and (b) Profit after taxation.</p> <p>M/s. BCA Company Profit and loss account for the year ended 31st March 2009 is as follows.</p> <table border="1"> <thead> <tr> <th>Particulars</th><th>Amount in Rs (Lakhs)</th><th>Particulars</th><th>Amount in Rs (Lakhs)</th></tr> </thead> <tbody> <tr> <td>Sales and Service</td><td>69,553</td><td>Administrative expenses</td><td>10,441</td></tr> <tr> <td>Provision of Wealth Tax</td><td>3.5</td><td>Depreciation</td><td>1,383</td></tr> <tr> <td>Provision of Income Tax</td><td>210</td><td>Other income</td><td>517</td></tr> <tr> <td>Excess provision of tax in previous years</td><td>143</td><td>Proposed dividend</td><td>643.8</td></tr> <tr> <td>Cost of sales and Service</td><td>54,774</td><td>Interest</td><td>2595</td></tr> </tbody> </table>	Particulars	Amount in Rs (Lakhs)	Particulars	Amount in Rs (Lakhs)	Sales and Service	69,553	Administrative expenses	10,441	Provision of Wealth Tax	3.5	Depreciation	1,383	Provision of Income Tax	210	Other income	517	Excess provision of tax in previous years	143	Proposed dividend	643.8	Cost of sales and Service	54,774	Interest	2595	CO4	PO2	10
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		UNIT - V																											
7	a)	What is a financial statement? Enlist the types of financial statements and explain in detail	CO5	PO4	08																								
	b)	<p>From the following data, you are required to calculate break-even point and net sales value at this point:</p> <table border="1"> <tbody> <tr> <td>Direct Material Cost per unit</td><td>Rs. 10</td></tr> <tr> <td>Direct labor cost per unit</td><td>Rs. 5</td></tr> <tr> <td>Fixed overhead</td><td>Rs. 50,000</td></tr> <tr> <td>Variable overheads</td><td>60% on direct labor</td></tr> <tr> <td>Selling price per unit</td><td>Rs. 25</td></tr> <tr> <td>Trade discount</td><td>4%</td></tr> </tbody> </table> <p>If sales are 10% and 25% above the break even volume, determine the net profits.</p>	Direct Material Cost per unit	Rs. 10	Direct labor cost per unit	Rs. 5	Fixed overhead	Rs. 50,000	Variable overheads	60% on direct labor	Selling price per unit	Rs. 25	Trade discount	4%	CO5	PO4	12												
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