TED (21) -1004
(Revision- 2021)

N22-2102220008

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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE – NOVEMBER - 2022

APPLIED CHEMISTRY

(Maximum Marks : 75) [Time : 3 hours]

PART–A

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

(9x1=9 marks)

		Module Outcome	Cognitive level
1	In an atom, no two electrons can have same set of four quantum numbers. This is called…….principle.	M 1.02	U
2	Give an example of an ionic compound.	M 1.03	R
3	What is the end point of a titration?	M2.01	U
4	A solution has a pH of 7. What would happen to the pH if H^+ ion is added to the solution?	M2.02	A
5	Define hard water.	M2.03	R
6	What are the monomers of Bakelite?	M3.02	R
7	Define nanomaterial.	M3.03	R
8	Name one antirust solution.	M4.05	R
9	What is electrochemical equivalent of a substance?	M4.02	R

PART - B

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

(8x3=24marks)

		Module Outcome	Cognitive level
1	Write all quantum numbers of electron present in the outer most shell of sodium. (Atomic number of Na = 11)	M 1.02	U
2	Explain co-ordinate bond with an example.	M 1.03	U
3	What is ionic product of water? Write its mathematical statement.	M2.02	U
4	Calculate the normality of KOH solution containing 2.8g in 250ml.	M2.01	A
5	Explain Soda lime process for the removal of hardness of water.	M2.03	U
6	Define an alloy. What are the components of solder?	M3.01	R
7	What is borosilicate glass? Give one of its uses.	M3.01	R
8	What is an addition polymer? Give one example.	M3.02	U
9	Distinguish between strong and weak electrolytes with one example for each.	M4.03	U
10	What are the factors affecting the rate of corrosion?	M4.05	U

PART - C

Answer **all** questions from the following. Each question carries 7 marks.

(6x7=42marks)

		Module Outcome	Cognitive level
III	Explain the formation of ionic and covalent bond with one example for each. (7marks)	M2.03	U
	OR		
IV	a) State Heisenberg's uncertainty principle. Calculate the uncertainty in the velocity of an electron, if the uncertainty in position is 10^{-8}m. (h=6.625 x 10^{-34} kgm^{2}s^{-1}, m=9.1 x 10^{-31}kg) (5 marks)	M2.01	U
	b) Define orbital. (2 marks)	M2.02	R
V	a) Define normality and molarity. Write the formulae to calculate molarity and normality. Calculate the molarity of H_2SO_4 solution containing 4.9 g acid in 600ml. (Molecular weight of H_2SO_4 = 98) (5 marks)	M2.01	A
	b) What is an indicator? (2 marks)	M2.01	R
	OR		
VI	a) What is potable water? List the characteristics of potable water. (5 marks)	M2.04	R
	b) Explain any one method for the sterilization of water. (2 marks)	M2.04	U
VII	a) Calculate the pH of (i) 0.01M H_2SO_4 and 0.01M NaOH. (5 marks)	M2.02	A
	b) What is acid buffer? Give one example. (2 marks)	M2.02	R
	OR		
VIII	a) Explain ion-exchange method for the removal of hardness of water. (5 marks)	M2.03	U
	b) Give any two disadvantages of using hard water in boilers. (2 marks)	M2.03	U
IX	a) List any five applications of nanomaterials. (5 marks)	M3.03	R
	b)Give any two purposes of making alloys. (2 marks)	M3.01	R
	OR		
X	a) List the differences between thermo plastics and thermosetting plastics. Give one example for each. (5 marks)	M3.02	U
	b) Write the monomers of Buna-N and Buna-S. (2 marks)	M3.02	R
XI	Define electrolysis. Explain electrolytic refining of copper. (7 marks)	M4.03	U

	OR		
XII	a) What is an electrochemical cell? Write the electrode reactions and net cell reaction of Daniel cell. (5 marks)	M4.04	U
	b) What is anodizing? (2 marks)	M4.05	R
XIII	a) Distinguish between metallic conductors and electrolytic conductors. Give one example for each. (5 marks)	M4.03	U
	b) What is a primary cell? Give one example. (2 marks)	M4.04	R
	OR		
XIV	a) State Faraday's second law of electrolysis. A certain quantity of electricity is passed through an aqueous solution of $AgNO_3$ and $CuSO_4$ solution connected in series. The amount of silver deposited is 1.08 g. What will be the amount of copper deposited? (Equivalent mass of copper = 31.7g and equivalent mass of silver = 108 g). (5 marks)	M4.02	A
	b) What is corrosion? (2 marks)	M4.05	R

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