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Total Number of Pages : 02

B.Tech/  
Integrated Dual Degree (B.Tech and M.Tech)  
RCH2A002

2<sup>nd</sup> Semester Reg/Back Examination: 2022-23

Chemistry

BRANCH(S): AEIE, CIVIL, CST, CSEAI, CSEDS, CSE, CSIT, CSEAIME, ELECTRICAL & C.E, EEE, ELECTRICAL, ECE, ETC, EIE, IT, MANUTECH, MECH, METTA, MINING, PLASTIC, AE, AUTO

Time: 3 Hour

Max Marks: 100

Q. Code: M553

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.

The figures in the right hand margin indicate marks.

Part-I

Q1 Answer the following questions:

(2 x 10)

- State Lambert Beer's law.
- Draw the phase diagram of water system.
- What is producer gas?
- Explain the term component. How many components are present in the following system ?



- What is an Eutectic system?
- What is synthetic petrol
- What is cathodic protection?
- What are chromophores?
- What is power alcohol?
- What is stress corrosion?

Part-II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (6 x 8)

- Discuss the postulates of quantum mechanics.
- Discuss the effect of conjugation on chromophores.
- Write a short note on refining of petroleum.
- Explain triple point and eutectic point with examples.
- Discuss main features of the phase diagram of water system, explaining especially why the slope of solid-liquid line is negative for water.
- Write a short note on cathodic protection.
- Classify the nano materials based on the size of particles and distinguish between 0D, 1D and 2D nano materials.

- h) Give an account of gaseous fuels.
- i) What is calorific value of a fuel? How it is determined by Dulong's formula.
- j) Discuss how nanomaterials are synthesized via green synthetic routes.
- k) Discuss the principles and application of vibrational spectroscopy.
- l) How G.C.V. and N.C.V. of a fuel is calculated?

### Part-III

#### Only Long Answer Type Questions (Answer Any Two out of Four)

- Q3 Discuss the Lambert Beer's law and its application in analyzing samples by UV-Visible spectroscopy. (16)
- Q4 What is phase rule? Discuss the phase diagram of Bi-Cd system. (16)
- Q5 What is corrosion? Discuss different types of corrosion and factors affecting corrosion. (16)
- Q6 Explain the synthesis of nanomaterial by top-down and bottom-up approaches. Discuss the application of nanomaterials in environmental fields and electronic devices. (16)