Sessional Examination 2021

BSc 3rd Semester

Subject: Mathematics (H)

Paper MAT-HC-3026: Group Theory

Marks: 30, Time 1 hour

1. Answer the following questions
   (i) What is the order of an element of a group? 1
   (ii) Give an example of a finite group. 1
   (iii) What is the order of a symmetric group p_n? 1
   (iv) Give an example that union of two subgroups may not be a subgroup. 1
   (v) Define cyclic group. 1
2. Prove that every cyclic group is abelian. 2
3. If inverse of a is a^{-1} then prove that inverse of a^{-1} is a. 2
4. If a and b are two elements of a group G then show that the equation $ax = b$ have unique solution. 3
5. Prove that intersection of two subgroups is also a subgroup. 3
6. State and proof the Farmat's theorem. 5
7. Show that two right cosets are either disjoint or identical. 5
8. Prove that the order of an element of group is the same as that of its inverse. 5

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