Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2022

EN3BS14 Engineering Chemistry

Programme: B.Tech Branch/Specialisation: All

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. The number of milligrams of KOH required to neutralize the free acids in 1 gram of the oil is known as- **1**

(a) Base value (b) Acid value

(c) SAP value (d) Iodine value

ii. What type of lubrication is used in delicate machines like watches, sewing machines, etc? **1**

(a) Fluid film lubrication (b) Extreme pressure lubrication

(c) Boundary lubrication (d) None of these

iii. Which is/are the biopolymers? **1**

(a) Cellulose (b) Protein

(c) Nucleic acid (d) All of these

iv. Polymer formed by the hexamethylene diamine and adipic acid is- **1**

(a) Nylon 6 (b) Nylon 66 (c) Teflon (d) Buna-S

v. C_{60} is consisting of _____ pentagons and _____ hexagons. **1**

(a) 20, 12 (b) 12, 20 (c) 32, 12 (d) 12, 32

vi. CNT are made up of _____ sheet. **1**

(a) Graphene (b) Ethylene (c) Styrene (d) Propylene

vii. Which one is IR active molecule? **1**

(a) H_2 (b) Cl_2 (c) O_2 (d) H_2O

viii. Which of the following is directly proportional to the sample path length and concentration of the sample? **1**

(a) Reflection of light (b) Refraction of light

(c) Absorbance of light (d) Intensity of the light

P.T.O.

	ix.	Free energy is represented as- (a) G=H-TS (b) G= E-TS (c) G= S-TH (d) G= U-TS		**1**
	x.	Chemical formula of rust is- (a) Fe_2O_3 (b) Fe_2O_3. xH_2O (c) $Fe(OH)_2$ (d) FeO		**1**
Q.2	i.	An oil sample under test has a Saybolt Universal Viscosity same as that of standard Gulf oil and Pennsylvanian oil at 210°F. Their Saybolt Universal Viscosities at 100°F are 520, 758, and 420 seconds respectively. Calculate viscosity index of the sample oil.		**4**
	ii.	Define lubricant. Why is lubricant needed? Discuss the classification of lubricants with suitable examples.		**6**
OR	iii.	Define and write the importance of the following in selecting a lubricating oil for a particular use: (a) Flash point (b) Saponification value (c) Aniline point		**6**
Q.3	i.	What is natural rubber? Why Natural rubber needs vulcanization?		**4**
	ii.	What are the polymers? Write the detail note on the classification of polymers with example.		**6**
OR	iii.	Give the preparation, properties and applications of following polymers: (a) Polyethylene (b) Bakelite		**6**
Q.4	i.	What is optical fiber? Write the applications of optical fibers.		**4**
	ii.	What is fullerene? Write the properties and applications of fullerene.		**6**
OR	iii.	What are the superconductors? Write the properties and applications of superconductors.		**6**
Q.5	i.	Define spectroscopy. Write about the electromagnetic spectrum.		**4**
	ii.	What are the types of electronic transition that can occur in a molecule? Write about the instrumentation and applications of UV spectroscopy.		**6**

OR	iii.	Describe the gas chromatography on following points: (a) Instrumentation (b) Applications (c) Advantages		**6**
Q.6	i.	Define the following with significance: (a) Enthalpy (b) Entropy		**4**
	ii.	Define EMF. Describe the applications of EMF in chemistry field.		**6**
OR	iii.	What is corrosion? Write about the types of it. How can corrosion be prevented or controlled?		**6**

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