The Open University of Sri Lanka
Foundation Course in Science – Level 02
Closed Book Test (CBT) 2006/2007
MAF 2301/MAE 2301 - Pure Mathematics

Duration :- One and Half Hours.

Date :- 11-12-2006. **Time:- 1.30 p.m. – 3.00 p.m.**

Answer All Questions.

01. $A=\begin{pmatrix}0 & 2\\ 1 & -1\end{pmatrix}$ and $B=\begin{pmatrix}-2 & 3\\ 1 & 0\end{pmatrix}$

Find (i) $(A+B)^2$ (ii) $A^2+AB+BA+B^2$

Hence show that $(A+B)^2=A^2+AB+BA+B^2$.

02. Prove that

(i)

$$\begin{vmatrix}1 & 1 & 1\\ a & b & c\\ bc & ca & ab\end{vmatrix}=(a-b)(b-c)(c-a).$$

(ii) Solve the equations by Carmens's rule

$$2x+y-z=-1$$
$$3x-2y+z=7$$
$$x+2y+2z=3$$

03. (i) Prove that the point $(at^2, 2at)$ lies on the parabola $y^2=4ax$ and hence find the equation to the normal at that point.

(ii) $P(t^2, 2t)$ is any point on the parabola $y^2=4x$. If the normal at P meets the x axis at Q, find the co-ordinate of the midpoint of PQ.