

THE OPEN UNIVERSITY OF SRI LANKA
 B.SC. DEGREE PROGRAMME: LEVEL 05
 DEPARTMENT OF COMPUTER SCIENCE
 CSU 5304 – MATHEMATICS FOR COMPUTING
 NO BOOK TEST – 02 (NBT-02) 2017/18



DURATION: One Hour Only (1 Hour)

Date : 28th July 2018

Time: 10.30am-11.30am

Answer All Questions

1.

- i. Define the term “**Function**” in the context of Mathematics.
- ii. Given bellow are coordinates of a function/ graph.
 (45.6, 65.5), (48.2, 68.0), (41.8, 62.2), (46.0, 66.0), (50.4,70.0)
 - (a) Write the two sets: domain and image.
 - (b) Give any set that you think is a suitable **codomain** for the above function/graph.

iii. Given that

$$g(t) = \begin{cases} 3t^2 + 4 & \text{if } t \leq -4 \\ 10 & \text{if } -4 < t \leq 15 \\ 1 - 6t & \text{if } t > 15 \end{cases}$$

Evaluate each of the following functions.

- (a) $g(-6)$
 - (b) $g(-4)$
 - (c) $g(1)$
 - (d) $g(21)$
 - (e) $g(15)$
- iv. If $f(x) = x^2 - 4x + 2$ and $g(x) = 3x - 7$
 Where $x \in \mathbb{R}$
 Find $f \circ g(x)$

2. i. What is meant by:

- (a) A rectangular matrix
- (b) Symmetric matrix
- (c) Row vector
- (d) Column vector
- (e) Orthogonal matrix

ii. What are the conditions for:

- (a) Addition of two matrices
- (b) Multiplication of two matrices

iii. Two matrices P and Q are given by:

$$P = \begin{bmatrix} x & 2 \\ -5 & -1 \end{bmatrix} \quad \text{and} \quad Q = \begin{bmatrix} 2 & -3 \\ 4 & 1 \end{bmatrix}; \quad x \in \mathbb{R}$$

Given that the determinant of P is 2.

Obtain:

- (a) The value of x
- (b) PQ^T (where Q^T is the transpose of Q)

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