THE OPEN UNIVERSITY OF SRI LANKA

B.Sc. DEGREE PROGRAMME: **Level 05**

DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

NO BOOK TEST- **02 (NBT- 02) - 2015/2016**

CPU 3140: MATHEMATICS FOR COMPUTING

DURATION: **ONE HOUR ONLY (1 HOUR)**

Date: **08th MAY 2016** Time: **10.30 am -11.30 am**

Answer **ALL** Questions.

(01).

I. $\mathbf{A}=\begin{pmatrix} 6 & -2 \\ -4 & 1 \end{pmatrix}$ and $\mathbf{I}$ is a 2×2 identity matrix.

a) Prove that $A^2 = 7A + 2I$

b) Hence, show that $A^{-1} = \frac{1}{2}(A - 7I)$.

II. $\mathbf{X} = \begin{pmatrix} 1 & a \\ 3 & 2 \end{pmatrix}$,where **"a"** is a constant.

Find the value of **"a"** for which the matrix is singular.

III. $\mathbf{B} = \begin{bmatrix} 5 & 2 & 3 \\ 4 & 7 & 1 \\ 8 & 5 & 9 \end{bmatrix}$ is "**B**" a symmetric matrix?

If your answer is "NO" give a justification.

(02).

I. What are the main steps that you follow in Mathematical Induction?

II. Use Mathematical Induction to prove $\mathbf{1^2 + 2^2 + 3^2 + \ldots\ldots + n^2 = n(n+1)(2n+1)/6}$ for all positive integers n.