Government College of Engineering Kannur

Name : ....

Roll No. : ....

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Series Exam 1

Ist Semester

GXCYT122 - Chemistry for Information & Electrical Science

CS 2K24

Total Mark: 30 **Total Time: 1 Hrs : 30 Mins**

Course Outcome (CO)	
CO1	Explain the basic concepts of electrochemistry to explore the possible applications in various engineering fields.
CO3	Describe the use of various engineering materials in different industries

PART A

No.	Questions	Marks	CO
1.	Distinguish between metallic conduction and electrolytic conduction	3	CO1
2.	What will be the standard electrode potential of Ni electrode if the cell potential of the cell $Ni\|Ni^{2+}(0.1M)\|\|Cu^{2+}(.01M)\|Cu$ is 0.59V at 25°C? $E^{o}_{Cu/Cu^{2+}} = -0.34V$	3	CO1
3.	What are fire retardant polymers? Give two examples with their structure.	3	CO3
4.	Write a short note on carbon quantum dots (CQDs)	3	CO3

PART B

No.	Questions	Marks	CO
5. a)	Describe the construction and working of calomel electrode with the help of a neat, labelled diagram.	6	CO1
5. b)	Fluorine (F_2) and chlorine (Cl_2) are added to solution containing F^- and Cl^- ions. What reaction would occur if the concentration of each species is 1 M ? You are given with standard reduction potentials of F_2 and Cl_2 $F_2 + 2e^- \rightarrow 2F^-$ $E^o = +2.87V$ $Cl_2 + 2e^- \rightarrow 2Cl^-$ $E^o = +1.36V$	3	CO1
	OR		
6.	What is electrochemical series? Explain the applications of it with examples	9	CO1
7.	What are conducting polymers? Explain the classification of conducting polymers	9	CO3
	OR		
8.	Describe the construction, working, advantages and applications of dye-sensitized solar cells (DSSCs) with the help of a neat, labelled diagram.	9	CO3

Reg No. Name

Government College of Engineering

Kannur

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

1st Semester - B.Tech

Series Exam 2

Course : GXCYT122 - Chemistry for Information & Electrical Science

Total Mark: 30 **Total Time: 1 Hrs : 30 Mins**

CO2	Explain the basic concepts of corrosion to explore the possible applications in various engineering fields.	Understanding(U)
CO4	Use appropriate analytical techniques for different engineering materials	Applying(P)
CO5	Outline various water treatment methods	Understanding(U)
CO6	Outline various waste management methods	Understanding(U)

CO BL MARK

PART A

Answer all questions. Each question carries 3 marks

1. Explain the working principle of a glass electrode. CO2 2 (3)
2. What is the underlying theory behind electroless plating? CO2 2 (3)
3. Write the mathematical representation of the law governing absorption of light by molecules of a solution. A dye solution of concentration 0.05 M shows an absorbance of 0.055 at 540 nm while a test solution of the same has an absorbance of 0.025 under same conditions. Calculate concentration of test solution. CO4 3 (3)
4. State any three applications of UV-Visible spectroscopy. CO4 2 (3)

PART B

Answer any one full question from each module. Each question carries 9 marks

Module 3

5. Describe the various types of electronic transitions in molecules with the help of a molecular orbital (MO) diagram. Discuss the effect of conjugation on the absorption maxima, using 1,3-butadiene as an example. CO4 2 (9)

OR

6. Sketch the modes of vibration of H_2O molecule. Comment on their IR activity. Calculate and compare the strengths of C – H bond and C – O bond if the absorption frequencies are $3000\,cm^{-1}$ and $1700\,cm^{-1}$ respectively. Atomic masses of C, H and O are 12u, 1u, and 16u respectively. CO4 3 (9)

Module 4

7. What are the advantages of $H_2 - O_2$ fuel cell. A water sample, upon analysis, gives the following data: $Ca^{2+} = 200\ mg/L$, $Mg^{2+} = 180\ mg/L$, $(HCO_3)^- = 360\ mg/L$, $Na^+ = 200\ mg/L$, $Cl^- = 250\ mg/L$. Calculate the permanent hardness of the water sample. CO5 3 (9)

OR

8. How is BOD determined? What is COD? Compare them with five significant differences. CO6 2 (9)