8/5/26

Reg No.: _____ Name: _____

UGH32026ISA-1

Jyothi Engineering College(Autonomous)

B. Tech Degree S2 (R) Examination, May 2026(2025 Scheme)

25CHT102 - CHEMISTRY FOR PHYSICAL SCIENCE

CE, ME, MR

Total Mark: 60 **Total Time: 2hrs 30 min**

CO MARK

PART A

(Answer All Questions. Each question carries 3 marks)

1. How are lubricants classified? Give one example for each. CO1 (3)
2. Explain the applications of nanomaterials. CO1 (3)
3. Define electrochemical corrosion. CO2 (3)
4. What are the limitations of hydrogen–oxygen fuel cells? CO2 (3)
5. The force constant of a C=O bond is higher than that of a C–O bond. Which bond will absorb IR radiation at a higher frequency? Explain. CO3 (3)
6. Explain the interpretation of a TGA curve. CO3 (3)
7. Draw a flow chart for sewage treatment and write the need for sewage treatment. CO4 (3)
8. Define dissolved oxygen (DO). Write the factors which influence the amount of DO. CO4 (3)

PART B

(Answer any one full question from each module, each question carries 9 marks)

Module - 1

9. a) What are fullerenes? Write the properties and applications of fullerenes. CO1 (5)
   b) Compare solid, liquid and gaseous fuels. CO1 (4)

OR

10. Describe various steps involved in manufacture of Portland cement. CO1 (9)

Module - 2

11. a) Describe how pH of a solution is measured using a Glass electrode. CO2 (5)
    b) Calculate the cell potential at 25°C for the galvanic cell: CO2 (4)

    $Al \mid Al^{3+}$ (0.2 M) $\| Sn^{4+}$ (0.1 M) $\mid Sn^{2+}$ (0.01 M).

    Given $E°(Al^{3+}/Al) = -1.66$ V and $E°(Sn^{4+}/Sn^{2+}) = +0.15$ V.

OR

12. Explain the construction and working of Lithium ion battery with a neat diagram. CO2 (9)

Module - 3

13. Explain the principle, instrumentation, working and applications of Gas Chromatography. CO3 (9)

OR

14. a) Sketch the DTA of Calcium oxalate monohydrate and mention the reactions in each step. CO3 (5)
    b) Explain different types of molecular vibrations involved in IR spectroscopy. CO3 (4)

Module - 4

15. Explain various methods of solid waste management. CO4 (9)

OR

16. a) Define the degree of hardness. Calculate the hardness of the following solutions: CO4 (5)

(a) 0.02 N $CaCl_2$ solution

(b) 0.02 M $MgCl_2$ solution.

b) Explain disinfection by Ozone and UV. Write their advantages. CO4 (4)

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