SYBSc SEMESTER IV
MATHS II
SAMPLE QUESTIONS

1. Let Gbe a group and $a, b, c \in G$then the solution of the equations $axb^{-1} = c$ and $a^{-1}y^{-1}b^{-1} = c$ are

(a) $x = a^{-1}c^{-1}b, y = a^{-1}c^{-1}b^{-1}$ (b) $x = a^{-1}c \quad b, y = a^{-1}c^{-1}b^{-1}$
(c) $x = b^{-1}c^{-1}a^{-1}, y = a^{-1}c^{-1}b^{-1}$ (d) $x = a^{-1}c \quad b, y = b^{-1}c^{-1}a^{-1}$

2. Consider the set G=$\{\overline{5}, \overline{15}, \overline{25}\ , \overline{35}\}$under multiplication of residue classes modulo 40. Then
(a) G is not a group as $\overline{1} \notin G$ (b) G is a group with $\overline{25}$ as identity
(c) G is a group with $\overline{5}$ as identity (d) None of these

3. For what value of $n, D_n = S_n$
(a) n=3 (b) n=4
(c) n=5 (d) No such n exists

4. Let G be a group having elements of order 1,2,3,4,5,6. The minimal possible order G of is

(a) 100 (b) 30
(c) 60 (d) 1

5. Let G be a non-Abelian group $Z(G) = \{\, x \in G /\ ax = xa, \forall a \in G\}$then
(a) Z(G)={e} (b) Z(G)≠G and Z(G) is abelian
(c) Z(G)=G (d) Z(G) is non-abelian

6. Number of elements of order 5 in Z_{1000} is

(a) 1 (b) 4
(c) 5 (d) 200

7. Let G be a cyclic group of order n generated by ‘a ’ then $\langle a^r \rangle = \langle a^s \rangle$ implies

(a) (r,s)=1 (b) S=(n,r)
(c) (n,r)=(n,s) (d) $(r|(n,s))$

8. Let H be a subgroup of G and $a, b \in G$ If then $aH \neq bH$ then
(a) $aH \cap bH = \emptyset$ (b) $aH \cap bH \neq \emptyset$
(c) $aH \subset bH$ (d) $aH \supset bH$

9. Let H be a subgroup of G anda$\in G$. aH is a subgroup of G if and only if

(a) $a \notin H$ (b) $a \in H$
(c) $a^{-1} \notin H$ (d) None of these

10. If $G = \mathbb{Z}$ with addition and H$=\{0,\pm 3, \pm 6, \pm 9, \ldots\}$then which of the following is true

(a)	11+H= 17+H	(b)	11+H= 13+H
(c)	7+H=23+h	(d)	H=H+2