Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2013

Subject code: 714605 **Date: 11-06-2013**

Subject Name: Engineering Economics and Financial Management

Time: 10.30 am – 01.00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Attempt the following questions. **07**

1. Why value of money is changed with respect to time?
2. Explain: Role of Engineering Economy in decision making of engineering industries.
3. Compare: Simple interest and Compound interest.

(b) Prepare a balance sheet of Amin Engg. Co. Ltd. with the help of following financial data as on 31/3/2013. Calculate the working capital and current liquidity ratio. **07**

Details	***Amount in Rs. (lacs)***
Å Cash in hand ----------	25
Å Machinery of plant ----------	330
Å Vehicles ----------	30
Å Work in Progress ----------	24
Å Share capital ----------	100
Å Cash in bank account----------	32
Å Raw material stock ----------	15
Å Finished goods stock ----------	16
Å Payment to be made in 45 days ----------	22
Å Payment to be received from customers (30 days) --	10
Å Loan taken from bank for 5 years ----------	120
Å Building ----------	42
Å Share premium account ----------	200
Å Reserves ----------	75

Q.2 **(a)** A Works Manager is trying to decide between two machines with the estimates presented below. **07**

	Machine A	Machine B
First cost, P (Rs)	60,000	90,000
Annual Operating Cost, (AOC)	20000	25,000
Salvage Value (SV), Rs.	12,000	15,000
Life, (years)	3	6

Determine which machine should be selected on the basis of Present Worth (PW) Analysis, if rate of interest is 10% / year.

(b) A small water utility is trying to decide between installing a laboratory for conducting the required water analysis or sending samples to a private laboratory. For establishment of laboratory, initial investment of Rs.3,00,000 will be required. In addition, a full time technician will have to be hired at a cost of Rs.4000 /month. A total of 400 analytical tests are required each month. **07**

If the analysis is done in-house, the cost /sample will average Rs.3, but if the samples are sent to an outside lab, the average cost will be Rs.25. The equipment purchased for lab is expected to have a useful life of 5 years. If the utility uses an interest rate of 10% /year, determine the **Benefit to cost ratio** for the project.

OR

(b) A city engineer is considering two alternatives for the local water supply. **07**

First alternative: The construction of earthen Dam on a near by river, which has highly variable flow. The dam will form a reservoir, so the city may have a dependable source of water. Initial cost = Rs. 80,00,000; Annual upkeep cost = Rs. 25,000; Life of dam is expected to last infinitely.

Second alternative: Drilling of wells as needed and construct pipelines for transport of water. Average 10 wells are required.

Initial cost = 45,000 per well, including pipe line Average life = 5 years; Annual operating cost = Rs.12,000 per well. If i = 10% per year, which alternative should be selected on the basis of **Capitalized Cost**?

Q.3 **(a)** 1. A person is investing 1,00,000 in term deposit now, and how much money will be accumulated (compound) at interest rate of 10% and after 8 years? Draw cash flow diagram. **07**

2. How much money should be invested that is guaranteed to yield Rs. 8,000/- per year for 10 years starting from next year, at an interest of 10% per year? Draw cash flow diagram.

(b) 1. Explain: Fixed cost and Variable cost. **07**

2. A product is manufactured in the batch of 200 quantities. The direct material cost is Rs. 3400, and direct labour cost is Rs. 2600. Consider overheads as 50% of direct costs, and marketing expenses are Rs.25 / product. If selling price is Rs.100 per product, then find the profit / product.

OR

Q.3 **(a)** A small engineering company has following department-wise actual costing. Apportion the overheads to the workshops. Apportion of administration should be on purchase and apportion of purchase & stores should be on two shops. **07**

Cost Centers	**Department Overheads**	**No. of people**	**Direct Material Cost**
Administration	40,000	2	-
Purchase & stores	60,000	2	-
Fabrication shop	80,000	18	3,10,000
Painting shop	70,000	12	1,40,000
	2,50,000	*34*	*4,50,000*

	(b)	1. What is depreciation? What are different methods of depreciation?	**07**
		2. The cost of a car is Rs. 6,00,000, scrap value is Rs. 50,000, estimated life = 10 years, Depreciation rate = 10%. Calculate the annual depreciation by Straight line method.	
Q.4	**(a)**	1. What are the important factors of production? Explain significance of each factor.	**07**
		2. Explain: Break Even Point (BEP) Analysis along with graphical representation.	
	(b)	1. What is division of labour? What are the advantages of making divisions of labour?	**07**
		2. Explain: óProduct Life Cycleô with significant features of its four stages along with nature of curve.	

OR

Q.4	**(a)**	1. What are the advantages of large scale production?	**07**
		2. Compare between direct cost and indirect cost.	
	(b)	1. Explain: Law of Demand with nature of curve.	**07**
		2. Enlist different methods of long term financing? Explain any one.	
Q.5	**(a)**	Explain: Profit-Volume ratio in the context of costing. (with sketch)	**07**
	(b)	Explain: Reducing balance method of depreciation. (with sketch)	**07**

OR

Q.5	**(a)**	Explain: Primary market and Secondary market.	**07**
	(b)	Which are different ratios of a financial statement? Define any two.	**07**

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