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DMM-3347

Second Year B. Sc. (Sem. IV) Examination

March / April - 2016

Group of Symmetries - II

(EG Mathematics)

(Old Course)

Time : **2** Hours] [Total Marks : **50**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ SECOND YEAR B. Sc. (SEM. 4)

Name of the Subject :

☛ GROUP OF SYMMETRICS - 2 (OLD)

☛ Subject Code No. : 3 3 4 7 ☛ Section No. (1, 2,.....) : NIL

Seat No. :

Student's Signature

(2) All questions are compulsory.

(3) Figures to the right indicate marks of the corresponding question.

1 Check the validity of the following statements. **5**

(1) PCL_3 is a planer molecule.

(2) The group of symmetries of a square is an abelian group of order 6.

(3) The group of symmetries of trans N_2-F_2 is a cyclic group.

(4) The group of symmetries of a H_2O is isomorphic to that of a rectangle.

(5) The multiplicative group of all forth roots of unity are isomorphic to group of symmetries of a rectangle.

2 (a) Explain by drawing figures, different types of symmetries of a square. **8**

OR

2 (a) Explain by drawing figures, different types of symmetries of an equilateral triangle. **8**

(b) Attempt any **one** : **7**

(1) Show that the set of all possible symmetries of an isosceles triangle is a group under operation of composition of symmetries. Is it a cyclic group?

(2) Show that the symmetries of a rectangle is a group under composition of symmetry.

3 (a) Show that the set of all possible symmetries of trans N_2-F_2 is a group under composition of symmetry. **8**

OR

3 (a) Explain all possible symmetries of a molecule NH_3. **8**

(b) Attempt any one : **7**

(1) Check whether the multiplicative group of the forth-roots of unity is isomorphic to group of symmetries of a rectangle or not.

(2) Show that the set of all possible symmetries of trans H_2S is a group under composition of symmetry.

4 (a) Show that the group of symmetries of a rectangle is isomorphic to that of trans N_2-F_2. **8**

OR

4 (a) Check whether the multiplicative group G = {1,3,5,7} with X_8 is isomorphic to group of symmetries of a rectangle. **8**

(b) Attempt any **one** : **7**

(1) Show that the multiplicative group of the square-roots of unity is isomorphic to group of symmetries of an isosceles triangle.

(2) Explain Isomorphism of two groups with illustration.
