Seat Number

0052

खडक - 007

CHEMISTRY PAPER – I (NEW) : CHE - 241
Physical Chemistry & Inorganic Chemistry - II
(24135)

P. Pages : 2

Time : Two Hours

Max. Marks : 40

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Instructions to Candidates :
1. Do not write anything on question paper except Seat No.
2. Graph or diagram should be drawn with the black ink pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All questions are compulsory.
5. Programmable calculator are not allowed.
6. Figures to the right indicate full marks.

1. a) Multiple choice questions.   4

    i) The Gibb's free energy is given by.........
        a) G = H + TS   b) G = E + TS
        c) G = H – TS   d) G = H + A

    ii) The electrode at which oxidation take place is act as........
        a) Positive electrode
        b) Negative electrode
        c) Indicator electrode
        d) Null electrode

    iii) Most common oxidation state for Ln's is ....
        a) +4   b) +3
        c) +6   d) +2

    iv) He_2 molecule is not formed because........
        a) Nb = Na   b) Nb > Na
        c) Nb < Na   d) Nb – Na = + Ve

    b) Attempt **any two** of the following.   4
        i) Explain Gibb's free energy.
        ii) What are Lanthanides ? Why are they so called ?
        iii) Draw M.O. diagram of HCl and calculate B.O.

2.   Attempt **any two** of the following.   8

     i)   Explain the term Helmholtz free energy and give the physical significance of change in Helmholtz free energy.

     ii)   Give the construction and working of Weston standard cell.

     iii)   Name the Lanthanide elements and give their electronic configuration.

3.   a)   Answer **any one** of the following.   4

     i)   Three moles of an ideal gas are allowed to expands isothermally and reversibly at 300k from pressure 2.5 atm to 1.0 atm. Calculate the change in Gibb's free energy (R = 8.314 J dey^{-1} mole^{-1})

     ii)   Calculate emf of the cell.
       $^{\ominus}Zn/Zn^{+2}$ (a=0.1m) // Ag^{+} (a=0.05m) / Ag^{+}
       at 25 °C Given $E°zn(ox)=0.763$ v $E°Ag(ox)=-0.799$ v.

  b)   Answer **any one** of the following.   4
     i)   Discuss in brief about the various oxidation states of actinides.
     ii)   Give any four features of M. O. T.

4.   Answer **any two** of the following.   8

     i)   Explain the term Vapour pressure and discuss variation of Vapour pressure with temperature.

     ii)   Give the occurrence and uses of Lanthanides.

     iii)   Draw M.O. energy level diagram of NO molecule calculate Bond order and stablisation energy.

5.   a)   Answer **any one** of the following.   6

     i)   Describe the construction and working of standard hydrogen electrode. Give its disadvantages.

     ii)   Explain with the help of diagrams the formation of M.O.S by the combinations
       a) S–S Orbital   b) S–P Orbitals   c) P–P Orbitals

  b)   Define Reversible cell and irreversible cell.   2

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