ASSIGNMENT-1

Answer all questions. $5 \times 4 = 20$

1. *Find the order of the permutation*

$$\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 4 & 6 & 3 & 5 & 1 & 2 \end{pmatrix}$$

2. *Show that the order of a permutation on a finite set is the l.c.m. of the lengths of the disjoint cycles.*

3. *Let* $s = \{1,2,3,4\}$ *and*

$$f = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 1 & 3 & 4 & 2 \end{pmatrix}, g = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 3 & 4 & 1 \end{pmatrix}, h = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 1 & 3 & 4 & 2 \end{pmatrix}$$

Then show that $f(gh) = (fg)h$

4. *Examine whether the composition o on* $M_2(R)$ *defined by*

$$AoB = \frac{1}{2}(AB - BA), A, B \in M_2(R)$$

is (i) commutative, (ii) associative.

5. *Write the composition table for the binary operation multiplication modulo 10* $(\times_{10})$ *on the set* $\{2,4,6,8\}$ *and hence check the operation is commutative or not.*