

Exam.Code:0906
Sub. Code: 6672

1058
B.E. (Civil) Second Semester
CH-201: Applied Chemistry
(Common with CSE)

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

- I. Answer the following briefly:-
- Comment on the statement, "while U is a definite property, q and w are not definite properties."
 - Predict the number of unpaired electrons in the square planar $[\text{Pt}(\text{CN})_4]^{2-}$
 - Which molecule would absorb at the longest wavelength: 1,3-hexadiene or 1,4-hexadiene. Why?
 - Which of the following are Intensive properties: density, surface tension- volume, entropy. Justify your answer.
 - Draw and label the energy level diagram of a reaction with and without the catalyst.
 - Presence of acidic oxides, like CO_2 , SO_2 accelerates the corrosion. Justify the statement.
 - Why is standard hydrogen electrode called as primary reference electrode?
 - Why some of the fundamental vibrations are IR active while others are not?
 - Is $(-\text{CH}_2-\text{CHCl}-)_n$ a homopolymer or a copolymer?
 - Which electrolytic solution is used in hydrogen-oxygen fuel cell? (10x1)

UNIT - I

- II. a) Derive an expression for the maximum work done when n moles of an ideal gas are expanded isothermally and reversibly from volume V_1 to V_2 .
- b) An engine operating between 150°C and 25°C takes 500 J heat from a high temperature reservoir. Assuming that there are no frictional losses, calculate the work that can be done by this engine. (6,4)
- III. a) Define the following (i) activation energy (ii) catalyst inhibitor with an example (iii) catalyst promoter with an example.
- b) Derive Michaelis-Menten equation for an enzyme catalyzed reaction. (6,4)

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(2)

IV. a) Give the construction, working principle, and applications of Hydrogen-Oxygen fuel cells.

b) What are the differences between chemical and electrochemical corrosion. (6,4)

UNIT - II

V. a) Describe the classification of polymers on the basis of intermolecular forces in them.

b) In a polymer, there are 100 molecules of molecular weight 100, 200 molecules of molecular weight 1000 and 300 molecules of molecular weight 10,000. Find number average, weight average molecular weights and PDI. (6,4)

VI. a) Discuss the vibrational modes of molecules responsible for an IR spectrum.

b) Explain the difference between (i) allowed transition and forbidden transition (ii) chromophore and auxochrome (6,4)

VII. a) What is spectrochemical series? Explain the difference between strong field and weak field ligands taking suitable examples.

b) Crystal Field Splitting for tetrahedral complexes is less than octahedral complexes. Explain with the help of diagram and suitable examples. (6,4)

x-x-x

Time allc

NOTE: A

tv

I.

II.

III.

IV.

V.