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Daffodil International University

Faculty of Science & Information Technology
Department of Information Technology & Management (ITM)
Midterm Examination, Spring 2026
Course Code: MATH101, Course Title: Business Mathematics
Section: A (13th Batch) Teacher: BCD

Time: 01:30 Hrs **Marks: 25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1	*a)*	**Interpret** the knowledge of complex conjugate. Determine the values of a and b if $2a+3b = Z_1\bar{Z}_2^{\,2} + Z_1^{\,2}Z_2$ where $Z_1 = 2-\sqrt{3}\,i$ and $Z_2 = \frac{1}{2}+\frac{\sqrt{3}}{2}i$	1+4=5	CLO1 Level -1
	b)	Use the concept of Gauss elimination method to evaluate the values of the variables of the system of linear equations: $3x_1 - x_2 + 2x_3 = 1$, $x_1 + 2x_2 - x_3 = 2$, $x_1 - x_2 + 3x_3 = -1$	4	CLO1 Level -3
2	*a)*	Sum of \$500 are deposited in an account at the end of each 6-month period for 25 years. Find the amount in the account at the time of final deposit if the interest is 6% compounded semiannually.	3	CLO2 Level - 4
	b)	A Tk. 100 Lac condominium is to be purchased by paying TK. 20 Lac in cash and Tk. 80 Lac mortgage for 20 years at 9 percent compounded monthly. (a) **Determine** the monthly payment of the mortgage. (b) What will be total amount of the interest paid?	4+1=5	
3		An IT company wants to maximize its profit by producing two products smart phone and smart watch. Each smart phone sells for \$30 and cost \$25 to make, while each smart watch sells \$20 and cost \$17 to make. Each smart phone must be processed on two machines: smart phone requires 4 hours on machine A and 2 hours on machine B, whereas smart watch requires 10 hours on machine A and 3 hours on machine B. In the next week, machine A will be free for no more than 40 hours and machine B for no more than 15 hours. **Demonstrate** the system into a mathematical model and determine the number of smart phone and smart watch to be made in the next week for the company to maximize its profits and what will be the total profit?	1+7=8	CLO3 Level - 5