

[Time: 2 Hours]

[Marks:60]

Please check whether you have got the right question paper.

- N.B:
1. Question No.1 is compulsory.
 2. All questions carry equal marks.
 3. Answer any three questions from remaining five questions.
 4. Atomic weights: (Ca=40, Mg=24, Cl=35.5, S=32, H=1, C=12, O=16, Na=23, N=14, Al=27, Fe=56, Ba =137.3)

Q.1) Answer any **five** from the following: -

[15 M]

- a) Differentiate between anodic and cathodic coatings.
- b) What is the significance of proximate analysis of coal?
- c) Give Composition, Properties and Uses of **Duralumin**.
- d) Mention any four properties of composite materials.
- e) State any six principles in green chemistry.
- f) What are the main constituents of paints?
- g) 2.5 g of the coal sample in a Bomb-calorimeter experiment gave 0.82g BaSO₄. Calculate percentage of S in the coal sample.

Q.2] a) Explain the mechanism of following types of corrosion:-

[06M]

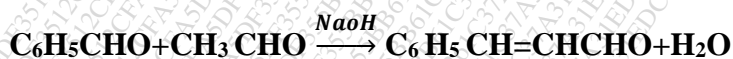
- i) Pitting corrosion
- ii) Galvanic cell corrosion

b) Write informative note on Fixed bed catalytic cracking.

[05M]

c) Calculate % Atom Economy for the following reaction

[04M]



Q.3] a) A fuel sample has the following composition: H₂=15%, CH₄ =25%, C₂H₄ = 30%, CO = 15%, CO₂ = 3%, and remaining nitrogen. Calculate the volume of oxygen and air required for complete combustion of 5 m³ of fuel.

[06M]

b) Explain Conventional and Greener route for synthesis of Indigo dye. Mention the green Chemistry principle involved.

[05M]

c) Discuss the following factors influencing the rate of corrosion:

- i) Nature of oxide film
- ii) Moisture

[04M]

