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Daffodil International University

Class Test

Student ID : **Program :** **– semester : Summer- 2025**

Course Code : MAT101 **Course Title : Mathematics I** **Section : 69-A** **Date : 26/05/25**

Class Test No. : 01 **Signature of the Course Teacher :** **Time: 30 minutes**

Q1.

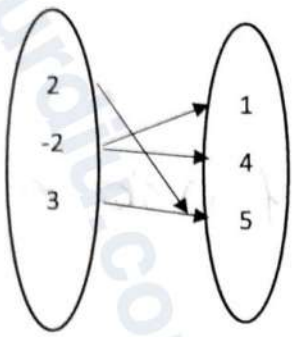
i. If

$$R=\{(1,2),\ (2,3),\ (1,3)\}$$
$$S=\{(4,7),\ (4,8),\ (5,9),(7,11)\}$$
$$T=\{(3,10),\ (-3,10),\ (5,26),(6,37)\}$$

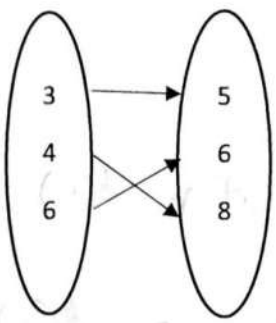
Which relation is a function and why? 2

ii. Which Relation is an Injective, Surjective, and Bijective Function and why:

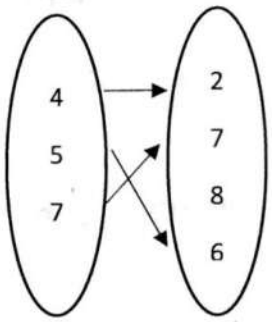
a) A B



b) A B



c) A B



3

Q2. State the factor theorem .Find the roots of the equation $x^4-16x^3+86x^2-176x+105=0$

By using remainder theorem. 5

Q3. Examine the Differentiability of the following function at the point $x=\frac{\pi}{2}$ 5

$$f(x)=\begin{cases}1; x<0\\ 1+\sin x; 0\le x<\frac{\pi}{2}\\ 2+\left(x-\frac{\pi}{2}\right)^2; x\ge\frac{\pi}{2}\end{cases}$$

Start from here