A   **Reg. No. :** ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚

Question Paper Code: R1Y04

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2024

First Semester

Civil Engineering

R21UCY106 - GEO CHEMISTRY

(Common to Agricultural branch)

(Regulations R2021)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The covalent bond is formed between _____   CO1-U

    (a) NaCl   (b) $MgCl_2$ (c) CH_4 (d) NaF

2.   The Unit of Hardness----   CO1-U

    (a) ppm   (b) Kcal/Molec   (c) Kg   (d) Joule

3. Distilled water can be obtained by   CO1- U

    (a) boiling   (b) Zeolite process   (c) Lime-soda process   (d) Ion-exchange process

4. Desalination of water can be carried out by   CO1- U

    (a) Reverse osmosis   (b) Zeolite process

    (c) Lime-soda process   (d) Ion-exchange process

5. Identify the type of corrosion takes place when two different metals   CO1- U
    are in contact with each other in a medium
    (a) Galvanic Corrosion   (b) Pitting Corrosion

    (c) Wire fence Corrosion   (d) Pipeline Corrosion

6. The non-volatile portion of medium in paint is   CO1- U

    (a) Pigment   (b) Vehicle   (c) Thinner   (d) Extender

7. The low moisture content in Atterberg limit -----   CO1- U

   (a) Solid   (b)) Semisolid   (c) Plastic   (d) liquid

8. Sodic soil is a   CO1- U

   (a) $MgCl_2$ (b) NaCl   (c) KCl   (d) NaO

9. Which of the following shift is related to bathochromic shift?   CO2- U

   (a) To higher wavelength   (b) To lower wavelength

   (c) Decrease in intensity   (d) Increase in intensity

10. With the help of which of the following equations is the distance calculated from a known wavelength of the source and measured angle?   CO2- U

    (a) Coolidge equation   (b) Bragg's equation   (c) Debye equation   (d) Scherer equation

PART – B (5 x 2= 10 Marks)

11. What are the types of chemical bonding?   CO1- U

12. Write a method to differentiate hard water from soft water.   CO1- U

13. Why hydrogen gas evolution when metal is immersed in acidic solution. Analyze the reason and give report   CO4- Ana

14. Mention the soil particles using mm length.   CO1- U

15. Draw the energy level diagram of UV-Visible spectroscopy.   CO2- U

PART – C (5 x 16= 80 Marks)

16. (a) Discuss the hybridization involved in methane, acetylene and ethylene   CO1-U   (16)

    Or

    (b) Write a brief outline of the postulates of valence bond theory. Discuss SS, SP and SP overlapping using valence bond theory.   CO1-U   (16)

17. (a)   Analyze the total, temporary and permanent hardness by EDTA method.   CO5- Ana   (16)

    Or

    (b) How to remove permanent hardness using synthetic chemical of Zeolite.   CO5- Ana   (16)

R1Y04

18. (a) The ship hull and underground pipeline made up on iron body. After few months the ship and pipeline damaged. Analyze the problem and how to prevent this problem in ship hull and pipeline.   CO4-Ana   (16)

<div align="center">Or</div>

    (b) Metal area covered by a drop of water, dust, scale and sand etc.,. Analyze the type of corrosion and explain it?   CO4-Ana   (16)

19. (a) Write detail about consistency of soils?   CO1- U   (16)

<div align="center">Or</div>

    (b) Explain the charge of particles and their interaction   CO1- U   (16)

20. (a) Comment beer lamberts law and application   CO2-U   (16)

<div align="center">Or</div>

    (b) Summarize the principle, working and application of Mass Spectroscopy.   CO2-U   (16)