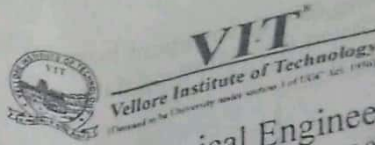




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School of Mechanical Engineering
CAT- I, Fall Semester 2019-20
B. Tech (Common to all branches)
Engineering and Management

Course Name: Industrial Engineering
Course Code : MEE1014
Slot : D1+TD1
Faculty Name: Dr. Soumen Pal

Duration: 90 min.
Max. Marks: 50
Class No: VL2019201001655

Answer all Questions

- 1) ABC Optics Ltd. is considering producing a new line of eyewear. After considering the costs of raw materials and the cost of some new equipment, the company estimates fixed costs to be Rs 40,000/- with a variable cost of Rs 45/- per unit produced.
- (a) If the selling price of each new product is set at Rs 100/-, how many units need to be produced and sold to break even?
- (b) If the selling price of the product is set at Rs 80/- per unit, the company expects to sell 2000 units. What would be the total contribution to profit from this product at this price?
- (c) ABC Optics estimates that if it offers the product at the original target price of Rs 100/- per unit, the company will sell about 1500 units. Will the pricing strategy of Rs 100/- per unit or Rs 80/- per unit yield a higher contribution to profit? [10]

Course Outcome = 2

- 2) Last week employees at ABC Ltd. produced 46 chairs after working a total of 200 hours. Of the 46 chairs produced, 12 were damaged due to a problem with the new sanding machine. The damaged chairs can be discounted and sold for Rs 25 each. The undamaged chairs are sold to a department store retail chain for Rs 70 each. What was the labour productivity ratio for last week? If labour productivity was Rs 15 in sales per hour the previous week, what was the change in labour productivity? [10]

Course Outcome = 3

- 3) A cosmetics company uses exponential smoothing with trend to forecast monthly sales of its special face cream. At the end of November, the company wants to forecast sales for December. The trend through October has been 10 additional boxes sold per month. Average sales have been 60 boxes per month. The demand for November was 68 boxes. The company uses $\alpha = 0.20$ and $\beta = 0.10$.
- a) Find a forecast including trend for the month of December.
- b) If the demand for December was 70 boxes, find forecast including trend for the month of January next year.

[10]
Course Outcome = 1

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- 4) The number of patients coming to a government hospital has been increasing steadily over the past eight months. Given the following data, use a linear trend line to forecast attendance for months 9 and 10.

Month	Clinic Attendance (in thousands)
1	3.4
2	3.9
3	4.5
4	5.0
5	5.8
6	5.9
7	6.5
8	6.7

[10]

Course Outcome = 1

- 5) With examples explain which goods are substitutes and which are complimentary. What are the advantages and disadvantages of partial productivity measures in a company which provides mobile phone and data services to customers? [10]

Course Outcome = 3

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