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THIRD SEMESTER   B. Tech.

Supplementary End-Semester Examination   Feb-2019

HU- 201: Engineering Economics

Time: 3 Hour   Max. Marks: 50

Note: Answer Any Five questions,
Assume suitable missing data, if any

1(a) Discuss in detail Price Elasticity and Cross Elasticity of Demand. Also discuss their relevance in business.   5

1(b) In the design of a jet engine part, the designer has a choice of specifying either an aluminum alloy casting or a steel casting. Either material will provide equal service, but the aluminum casting will weigh 1.2 Kg. as compared with 1.35 Kg. for steel casting. The aluminum can be cost Rs. 80.00 per Kg. and the steel one for Rs. 35.00 per Kg. The cost of machining per unit is Rs. 150.00 for aluminum and R. 170.00 for steel. Every Kilogram of excess weight is associated with a penalty of Rs. 1300 due to increased fuel consumption. Which material should be specified and what is the economic advantage of the selection per unit?   2

1(C) The chief engineer of refinery operation is not satisfied with the preliminary design for storage tanks to be used as part of a plant expansion programme. The engineer who submitted the design was called in and asked o reconsider the overall dimensions in the light of an article in the "Chemical Engineer", entitled "How to size future process vessels"?   3

The original design submitted called for 4 tanks 5.2 m is diameter and 7 m in height. From a graph of the article the engineer found that the present ratio of height to diameter of 1.35 is 111% of the minimum cost and that the minimum cost for a tank was when the ratio of height to
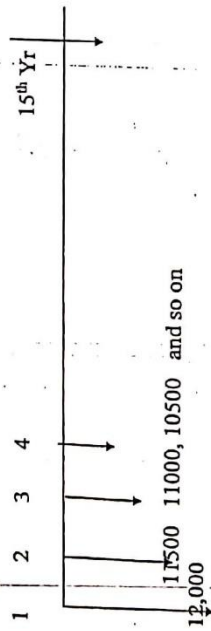
6(a) Discuss salient features of the Indian economy.   5

6(b) Consider following cash flow diagram. Calculate the total amount received at the end of the 15th year at the interest rate of 11%, compounded annually.   5

$$1 \quad 2 \quad 3 \quad 4 \quad \cdots \quad 15^{th}\ Yr$$

12,000   11500   11000,   10500   and so on

7(a) Discuss Business Risk which you will consider while deciding location for your foreign venture.   5

7(b) Two years ago, a machine was purchased at a cost of Rs. 4,00,000 to be useful for ten years. Its salvage value at the end of its life is Rs. 60,000. The annual maintenance cost is Rs. 60000. The market value of the present machine is Rs. 320000. Now a new machine to cater to the need of the present machine is available at Rs. 3,80,000 to be useful for eight years. Its annual maintenance cost is Rs. 45000. The salvage value of the new machine is Rs. 40000. Using an interest rate of 11%, find whether it is worth replacing the present machine with the new machine?   5

diameter was 4:1. The cost for the tank design as originally submitted was estimated to be Rs. 9,00,000. What are the optimum tank dimensions if the volume remains the same as the original design? What total savings may be expected through the redesign?

2(a) If you are CEO of a company, discuss factors which you will consider while deciding price of your product in the market. [5]

2(b) What amount of money saved today will yield Rs. 40,000/- in third year and Rs. 55,000/- after five year at the 12% rate of interest compounded annually. [2]

2(c) A company has to replace a machine in the production line after 11 years at the cost of Rs. 60,00,000/-. It plans to deposit an equal amount at the end of every year for the next 11 years at an interest rate of 11 per cent which is compounded annually. Find the equivalent amount that must be deposited at the end of every year for next 11 years. [3]

3(a) Discuss the nature of soft drink market in India. What incentive may be given by the Government to encourage Indian producer? [5]

3(b) Below is given a demand equation;

$$Q = -6P + 4000$$

Calculate price elasticity of demand if price is (i) Rs. 4 (ii) Rs 10 and (iii) Rs. 15. Is the demand at these prices elastic or inelastic? [2]

3(c) The market supply and demand functions for deluxe pizzas in a small town are given by

Demand $Q = 100 - 3.5\,P$

Supply $Q = 15 + 1.5\,P$

i. Determine the equilibrium price and quantity.

ii. If the city Government levies a tax of Rs. 3.00/pizza on the pizza parlor, determine the [3]

new equilibrium price and quantity of pizza

4(a) What do you mean by Production Process? How it has changed in the era of Information and Communication Technology [5]

4(b) A Company wants to deposit money to create an R&D reserve. The company will get 15,00,000 every year for next 15 years for R&D. The reserve will grow at the rate of 12 per cent annually. Find out the single payment which should be made now. [5]

5(a) Environmental problems are macro level problems. Discuss the role of appropriate technology in this regard. Also suggest framework to impose taxes to control environmental hazards. [5]

5(b) A firm, Prime Manufacturing is planning to expand its production operation. It has identified three machines which are technologically capable to serve the purpose. The initial outlay and annual revenues with each of the machines are given below: [5]

	Initial Outlay (Rs.)	Annual revenue	Life (in years)
Machine I	Rs. 5,45,000	Rs. 2,50,000	15
Machine II	Rs. 6,14,000	Rs. 3,30,000	12
Machine III	Rs. 6,00,900	Rs. 3,50,000	10

If the rate of interest is 12%, which machine the company should opt for? Find out the result by Present Worth method.