Enrollment No.....

Faculty of Engineering / Science
End Sem Examination Dec-2023
EN3BS14 / BC3BS04 Engineering Chemistry

Programme: B.Tech./ B.Sc. 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. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. Which type of lubricant is often used in high temperature applications such as ovens and kilns? **1**
(a) Silicone (b) Graphite (c) Molybdenum disulfide (d) PTFE

ii. A high viscosity index indicates that a lubricant- **1**
(a) Becomes thinner at higher temperatures
(b) Maintains a more consistent viscosity over a range of temperatures
(c) Is better suited for cold weather applications
(d) Contains fewer additives

iii. What is the primary purpose of vulcanizing rubber? **1**
(a) To soften the rubber (b) To strengthen and harden the rubber
(c) To dissolve the rubber (d) To color the rubber

iv. Bakelite is a thermosetting plastic, which means it- **1**
(a) Can be easily melted and reshaped
(b) Cannot be remelted or reshaped once set
(c) Is derived from natural rubber
(d) Is highly biodegradable

v. Graphene is a single layer of carbon atoms arranged in a- **1**
(a) Hexagonal lattice (b) Cubic lattice
(c) Random lattice (d) Linear lattice

vi. Nanowires are often used in the development of- **1**
(a) Electronic and photonic devices
(b) Heavy machinery
(c) Building construction
(d) Agricultural equipment

vii. The Beer-Lambert Law relates which two parameters in spectroscopy? **1**
(a) Temperature and pressure (b) Volume and mass
(c) Wavelength and frequency (d) Absorbance and concentration

viii. Which branch of spectroscopy is primarily concerned with studying electronic excitation processes? **1**
(a) NMR spectroscopy (b) Infrared spectroscopy
(c) UV-Vis spectroscopy (d) X-ray spectroscopy

ix. In a spontaneous chemical reaction at constant temperature and pressure, the change in Gibbs free energy (ΔG) is- **1**
(a) Positive (b) Negative (c) Zero (d) Constant

x. What is the primary environmental factor that often contributes to the corrosion of metals? **1**
(a) High humidity (b) Low humidity
(c) High pressure (d) High temperature

Q.2 i. Define Aniline point. Write the significance of it. **4**
ii. Define lubricants. Write a detail note on classification of lubricants. **6**
OR iii. Define lubrication. Write a comparative note on different mechanism of lubrication. **6**

Q.3 i. Write difference between Natural rubber and Synthetic rubber. **4**
ii. Define polymer. Write a detail note on classification of Polymer. **6**
OR iii. Write short note on- **6**
(a) Teflon (b) Biodegradable polymers

Q.4 i. Write the applications of Fullerenes. **4**
ii. What are the superconductors? Write the properties and applications of superconductors. **6**
OR iii. What are the optical fibers? Write the properties and applications of optical fibers. **6**

Q.5 i. Define Spectroscopy. Write about the electromagnetic spectrum. **4**
ii. Write about the types of molecular vibrations. Write the applications of IR spectroscopy in detail. **6**
OR iii. Define chromatography. Write about the instrumentation and applications of gas chromatography. **6**

Q.6 i. Write difference between enthalpy and entropy. **4**
ii. Define EMF. Write the applications of EMF in detail. **6**
OR iii. What is corrosion? Write about the types of it. How it can be prevented? **6**

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Marking Scheme
Engg Chemistry EN3BS14

Q.1	i)	b) Graphite and c) Molybdenum disulfide		**1**
	ii)	b) Maintains a more consistent viscosity over a range of temperatures		**1**
	iii)	b) To strengthen and harden the rubber		**1**
	iv)	b) Cannot be remelted or reshaped once set		**1**
	v)	a) Hexagonal lattice		**1**
	vi)	a) Electronic and photonic devices		**1**
	vii)	d) Absorbance and concentration		**1**
	viii)	c) UV-Vis spectroscopy		**1**
	ix)	a) Positive		**1**
	x)	a) High humidity		**1**
Q.2	i.	Define Aniline point.	2 Marks	**4**
		Significance of it.	2 Marks	
	ii.	Define lubricants.	1 Mark	**6**
		Classification of lubricants.	5 Marks	
OR	iii.	Define lubrication.	1 Mark	**6**
		Comparative ……. lubrication.-	5 Marks	
Q.3	iv.	Difference …… Synthetic rubber.	4 Marks	**4**
	v.	Define polymer.	1 Mark	**6**
		Classification of Polymer.-	5 Marks	
OR	vi.	a) Teflon	3 Marks	**6**
		b) Biodegradable polymers	3 Marks	
Q.4	i.	Applications of Fullerenes.-	4 Marks	**4**
	ii.	What are the superconductors	1 Mark	**6**
		Write the properties	2.5 Marks	
		and applications of superconductors.	2.5 Marks	
OR	iii.	What are the optical fibers	1 Mark	**6**
		Write the properties	2.5 Marks	
		and applications of optical fibers.	2.5 Marks	
Q.5	i.	Define Spectroscopy.	2 Marks	**4**
		Electromagnetic spectrum.-	2 Marks	
	ii.	Types of molecular vibrations.	3 Marks	**6**
		Applications of IR spectroscopy.	3 Marks	
OR	iii.	Define Chromatography. –	1 Mark	**6**
		Write about the instrumentation	2.5 Marks	
		and applications of Gas chromatography.-	2.5 Marks	
Q.6	i.	Difference between Enthalpy and Entropy.-	4 Marks	**4**
	ii.	Define EMF.	1 Mark	**6**
		Write the applications of EMF in detail.-	5 Marks	
OR	iii.	What is corrosion	1 Mark	**6**
		Write about the types of it.	2.5 Marks	
		How it can be prevented.-	2.5 Marks	

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P.T.O.