

Time : 3 Hours

Total Marks : 300

### General Instructions :

- There are three subjects in the question paper consisting of Chemistry Q. no. 1 to 6.
- This Paper is divided into two sections:
  - Section A Consists of 20 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4), out of which ONLY ONE is correct.
  - Section B consist of 10 questions, **Numerical Value Type Questions** - In Section B, attempt any five questions out of 10. The answer to each question is a **NUMERICAL VALUE**. For each question, enter the correct numerical value (in decimal notation, truncated/rounded-off to the second decimal place; e.g. 06.25, 07.00, -00.33, -00.30, 30.27, -27.30) using the mouse and the on-screen virtual numeric keypad in the place designated to enter the answer.
- There will be only one correct choice in the given four choices in Section A. For each question 4 marks will be awarded for correct choice, 1 mark will be deducted for incorrect choice for Section A questions and zero mark will be awarded for not attempted question.
- For Section B questions, 4 marks will be awarded for correct answer and zero for unattempted and incorrect answer.

## Chemistry

### Section A

**Q. 1.** The correct statement regarding nucleophilic substitution reaction in a chiral alkyl halide is:

- Racemisation occurs in  $S_N1$  reaction and inversion occurs in  $S_N2$  reaction.
- Retention occurs in  $S_N1$  reaction and inversion occurs in  $S_N2$  reaction.
- Racemisation occurs in  $S_N1$  reaction and retention occurs in  $S_N2$  reaction.
- Racemisation occurs in both  $S_N1$  and  $S_N2$  reactions.

**Q. 2.** Given below are two statement:

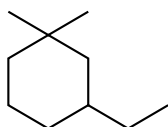
**Statement (I):** The 4f and 5f series of elements are placed separately in the periodic table to preserve the principle of classification.

**Statement (II):** s-block element can be found in pure form in nature.

In the light of the above statements, choose the most appropriate answer from the options given below:

- Statement I is false but Statement II is true
- Both Statement I and Statement II are false
- Both Statement I and Statement II are true
- Statement I is true but Statement II is false

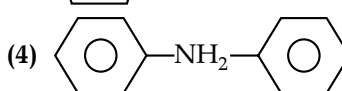
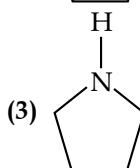
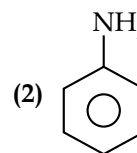
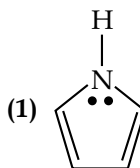
**Q. 3.** IUPAC name of following compound (P) is:



(P)

- 1-Ethyl-3, 3-dimethylcyclohexane
- 1-Ethyl-5, 5-dimethylcyclohexane
- 1, 1-Dimethyl-3-ethylcyclohexane
- 3-Ethyl-1, 1-dimethylcyclohexane

**Q. 4.** Which of the following is strongest Bronsted base ?



**Q. 5.** NaCl reacts with conc.  $H_2SO_4$  and  $K_2Cr_2O_7$  to give reddish fumes (B), which react with NaOH to give yellow solution (C). (B) and (C) respectively are:

- $CrO_2Cl_2$ ,  $KHSO_4$
- $Na_2CrO_4$ ,  $CrO_2Cl_2$
- $CrO_2Cl_2$ ,  $Na_2CrO_4$
- $CrO_2Cl_2$ ,  $Na_2Cr_2O_7$

**PURCHASE**

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