

**B.Sc. Semester - 4 (NEP-2020) Examination****March/April-2025****CHE: Intermediate Chemistry-209 (Major-9)****Time: 2:00 Hours****Marks: 50****Instructions:**

1. All questions are compulsory.
  2. Figures to the right indicate marks.
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Que-1 Answer the following (Any Two) (10)

1. Explain in detail: Particle in one dimensional box.
2. Name the raw materials used in soap and describe the importance of each.
3. Derive the equation of wave function and equation of energy for particle in three-dimensional box.

Que-2 Answer the following (Any Two) (10)

1. Prove the constitution of Coniine
2. Explain the Isoprene rule with two examples
3. Give the principle, mechanism and applications of Arndt Eistert reaction.

Que-3 Answer the following (Any Two) (10)

1. Derive equation of rate constant for second order reaction. (When concentration is same)
2. Explain: mathematical form of third law of thermodynamics.
3. Describe activated complex theory.

Que-4 Answer the following (Any Two) (10)

1. Explain the concept of chemical potential and derive Gibbs Duhem question.
2. Give the reason: pyridine is more basic than pyrrole but less basic than aliphatic amine.
3. What is toxicity? Discuss the toxic effect of Mercury.

Que-5 Answer the following (Any Two) (10)

1. Find the values of the normalized wave function for a particle moving in one dimensional box of length 'a' at  $x=0$ ,  $a/2$  and  $a/4$  for energy level  $n=1$  and  $n=2$ .
2. Give the principle, mechanism and applications of Curtis rearrangement.
3. Explain: Residual entropy with example.
4. Explain structure and aromaticity of pyrrole.

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