00118

The Open University of Sri Lanka

B.Sc. Degree Programme

Department of Computer Science

CSU 5304 – Mathematics for computing

Continuous Assessment Test-02 (CAT-02) 2023/24

Duration: One Hour Only (1 Hour)

Date: 18.08.2023 Time: 1.00 p.m. – 2.00 p.m.

Answer All Questions.

(01) (i) Write down the conditions to be satisfied in order to perform the following matrix operations.

(a) Additions of two matrices.

(b) Multiplication of two matrices.

(c) Finding the determinant of a matrix.

(ii) Given that $A = \begin{bmatrix} 0 & 1 & -1 \\ 4 & 3 & -4 \\ 3 & 3 & -4 \end{bmatrix}$ verify that $A^2 = I$

3×3

Where I is the Identity matrix of the same size. Hence find A^{-1}.

(iii) Find the determinant of $\begin{bmatrix} 2 & -3 & 5 \\ -3 & 6 & 2 \\ 1 & -2 & 5 \end{bmatrix}$

3×3

(02) (i) Describe the principle of Mathematical Induction for a statement $P(n)$, where $n \in \mathbb{N}$.

(ii) Use Mathematical Induction to prove: $1^2 + 2^2 + 3^2 + \cdots + n^2 = n(n+1)(2n+1)/6$