Printed Page:-

Subject Code:- AAS0102

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech.

SEM: I - CARRY OVER THEORY EXAMINATION - AUGUST 2022

Subject: Engineering Chemistry

Time: 3 Hours

Max. Marks: 100

General Instructions:

1. The question paper comprises three sections, A, B, and C. You are expected to answer them as directed.
2. Section A - Question No- 1 is 1 marker & Question No- 2 carries 2 mark each.
3. Section B - Question No-3 is based on external choice carrying 6 marks each.
4. Section C - Questions No. 4-8 are within unit choice questions carrying 10 marks each.
5. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION A 20

1. Attempt all parts:-

1-a. Generation of heat takes place in _____ lubrication. (CO1) 1

(a) Thin lubrication

(b) Thick lubrication

(c) Extreme pressure lubrication

(d) Boundary lubrication

1-b. The process of burning of fuels in presence of oxygen is called (CO1) 1

(a) Induction

(b) Ignition

(c) Condensation

(d) Combustion

1-c. The degree of freedom at triple point for water system_____. (CO 2) 1

(a) 0

(b) 1

(c) 2

(d) 3

1-d. Permanent hardness is removed by using _____ (CO 2) 1

(a) Lime

(b) Lime-soda

(c) Boiling

(d) none of these

1-e. The movement of electrons in Daniel cell is from _____ to _____ (CO 3) 1

(a) Zn to Cu

(b) Cu to Zn

(c) Zn to Ca

(d) Ca to Zn

1-f. The gas used to inflate Air Bag is (CO 3) 1

(a) Air

(b) Oxygen

(c) Helium

(d) Nitrogen

1-g. The least functionality of a monomer is convert into polymer is (CO 4) 1

(a) 1

(b) 3

(c) 2

(d) 6

1-h. If the arrangement of functional groups on carbon chain is alternating. It is called (CO 4) 1

(a) isotactic

(b) syndiotactic

(c) atactic

(d) tacticity

1-i. Fullerenes have _____ hybridization (CO 5) 1

(a) sp

(b) sp^2

(c) sp^3

(d) sp4

1-j. When absorption intensity of compound is decreased,it is called _____ (CO 5) 1

(a) Red shift

(b) Blue shift

(c) Hypochromic shift

(d) Hyperchromic shift

2. Attempt all parts:-

2.a.	What is Dulong's Formula? (CO1)	2
2.b.	What is hardness of water? (CO 2)	2
2.c.	Write the cell reaction of Zn/Cu galvanic cell? (CO 3)	2
2.d.	What do you mean by polymer blend? (CO 4)	2
2.e.	What do you mean by Frankel defect? (CO 5)	2

SECTION B 30

3. Answer any five of the following:-

3-a.	What are the waste obtained from Bio-gas plant? How they can be utilized? (CO1)	6
3-b.	Write short note on Sanitizers and disinfectants. (CO1)	6
3-c.	State the phase rule and discuss its application to water, vapour and ice system. (CO 2)	6
3-d.	Calculate temporary hardness and total hardness of a sample of water containing: $Mg(HCO_3)_2$ = 7.5 mg/L; $Ca(HCO_3)_2$ = 16 mg/L; $MgCl_2$ = 9 mg/L; $CaSO_4$ = 13.6 mg/L (CO 2)	6
3.e.	What is Galvanic Cell? describe it's working and construction. (CO 3)	6
3.f.	Give the structure and application of following polymers: Buna-S, Terylene, Nylon 6. (CO4)	6
3.g.	What do you mean by nanotechnology? Classify nanomaterials and give applications. (CO 5)	6

SECTION C 50

4. Answer any one of the following:-

4-a.	Discuss Bomb calorimeter method for determination of calorific value with corrections of solid fuel. (CO1)	10
4-b.	What are Lubricants? Give their mechanism. (CO1)	10

5. Answer any one of the following:-

5-a.	Explain Zeolite process of removing hardness of water with advantages and disadvantages.(CO 2)	10
5-b.	Define the following terms with example: Priming and Foaming, Caustic embrittlement, Sludge and Scales, Triple point, Metastable curve. (CO 2)	10

6. Answer any one of the following:-

6-a.	What is corrosion? Which factors affect the corrosion? (CO 3)	10
6-b.	With the help of Band theory, explain conductors, insulators and semi-conductors. (CO 3)	10

7. Answer any one of the following:-

7-a.	Write short note on: Conducting Polymers, Biodegradable Polymers (CO4)	10
7-b.	Give the example of some polymeric composite materials with their commercial application (CO 4)	10

8. Answer any one of the following:-

8-a.	Explain the structure, properties and application of Fullerene . (CO 5)	10
8-b.	Explain the Lambert-Beer's law? A solution shows a transmittance of 20%, when taken in a cell of 2.5 cm thickness. Calculate its concentration, if the molar absorption coefficient is 12000 dm^3/mol/cm. (CO 5)	10