



JK Lakshmipat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination, May 2016
B. Tech. I year, II Semester CH-201 (Backlog)

Roll No.....

CH201: ENGINEERING CHEMISTRY-II

Time: 3.00 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

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|-------------|--|-----------|
| Q.1 | Objective type (1 marks each) | 10 |
| | <ol style="list-style-type: none">i. Give the Dulong's formula to calculate the theoretical value of HCV and LCV of a fuel sample.ii. In Galvanizing we coat.....on iron.iii. Write the formula to Calculate % of C and % H in analysis of Coal.iv. Give the relation between rate constant and the temperature of reaction.v. Give the formula of Rust.vi. What is Unit cell?vii. Define order of reaction.viii. Write the Bragg's Equation.ix. Give the formula to calculate the rate constant of first order reaction and its half-life.x. Sodium metal crystalize in Body centered cubic lattice (BCC) with the cell edge ($a = 4.29 \text{ \AA}$), Calculate the radius of sodium atom. | |
| Q.2 | Short answer type questions (2.5 marks each) | 10 |
| | <ol style="list-style-type: none">i. Define the term HCV, of a fuel.ii. Explain the Proximate analysis of coal by formulas.iii. Define Conducting Polymer.iv. Calculate the distance between two parallel planes of a crystal which shows 'second order' reflection at an angle 30° with X-ray of wavelength $2 \times 10^{-10} \text{ m}$. | |
| Q.3A | Explain the structural features and applications of Graphite with diagram. | 5 |
| Q.3B | Write short notes on (i) PASSIVITY and (ii) PITTING Corrosion. | 5 |
| Q.4A | Draw the neat diagrams of SCC, FCC and BCC unit cell and calculate the number of atoms per unit cell. | 5 |
| Q.4B | Explain in detail the Characteristics of a good fuel. | 5 |

- Q.5A A BCC element of density **10.3gm/cm³** has a cell edge of **314 pm**, calculate the atomic mass of the element. (Given $N_A = 6.023 \times 10^{23}$) 5
- Q.5B Explain Nematic and Cholesteric phase of Liquid Crystals with diagram. 5
- Q.6A Explain the Process of Anodic coating with example. 5
- Q.6B Derive the expression for the rate constant for a first order reaction, also calculate the half-life formula. 5
- Q.7A Explain the structure properties and application of an optical Fiber with labeled diagram. 5
- Q.7B Explain the Carbon Nano tubes and their type on the basis of structure. 5
- OR**
- Q.7B In the Arrhenius equation for a certain reaction the values of Arrhenius constant **A** and E_a are **$4.0 \times 10^{13} \text{ s}^{-1}$** and **98600 J/mol** respectively. The reaction is of first order. At what temperature its half-life period will be **600 seconds**. 5
- Q.8 Explain the mechanism of Oxidation Corrosion with neat diagrams and reactions. 10
- OR**
- Q.8 What is Liquid Crystal? Give the classification of Liquid Crystals and their applications. 10
- Q.9 Show that in case of a first order reaction the time required to complete **99.9%** of the reaction is about **10** times that require for half of the reaction. 10
- OR**
- Q.9 What is Phase rule? Explain in detail the application of Phase rule to water system with neat diagram. 10
- Q.10 A sample of coal was tested for its calorific value in Bomb calorimeter the following results were obtained: Wt. of coal burned = **0.90 gm**, wt. of water in calorimeter = **2500 gm**, water equivalent of bomb calorimeter = **440 gm**, Rise in temperature = **2.42°C**, Acid correction **50 calories**, Cooling correction **0.52°C**, Fuse wire correction = **10 calories**. If fuel contain 6% Hydrogen and latent heat of steam is equal to **600 cal/gm** then calculate HCV and LCV in calories/g. 10