

Enrollment No.....



Faculty of Engineering
End Sem (Odd) Examination Dec-2017
EN3BS04 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. Chloramines are used in drinking water for _____ **1**
 (a) Filtration (b) Sedimentation
 (c) Disinfection (d) None of these
- ii. Alkalinity in water cannot be due to the presence of _____ ions **1**
 (a) OH⁻ ions (b) CO₃²⁻ (c) HCO₃⁻ (d) OH⁻ ions & HCO₃⁻
- iii. Highest carbon content is found in which type of coal **1**
 (a) Peat (b) Anthracite (c) Bituminous (d) Lignite
- iv. 1Kcal = _____ Cal = _____ B.Th.U **1**
 (a) 1000 Cal & 3.968 B.Th.U. (b) 1000 Cal & 2.2 B.Th.U.
 (c) 100Cal & 3.87 B.Th.U. (d) None of these
- v. The wax present in oil raises the _____ **1**
 (a) Drop point (b) Aniline point
 (c) Pour point (d) Fire point
- vi. Viscosity Index is zero for **1**
 (a) Paraffin base Gulf oil (b) Paraffin base Pennsylvanian oil
 (c) Napthanic base Gulf oil (d) Napthanic base Pennsylvanian oil
- vii. Alumina brick is **1**
 (a) Acidic (b) Basic (c) neutral (d) weakly basic
- viii. Buckminsterfullerene is : **1**
 (a) C₆₀ (b) C₄₀ (c) C₂₀ (d) C₁₀
- ix. The electrochemical cell converts **1**
 (a) Chemical energy into electrical energy
 (b) Electrical energy into chemical energy
 (c) Both (a) & (b)
 (d) None of these

- x. H- bonding can be detected by _____ Spectroscopy **1**
 (a) IR (b) NMR (c) UV-Visible (d) None of these

- Q.2 i. Draw Break point chlorination curve and name the four stages. **2**
 ii. Write short note on Boiler corrosion. **3**
 iii. 1.5 gm of CaCO₃ was dissolved in dilute HCL and solution was made to one litre by dilution. 100 ml of this solution required 44 ml of EDTA solution, while 50 ml of the sample water required 20 ml of EDTA solution. Calculate total hardness of water sample. **5**

- OR iv. Explain hot lime soda process under following heads: **5**
 (a) Diagram (b) Process (c) Advantages (d) Disadvantages

- Q.3 i. Differentiate between nuclear fission and nuclear fusion. **2**
 ii. Write short note on octane number and cetane number. **3**
 iii. Explain Bergius process diagrammatically **5**

- OR iv. A sample of coal was found to contain the following C=80%, H=5.0%, O=1.0%, N=2%, remaining being ash. Calculate the amount of minimum air required for complete combustion of 1 kg of coal sample. **5**

- Q.4 i. Define corrosion and give two cause of corrosion. **2**
 ii. Write reaction, properties and uses of following: **8**
 (a) PVC (b) Polyethene (c) Teflon (d) Nylon-6,6

- OR iii. Write short note on: (a) Biopolymers (b) Flash and Fire point **8**

- Q.5 i. What is superconductor? Give its properties and uses. **4**
 ii. Describe manufacturing of cement diagrammatically. **6**

- OR iii. Explain any three properties of refractory. **6**

- Q.6 Attempt any two: **5**
 i. Write a detail note on principle and application of IR **5**
 ii. Discuss principle and application of UV **5**
 iii. Describe GC under following heads: **5**
 (a) Principle (b) Diagram (c) Working (d) Application

P.T.O.

EN3BS04 Engineering Chemistry

Marking Scheme

Q.1	i.	(c) Disinfection	1
	ii.	(d) OH ⁻ ions & HCO ₃ ⁻	1
	iii.	(b) Anthracite	1
	iv.	(a) 1000 Cal & 3.968 B.Th.U.	1
	v.	(c) Pour point	1
	vi.	(c) Naphthenic base Gulf oil	1
	vii.	(a) Acidic	1
	viii.	(a) C ₆₀	1
	ix.	(a) chemical energy into electrical energy	1
	x.	(a) IR	1
Q.2	i.	Curve-1 mark, name of stages -1 mark	2
	ii.	Explanation + reaction - 2+1	3
	iii.	Formula-1, steps-3, ans-1/2, unit - ½ mark	5
OR	iv.	Diagram -2, process-1, two adv-1, two disadv-1	5
Q.3	i.	4 points (1/2 each)	2
	ii.	Octane no-1.5, cetane no.-1.5 mark	3
	iii.	Diagram -3, detail-2 mark	5
OR	iv.	Formula-1, steps-3, ans-1/2 ,unit ½ marks	5
Q.4	i.	Definition-1, two cause (1/2 each)	2
	ii.	(Rea-1, two prop ½ two uses-1/2) * 4	8
OR	iii.	(a) detail-2, ex-1 rea-1 mark	8
		(b) def of flash and fire pt -1, method/detail-2, two significance - 1 mark	
Q.5	i.	Def-1, three prop-1.5, three uses-1.5 mark	4
	ii.	Diagram-2, rea-2, method-2	6
OR	iii.	Three properties with detail-2 marks each	6
Q.6		Attempt any two:	
	i.	Principle-2, six app-1/2 mark each	5
	ii.	Principle-2, six app-1/2 mark each	5
	iii.	Principle-1,diagram-1, working-1,four app-1/2 mark each	5
