21BSC4C4CHL

B.Sc. IV Semester Degree Examination, Sept./Oct. - 2024
CHEMISTRY
DSC-IV : Inorganic and Physical Chemistry
(NEP)

Time : 2 Hours   Maximum Marks : 60

Note : *Answer **all** sections.*

SECTION - A

1. Answer the following sub-questions. Each sub-question carries **one** mark.   **10x1=10**

    (a)   What is ionic bond ?

    (b)   Give Kapastinskii equation.

    (c)   State Bent's rule.

    (d)   What is the hybridisation of H_2O molecule ?

    (e)   What are bonding molecular orbitals ?

    (f)   What are semiconductors ?

    (g)   What is bond order ?

    (h)   Define enthalpy of a system.

    (i)   What is activation energy ?

    (j)   Define molar conductance.

SECTION - B

Answer **any four** of the following questions. Each question carries **five** marks.

2. Calculate the radius ratio value for square planar geometry.   **4x5=20**

3. Explain dsp^2 hybridisation with examples.

4. List out the rules for LCAO method for the formation of molecular orbitals.

5. Discuss the general properties of metals.

6. Write a note on Joule-Thomson expansion and Joule-Thomson Coefficient.

7. Explain Arrhenius theory of electrolytic dissociation.

SECTION - C

Answer **any three** of the following questions. Each question carries **ten** marks.

3x10=30

8. (a) Discuss the structure of ionic crystals of the type AX and AX_2 with example.   **6**

   (b) Write a note on applications of Fajan's rule.   **4**

9. (a) Discuss the postulates of Sidgwick - Powell theory.   **6**

   (b) Explain sp^3d^2 hybridisation with example.   **4**

10. (a) Draw molecular energy level diagram for O_2^- ion calculate bond order and predict the magnetic behaviour.   **6**

   (b) Draw the molecular orbital diagram for s-s and s-p combination of orbitals.   **4**

11. (a) Explain the intermediate compound theory for catalysis.   **6**

   (b) Calculate the pressure-volume work performed by a system during reversible isothermal expansion of 2 moles of an ideal gas from 2 litres to 10 litres at 20°C.   **4**

12. (a) State Kohlrausch's Law. Discuss the application of Kohlrausch's Law.   **6**

   (b) Write a note on experimental determination of kinetics of inversion of cane sugar by potentiometric method.   **4**

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