

## REVIEW QUESTIONS

### Module 3

1. Define the concept of a matrix and the related concepts of **type** and **order** of a matrix.

**The following matrices are given in connection with Questions 2 and 3 below:**

$$A = \begin{pmatrix} 2 & 1 \\ 6 & 3 \end{pmatrix}; \quad B = \begin{pmatrix} 1 & -1 & 2 \\ -2 & 3 & -1 \end{pmatrix}; \quad C = \begin{pmatrix} 2 & 3 \\ 2 & 1 \end{pmatrix};$$

$$D = \begin{pmatrix} 2 & -3 & 1 \\ 3 & 1 & -2 \\ -1 & 2 & 3 \end{pmatrix}.$$

2. Perform the following matrix operations if they are allowable
  - (a)  $7A$
  - (b)  $AB$
  - (c)  $AC$
  - (d)  $CA$
  - (e)  $BA$
  - (5)  $\frac{A}{C}$ .
3. Calculate  $\det(A)$ ;  $\det(C)$ ;  $\det(D)$ 
  - (a) Which of the matrices are singular and which ones are nonsingular?
  - (b) Find the inverse matrix of  $A$  and  $C$ , if they exist, and verify the result obtained.
4. Reformulate the following system of simultaneous linear equations in the matrix-vector form and verify that the solution vector is:  $[1, -1, -2]$

$$\begin{aligned}x_1 + 3x_2 - 2x_3 &= 2 \\2x_1 + 6x_2 - 5x_3 &= 6 \\x_1 + 2x_2 + 3x_3 &= -7\end{aligned}$$