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Daffodil International University

Faculty of Business & Entrepreneurship
Department of Business Administration
Program: BBA

Semester: Summer-25
Time: 2 Hours
Course Code: 0541-122
Section: All

Examination: Final
Full Marks: 40
Course Title: Business Mathematics
Teachers' Initial: SAS, AA

Answer the followings questions

1. A workshop makes two types of chairs: wooden chairs and plastic chairs. Making one wooden chair takes 20 minutes and costs $8. Making one plastic chair takes 10 minutes and costs $5. If the workshop has 2500 minutes of labor and a budget of $1200, Identify the number of each type of chair can be made. — CLO 2, Level-3 — 5

2. The total cost C of producing q units of a product is given by, $C(q) = 60q + 40{,}000$ and if the selling price per unit is $90, answer the following when 1500 units are made and sold: — CLO 2, Level -3 — 3

   a) Estimate the variable cost.
   b) Evaluate the average cost per unit.
   c) Determine the total revenue.

   d) If because of a strike, the most the company can produce is 500 units, should it shut down? Analyze your explanation using profit function. — CLO 3, Level-4 — 2

3. A boutique speaker maker finds that producing 120 speakers cost $28,000, and producing 180 speakers cost $34,000. Each speaker is sold for $200. Using q for the number of speakers: — CLO 2, Level-3 — 5

   a) Develop the Revenue R(q), Cost C(q), and Profit P(q) functions.
   b) Determine the break-even quantity.
   c) Identify the total cost if 250 speakers are made.
   d) Construct the break-even chart.

4. a) Show the linear equation $3y - 2x = 24$ in slope intercept form. — CLO 1, Level-2 — 2

   b) Explain the break-even point with a break-even chart. — 3

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5.	A small bakery chain plans to expand by opening a new branch in 10 years. To fund the expansion, they want to accumulate \$20,000 by making an equal deposit at the end of every 6-month period into an account that pays 8% annual interest, compounded semi-annually. Identify the amount should deposit at the end of each 6-month period to have \$20,000 in 10 years. Also choose the total paid amount and total interest earned by this investment.	CLO 2 Level-3	4
6.	Breezy Bikes, a custom bicycle shop, has fixed costs of \$25,000 per year. Margin is to be 40% on retail. Extra variable expenses (marketing, delivery, etc.) are \$0.15 per dollar of sales. a) Build Revenue, Cost, and Profit functions using s for sales volume. b) Identify the break-even sales. c) Calculate net profit if sales are \$90,000.	CLO 2 Level- 3	5
7.	Determine Z_{max} graphically, if $Z = 3x + 5y - 2$ Subject to, $x + 2y \geq 18$ $3x + 3y \leq 36$ $x, y \geq 0$	CLO 2 Level-3	5
8.	A student-run catering business is preparing Mini Pizzas (P) and Fruit Bowls (F) for a campus event. A Mini Pizza sells for \$10 and costs \$5 to make. A Fruit Bowl sells for \$6 and costs \$3 to make. Preparing one mini pizza takes 6 minutes in the Kitchen and 4 minutes at the Serving Table. Preparing one fruit bowl takes 14 minutes in the Kitchen and 2 minutes at the Serving Table. The Kitchen will be available for no more than 84 minutes, and the Serving Table will be available for no more than 34 minutes. Construct the LP model. And solve this for selecting of each item should be prepared to maximize profit and also choose the maximum profit.	CLO 2 Level-3	6