TED (15)	1004B
(Revision	- 2015)

A20 - 08964

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Sign	ature								

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2020

ENGINEERING CHEMISTRY-I

[N	Maximum Marks: 75] [T	ime: 2.15 Hours]
	PART-A (Answer <i>any three</i> questions in one or two sentences. Each question carries	s 2 marks)
I.	1. Define carbon nanotube.	
	2. Give the relationship between p ^H and p ^{OH} .	
	3. What are the disadvantages of using hard water in industrial purposes?	
	4. Define alloys. Give any one example.	
	5. Mention any two advantages of powder metallurgy.	$(3 \times 2 = 6)$
	PART-B (Answer <i>any four</i> of the following questions. Each question carries 6 r	narks)
II	1. (a) Differentiate between atom and molecule.	
	(b) Calculate the number of protons and neutrons of the following elements.	4+2=6
	14 23	
	(i) N (ii) Na	
	7	
	2. (a) Explain role of promoter and poison in the rate of reaction using examples.	
	(b) Define atomic number and mass number	4+2=6
	3. (a) Explain acidic and basic buffers with one example for each.	
	(b) Explain the concept of conjugate acid-base pair with an example	4+2=6
	4. (a) Calculate the p ^H of 0.002M H ₂ SO ₄ .	
	(b) Define ionic product of water and give its value at 25°C.	4+2=6
	5. (a) Explain Clarke's Process for removal of temporary hardness of water.	
	(b) Distinguish between soft water and hard water.	4+2=6
	6. (a) Give the advantages of using reverse osmosis for desalination of sea water	r.
	(b) Give the composition of following alloys.	
	(i) Bronze (ii) Solder	4+2=6

		PART-C (Answer any of the three units from the following. Each full question carries 15 marks)	
		UNIT – I	
III	(a)	Give any five properties of carbon nanotube.	5)
	(b)	Explain Chemical Vapour Deposition method for the synthesis of carbon nanotubes.	5)
	(c)	Define catalysis. Explain positive and negative catalysis with one example for each. (2)	5)
		OR	
IV	(a)	Explain Homogeneous and Heterogeneous catalysis with one example for each.	5)
	(b)	Give any four applications of nano materials in medicine.	5)
	(c)	Explain HiPCO method for the synthesis of carbon nonotube.	5)
		UNIT – II	
V	(a)	(i) Explain basicity of an acid and acidity of a base with suitable examples.	
		(ii) Calculate the equivalent weight of (a) HCl (b) Ca(OH) ₂	
		(Atomic weight of $H = 1$, $Cl = 35.5$, $Ca = 40$, $O = 16$)	5)
	(b)	Give the principle of Volumetric analysis. Calculate the normality of sodium	
		hydroxide solution if 20 ml of which was neutralized by 17 ml of 0.12 N nitric acid. ((5)
	(c)	Define pH of a solution. Give any three applications of pH.	5)
		OR	
VI	(2)	Define Molarity of solution. Calculate the molarity of a solution prepared by	
VI	(a)	dissolving 3.24 g of potassium hydroxide in water to give 500 ml of the solution.	
			5)
	(b)	Explain Arrhenius concept and Lewis concept of acids and bases with suitable examples. (
	` ′	Define indicator in Volumetric analysis. Give the indicators used in the following	ر د
	(0)	-	
		titrations. Justify your answer.	
		(i) Acetic acid x Sodium Hydroxide (ii) Hydroxhloria acid x Sodium Carbonata (1)	۲۱
		(ii) Hydrochloric acid x Sodium Carbonate (:	5)

4+2=6

7. (a) Give any four purposes of making alloys.

(b) Give the effects of any two impurities in steel.

UNIT- III

VII	(a)	What are the disadvantages of using hard water in domestic purposes?	(5)
	(b)	Give treatment processes to make potable water.	(5)
	(c)	Define sterilization of water. Give different chemical changes involved in the	
		sterilization of water by bleaching powder.	(5)
		OR	
VII	(a)	List any five characteristics of potable water.	(5)
	(b)	Give reason for permanent hardness of water. Explain any one method for the	
		removal of permanent hardness of water.	(5)
	(c)	Explain the desalination of sea water by reverse osmosis.	(5)
		UNIT - IV	
IX	(a)	Briefly explain any five properties of metals.	(5)
	(b)	Compare the processes Quenching and Tempering of steel. Give the advantage of	
		Tempering over Quenching.	(5)
	(c)	Explain Powder metallurgy for the preparation of alloys.	(5)
		OR	
X	(a)	Explain Fusion method for the preparation of alloys.	(5)
	(b)	Define heat treatment of steel. Explain (i) Annealing (ii) Nitriding.	(5)
	(c)	Give composition and compare any two properties of	
		(i) Wrought iron (ii) Steel (iii) Cast iron	(5)

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