

The Open University of Sri Lanka

B.Sc. Degree Programme: Level 05

Department of Computer Science

CSU 5304 – Mathematics for Computing

No Book Test-2 (NBT-2) 2019/2020

Duration: ONE HOUR ONLY (1 HOUR)



Date: 03rd November 2019

Time: 10.30am -11.30am

Answer ALL Questions

(01) (i) Give the definition of a “function” in the context of mathematics.

(ii) h is a function defined by

$$h(x) = \begin{cases} 2x+4 & ; x \leq 2 \\ 2x-1 & ; x > 2 \end{cases}$$

Find the values of $h(0)$, $h(2)$ and $h(4)$.

(iii) The functions f and g are defined such that :

$$f: \mathbb{R} \rightarrow \mathbb{R} \quad \text{and} \quad g: \mathbb{R} \rightarrow \mathbb{R}$$

$$f: t \rightarrow 4t-1 \quad \text{and} \quad g: x \rightarrow kx^2 \text{ where } k \text{ is a constant.}$$

(a) Find the composite function $f \circ g(x)$

(b) Given that $f \circ g(2) = 12$ what is the value of k?

(iv) A function is given by $f(x) = \frac{x-1}{x+1}$; $x \in \mathbb{R}$

$$\text{Prove that } f\left(\frac{1}{x}\right) = -f(x)$$

(v) A function k is such that $k(x) = -4x-1$; $x \in \mathbb{R}$

Find the inverse function of k and also give the domain, image set, and the

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(02) Given that:

$$A = \begin{bmatrix} -1 & 23 & 10 \\ 0 & -2 & -11 \end{bmatrix}, \quad B = \begin{bmatrix} -6 & 2 & 10 \\ 3 & -3 & 4 \\ -5 & -11 & 9 \\ 1 & -1 & 9 \end{bmatrix}, \quad C = [-3 \ 2 \ 9 \ -5]$$

$$D = \begin{bmatrix} -2 & 6 \\ -5 & 2 \end{bmatrix}, \quad E = [3], \quad F = \begin{bmatrix} 3 \\ 5 \\ 11 \\ 7 \end{bmatrix}, \quad G = \begin{bmatrix} -6 & -4 & 23 \\ -4 & -3 & 4 \\ 23 & 4 & 9 \end{bmatrix}$$

- Give the dimension of each of the matrix given above.
- Which matrices are square matrices? Give the reason for your answer.
- Find the transpose of the matrices A , C , E ,G .
- Which matrices are symmetric? Justify your answer.
- Which are row vectors and column vectors?

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