PAPER ID-310868

Roll No: | | | | | | | | | | | | | |

B TECH
(SEM-I) THEORY EXAMINATION 2020-21
ENGINEERING CHEMISTRY

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Qno.	Question	Marks	CO
a.	Illustrate why ionic bond is non directional while covalent bond directional.	2	lis
b.	Define Frenkel defect with example.	2	1
c.	Distinguish between addition and condensation polymerization.	2	2
d.	What is the role of organometallic compound in polymerization?	2	2
e.	Differentiate between racemic mixture and meso compounds.	2	3
f.	In case of butadiene, absorption occurs at 217 nm whereas in ethylene it occurs at 175 nm. Predict the effect responsible for this absorption.	2	3
g.	What is triple point?	2	4
h.	What are different units of Hardness of water?	2	4
i.	Define gross and net calorific value of fuel.	2	5
j.	What is the composition of biogas?	2	5

SECTION B

2. Attempt any *three* of the following:

Qno.	Question	Marks	CO
a.	Draw the Molecular Orbital diagram of NO molecule. Calculate its bond order and predict their magnetic behavior.	10	1
b.	What are conducting polymers? How can we improve the conducting property of a polymer?	10	2
c.	By using the appropriate examples, discuss the stereochemical implications of S_N1 and S_N2 reactions.	10	3
d.	State the phase rule and discuss its application to water, vapors, and ice system. Is it possible to have a quadruple point in one component system?	10	4
e.	Discuss the electrochemical theory of corrosion in metals based on Hydrogen evolution and Oxygen absorption mechanism.	10	5

SECTION C

3. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	Discuss the structure and applications of Fullerenes.	10	1
b.	Illustrate the concept of liquid crystals. Classify them based on temperature and mention their important applications.	10	1

4. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	Describe the preparation of Grignard reagent with any five applications.	10	2
b.	Illustrate preparation, properties, and applications of – i) Nylon 6 ii) Nylon 6,6 iii) Terylene iv) Buna S	10	2

5. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	Explain the principle of IR spectroscopy. Show various types of stretching and bending vibrations in IR spectroscopy. Discuss the significance of Fingerprint region.	10	3
b.	What is optical activity? Give stereoisomers of 2, 3 dihydroxy 1,4 butane dioic acid.	10	3

6. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	How hard water can be purified by demineralization process? Compare its merits and demerits over Zeolite process.	10	4
b.	Outline the Hot Lime-Soda method for water softening. Compare the merits and demerits with ion exchange method.	10	4

7. Attempt any *one* part of the following:

Qno.	Question	Marks	CO
a.	Illustrate the diagrammatic representation, construction and working of bomb calorimeter.	10	5
b.	Explain proximate analysis of coal. On burning 0.3 gm of a solid fuel in a bomb calorimeter, the temperature of 3500 gm of water increased from 26.5° C to 29.2° C. Water equivalent of calorimeter and latent heat of steam are 385.0 gm and 587.0 cal/ gm.	10	5