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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE, NOVEMBER - 2024

APPLIED CHEMISTRY

[Maximum marks: 75] [Time: 3 Hours]

PART A

I. Answer all the following questions in one word or one sentence. Each question carries 1 mark.

(9 x 1 = 9 Marks)

		Module outcome	Cognitive level
1	The wave associated with a moving particle is called a …….	M1.02	U
2	Which type of bonding is present in HF molecule?	M1.03	U
3	Write the normality equation.	M2.02	U
4	The hydrogen ion concentration of a solution having P^H=4.	M2.02	A
5	The water which is free from all cations and anions is called ……	M2.03	R
6	Solder is an alloy of …… and ……..	M3.01	U
7	Natural rubber is a polymer of ……	M3.02	U
8	The amount of substance deposited at the electrode is directly proportional to ……	M4.02	R
9	The reaction in which gain of electrons occur is called ……..	M4.01	U

PART B

II. Answer any eight questions from the following. Each question carries 3 marks.

(8 x 3 = 24 Marks)

		Module outcome	Cognitive level
1	Calculate the product of Uncertainties in position and velocity of an electron of mass 9.1 x 10^{-31} kg. (Plank's constant h = 6.626 x 10^{-34} kgm^2/s)	M1.01	A
2	Explain the formation of NH_4^+ ion.	M1.03	R
3	20 ml of NaOH solution was neutralised with 25 ml of an acid of normality 0.11. Find the normality of the base.	M2.02	A
4	List any three disadvantages of hard water.	M2.03	U
5	Define (a) Standard solution (b) PPm	M2.01	U
6	What are Carbon nano tubes? Which are the different types of Carbon nano tubes?	M3.03	R
7	How are refractories classified? Give one example for each classification.	M3.01	U
8	A galvanic cell is represented as $Zn/Zn^{2+}//Cu^{2+}/Cu$. Write the anode reaction, cathode reaction and net cell reaction.	M4.04	R

9	What is corrosion? Give any two examples for corrosion.	M4.05	U
10	Distinguish between Electrolytes and Non electrolytes with one example each.	M4.02	U

PART C

Answer all questions. Each question carries seven marks.

(6 x 7 = 42 Marks)

		Module outcome	Cognitive level
III	(a) Give any three differences between Orbit and Orbital. (3 Marks)	M1.02	U
	(b) Write down the de Broglie relation. What will be the wave length of a ball of mass 100g moving with a velocity of 10m/s? (4 Marks)	M1.01	A
	OR		
IV	(a) List any three merits of Bohr model of atom. (3 Marks)	M1.01	U
	(b) Define an electrovalent bond. Explain the formation of sodium chloride. (4 Marks)	M1.03	U
V	(a) Define Ionic product of water. Give its value at 25^oC (3 Marks)	M2.02	U
	(b) Calculate the normality and molarity of the sodium carbonate solution if 1.075g of sodium carbonate is present in 250 ml of its solution. (Molecular mass of sodium carbonate = 106) (Equivalent mass of sodium carbonate = 53) (4 Marks)	M2.02	A
	OR		
VI	(a) Write any three characteristics of potable water. (3 Marks)	M2.04	U
	(b) What is meant by sterilization of drinking water? Explain the different chemical charges involved in the sterilization of water using bleaching powder. (4 Marks)	M2.04	R
VII	(a) What is a buffer solution? Give one example for acidic and basic buffer. (3 Marks)	M2.02	R
	(b) Calculate the P^H of (i) 0.002 M H_2SO_4 (ii) 0.001 M NaoH (4 Marks)	M2.02	A
	OR		
VIII	(a) Distinguish between the two types of hardness. (3 Marks)	M2.03	R
	(b) Draw the block diagram for the production of potable water used in municipal supply of drinking water with all necessary details. (4 Marks)	M2.04	U
IX	(a) Write any three purposes of making alloys. (3 Marks)	M3.01	U
	(b) Distinguish between thermoplastics and thermosetting plastics with one example each. (4 Marks)	M3.02	U
	OR		
X	(a) Distinguish between homopolymers and copolymers with one example each. (3 Marks)	M3.02	U
	(b) List any four applications of nanomaterials. (4 Marks)	M3.03	U

XI	(a) Write any three differences between Electrolytic cell and Galvanic cell. (3 Marks)	M4.03	U
	(b) A solution of Copper Sulphate is electrolysed for 10 minutes with a current of 1.5 amperes. What is the mass of copper deposited at the electrode? (e.c.e of copper = 0.00033g/C) (4 Marks)	M4.02	A
	OR		
XII	(a) What are fuel cells? Give one example. (3 Marks)	M4.04	U
	(b) Explain the electrolytic refining of copper with necessary electrode reactions. (4 Marks)	M4.03	U
XIII	(a) What are primary and secondary cells? Give one example for each type. (3 Marks)	M4.05	U
	(b) Distinguish between metallic and electrolytic conduction. (4 Marks)	M4.01	U
	OR		
XIV	(a) What is electrochemical series? Mention any one application of it. (3 Marks)	M4.05	U
	(b) Explain any two methods of barrier protection to control corrosion. (4 Marks)	M4.05	U

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