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Total No. of Questions : 08

M.Sc. (Mathematics) (2018 Batch) (Sem.–1)

ALGEBRA-I

Subject Code : MSM-101-18

M.Code : 75129

Time : 2 Hrs. Max. Marks : 35

INSTRUCTIONS TO CANDIDATES :

1. Attempt any FIVE question(s), each question carries 7 marks.

1. a) Let G be a Group such that (ab)2 = a2b2 for all a, b □ G show that G is abelian.

   b) If a,b are any two elements in group G, Show that ab and ba have the same order.

2. a) Define normal series of group G.

   b) State all Sylow theorems.

3. a) State and prove third isomorphism theorem.

   b) Prove that set Aut(G) of all automorphisms of a Group G is a group under composition of mapping and In(G) □□Aut(G).

4. Prove that alternating group An is simple for n>4.

5. a) State and prove Jordan – holder's theorem.

   b) Prove that every permutation can be expressed as a product of transpositions.

6. a) In a non zero commutative ring with unity. Prove that ideal M is maximal if and only if R/M is a field.

   b) If R is a Ring with unity. Show that each maximal ideal is prime. But the converse in general, is not true.

7. State and prove fundamental theorem of homomorphism.

8. State and prove fundamental theorem on finitely generated abelian groups.

Note: Any student found attempting answer sheet from any other person(s), using incriminating material or involved in any wrong activity reported by evaluator shall be treated under UMC provisions.

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answer sheet and original answer sheet, shall be covered under UMC provisions.