Total No. of Questions: 6 *Total No. of Printed Pages:2*

Enrollment No.....

Faculty of Engineering

End Sem (Even) Examination May-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. Lubrication is necessary to protect wear and tear caused due to ___. **1**
(a) Electrostatic force (b) Gravitational force
(c) Frictional force (d) Magnetic force

ii. Which one is the open cup apparatus? **1**
(a) Cleveland's (b) Penskey Marten's
(c) Abel's (d) None of these

iii. Nylon 66 is a **1**
(a) Homopolymer (b) Copolymer
(c) Elastomer (d) None of these

iv. Neoprene is a **1**
(a) Natural rubber (b) Synthetic rubber
(c) Fiber (d) Thermoplastic

v. The phenomenon on which optical fibers work is- **1**
(a) Resonance (b) Scattering
(c) Total internal reflection (d) Polarization

vi. The metal not showing superconductivity is- **1**
(a) Zn (b) Ti (c) V (d) Au

vii. Which radiation has low energy? **1**
(a) X-ray (b) Visible (c) Infrared (d) Ultraviolet

viii. Wavelength range of UV radiation is- **1**
(a) 200-400 nm (b) 400-800 nm
(c) 800 - 1200 nm (d) 1200-1400 nm

ix. Degree of disorder or randomness is known as- **1**
(a) Enthalpy (b) Entropy (c) Free energy (d) Specific heat

x. Galvanization is the process of coating iron with- **1**
(a) Tin (b) Nickel (c) Zinc (d) Copper

P.T.O.

Q.2 i. An oil sample under test has Saybolt Universal Viscosity same as that of standard Gulf oil and Pennsylvanian oil at 210 °F. The Saybolt Universal Viscosity at 100 °F is 550 SUS, 750 SUS, 450 SUS respectively. Calculate the Viscosity Index of the sample oil. **4**

ii. Define lubrication. How hydrodynamic lubrication differ from boundary lubrication? **6**

OR iii. Give the definition and significance of the following: **6**
(a) Saponification Number (b) Aniline Point

Q.3 i. What are Biopolymers? Give advantages of biopolymers. **4**

ii. Discuss the preparation, properties and uses of the following: **6**
(a) Poly Vinyl Chloride (b) Bakelite

OR iii. Write short note on the following: **6**
(a) Vulcanization of rubber (b) Classification of polymer

Q.4 i. Write short note on graphene. **4**

ii. What is Fullerene? Write important applications of Fullerene. **6**

OR iii. Explain the properties and applications of superconductors. **6**

Q.5 i. State Lambert Beer's law. Write the limitations of this law. **4**

ii. Explain IR spectroscopy on following points- **6**
(a) Types of molecular vibrations (b) Applications

OR iii. What is Gas chromatography? Explain its instrumentation and applications. **6**

Q.6 Attempt any two:

i. Define free energy. Write significance of free energy. **5**

ii. Define EMF. Write the important applications of EMF in the field of Chemistry. **5**

iii. What is Corrosion? Suggest the preventive measure to control corrosion. **5**

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Marking Scheme
EN3BS14 Engineering Chemistry

Q.1	i.	Lubrication is necessary to protect wear and tear caused due to ___.		**1**
		(c) Frictional force		
	ii.	Which one is the open cup apparatus?		**1**
		(a) Cleveland's		
	iii.	Nylon 66 is a		**1**
		(b) Copolymer		
	iv.	Neoprene is a		**1**
		(b) Synthetic rubber		
	v.	The phenomenon on which optical fibers work is-		**1**
		(c) Total internal reflection		
	vi.	The metal not showing superconductivity is-		**1**
		(d) Au		
	vii.	Which radiation has low energy?		**1**
		(c) Infrared		
	viii.	Wavelength range of UV radiation is-		**1**
		(a) 200-400 nm		
	ix.	Degree of disorder or randomness is known as-		**1**
		(b) Entropy		
	x.	Galvanization is the process of coating iron with-		**1**
		(c) Zinc		
Q.2	i.	Viscosity Index of the sample oil formula	1 mark	**4**
		Calculation	3 marks	
	ii.	Define lubrication	2 marks	**6**
		Difference b/w hydrodynamic lubrication and boundary lubrication	4 marks	
OR	iii.	Saponification Number definition	1 mark	**6**
		Significance	2 marks	
		Aniline Point definition	1 mark	
		Significance	2 marks	
Q.3	i.	Biopolymers	2 marks	**4**
		Advantages of biopolymers	2 marks	
	ii.	Preparation, properties and uses of the following:		**6**
		(a) Poly Vinyl Chloride	3 marks	
		(b) Bakelite	3 marks	
OR	iii.	Write short note on the following:		**6**
		(a) Vulcanization of rubber	3 marks	
		(b) Classification of polymer	3 marks	
Q.4	i.	Write short note on graphene.		**4**
		As per the explanation		
	ii.	Fullerene	2 marks	**6**
		Important applications of Fullerene	4 marks	
OR	iii.	Properties of superconductors	3 marks	**6**
		Applications of superconductors	3 marks	
Q.5	i.	State Lambert Beer's law	2 marks	**4**
		Limitations of this law	2 marks	
	ii.	Explain IR spectroscopy on following points-		**6**
		(a) Types of molecular vibrations	3 marks	
		(b) Applications	3 marks	
OR	iii.	Gas chromatography	1 mark	**6**
		Its instrumentation	2 marks	
		Applications	3 marks	
Q.6		Attempt any two:		
	i.	Definition of free energy	2 marks	**5**
		Significance of free energy	3 marks	
	ii.	Definition of EMF	1 mark	**5**
		Important applications of EMF in the field of Chemistry	4 marks	
	iii.	Corrosion	2 marks	**5**
		Preventive measure to control corrosion	3 marks	

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