R A N - 7 0 2 9

RAN-7029

S.Y.B.Sc.(Semester-IV) Examination

March / April - 2019

Group of Symmetries -II (EG-Mathematics) (l)(old)

(Old or New to be mentioned where necessary)

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

સૂચના : / Instructions

(1)

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

Name of the Examination:

☛ **S.Y.B.Sc.(Semester-IV)**

Name of the Subject :

☛ **Group of Symmetries -II (EG-Mathematics)**

Subject Code No.: **7 0 2 9**

Seat No.: | | | | | | |

Student's Signature

(2) All questions are compulsory.

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

Q:1 Check the validity of the following statements. (Any six) **06**

1. The order of group of symmetries of a square is same as that of $CHCL_3$.
2. The group of symmetries of trans $N_2 - F_2$ is isomorphic to that of a square.
3. There are four possible different symmetry operations of molecule PCL_3.
4. A group G of order 4 is a cyclic group if all elements of G are of order less than 3.
5. The group of symmetries of any triangle is an abelian group group.
6. $H_2 - O$ is a planer molecule.
7. The group of symmetries of H_2O_2 is isomorphic to that of a square.
8. The group of symmetries of a rectangle is a cyclic group of order six.

Q:2. Attempt any Two **14**

1. Show that the symmetries of an isocelestriangle is a group under composition of symmetry. Is it a cyclic group?
2. Obtain group table for the symmetries of a rectangle. Is it abelian group? Find order of each element.
3. Explain all possible symmetries of an equilateral triangle.

Q:3. Attempt any Two. **16**

1. Show that the set of all possible symmetries of $H_2 - O_2$ is a group under composition of symmetry.
2. Explain all possible symmetries of a molecule NH_3.
3. Show that the multiplicative group of the square-roots of unity is isomorphic to group of symmetries of an isosceles triangle.

Q:4. Attempt any Two. **14**

1. Check whether the multiplicative group G = {1, 3, 5, 7} with X_8 is isomorphic to group of symmetries of a rectangle .
2. Show that the group of symmetries of an equilateral triangle is isomorphic to that of NH_3.
3. Show that the group of symmetries of a rectangle is isomorphic to that of H_2O.

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