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Daffodil International University

Faculty of Business & Entrepreneurship
Department of Finance & Banking
Program: BBA in F&B

Semester: Fall-2026
Time: 1 Hour and 30 Minutes
Course Code: 0541-201
Section: 03 (A, B)

Examination: Mid-term
Full Marks: 25
Course Title: Business Mathematics
Teachers' Initial: AA

Answer the followings questions:

1.	(a)	A shop owner borrows Tk. 120,000 from a bank to renovate his store. The bank charges interest at an annual rate of 10% on the original loan amount. If he repays a total of Tk. 156,000, including both principal and interest, identify the time period (in months) for which the loan was taken.	2.5	CLO 2 Level-3
	(b)	An event planner is designing a triangular stage for a cultural program. The three vertices of the stage are located at the points $A(2,-3), B(8,3)$, and $C(x,9)$ on a coordinate map, where all coordinates are measured in meters. The stage must have an area of exactly 18 square meters. Solve the value of (x) that make the area of the triangle equal to 18 square meters.	2.5	
2.	(a)	Explain the characteristics of simple interest and compound interest. Plot x and y axis and show the point $(-4,3)$.	3	CLO 1 Level-2
	(b)	A drone is used to measure the distance between two locations in a field. The two points are $(x,-2)$ and $(4,x)$. The distance between these two points is 6 units. Solve the value(s) of x.	2	CLO 2 Level-3
3.	(a)	If $x = \log_{2a} a,\ y = \log_{3a} 2a,\ z = \log_{4a} 3a,$ then verify that, $xyz + 1 = 2yz$	2.5	CLO 2 Level-3
	(b)	Solve the following equation: $\log_{10}(x-3) + \log_{10} x = 1$	2.5	

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4.	(a)	A small business owner invests some capital into a long-term savings plan. She wants her investment to triple in value over 10 years. If the interest is compounded quarterly, identify the interest rate must the bank offer for her money to triple in 10 years.	2.5	CLO 2 Level-3
	(b)	A university is planning to establish a laboratory equipment replacement fund to ensure that outdated instruments can be upgraded regularly. The university decides to deposit a fixed amount at the end of every three months into a reserve account. The goal is to accumulate a total of \$150,000 after 6 years. The account earns 6% interest compounded quarterly. Choose the amount that must be deposited each quarter to reach the target fund.	2.5	
5.	(a)	A landscape architect is designing a triangular flower bed in a public park. The three vertices of the flower bed are located at the points $A(-2,3), B(4,7)$, and $C(6,1)$ on a coordinate plane. Using the distance formula, examine the type of triangle based on its side lengths.	3	CLO 3 Level-4
	(b)	If $a^2 + b^2 = 47ab$, show that $2\log(a+b) = \log a + \log b + 2\log 7$	2	CLO 2 Level-3