

Reg No.: _____

Name : _____



Jyothi Engineering College(Autonomous)

B. Tech Degree S2 (S) Examination, June 2026 (2025 Scheme)

25CHT102 - CHEMISTRY FOR PHYSICAL SCIENCE

Total Mark: 60



PART A

(Answer All Questions. Each question carries 3 marks)

1. Define the terms a) octane number b) cetane number. CO1 (3)
2. How is calorific value of a fuel calculated using Dulong's formula? CO1 (3)
3. Sketch Glass electrode and write down the cell representation. CO2 (3)
4. What is meant by galvanic series? CO2 (3)
5. Explain the order of UV -Visible absorption in the following Compounds.
a) Benzene b) Naphthalene c) Anthracene CO3 (3)
6. Define thermogram. CO3 (3)
7. How can we regenerate the exhausted resins in ion exchange method? CO4 (3)
8. What is meant by air pollution? How are the air pollutants classified? CO5 (3)

PART B

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

Module - 1

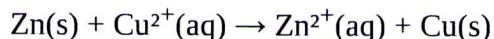
9. a) Explain the classifications of nanomaterials based on materials. CO1 (5)
b) Define the terms a) Fire point b) Flash point. Write their significance. CO1 (4)

OR

10. With the help of a diagram explain the determination of calorific value of a fuel using Bomb calorimeter giving its construction and working. CO1 (9)

Module - 2

11. a) Describe the mechanism and applications of electroless copper plating. CO2 (5)
b) Calculate the equilibrium constant (K) at 25°C for the cell reaction: CO2 (4)



$$\text{Given: } E^\circ(\text{Zn}^{2+}/\text{Zn}) = -0.76 \text{ V, } E^\circ(\text{Cu}^{2+}/\text{Cu}) = +0.34 \text{ V}$$

OR

12. Explain the construction and working of Hydrogen-Oxygen fuel cell with a labelled diagram. CO2 (9)

Module - 3

13. Calculate the vibrational modes of CO_2 and H_2O . Sketch the vibrational modes. Which of them are IR active? CO3 (9)

OR

14. a) Describe the instrumentation of Gas Chromatography with a neat diagram.

CO3 (5)

b) Distinguish between TGA and DTA.

CO3 (4)

Module - 4

15. How is ozone depletion harmful to mankind? Explain the chemistry behind it and also give the control measures.

CO5 (9)

OR

16. a) Distinguish between temporary and permanent hardness. Suggest a method for the removal of temporary hardness and permanent hardness.

CO4 (5)

b) Calculate the temporary hardness, permanent hardness, and total hardness of a water sample containing the following components: $\text{CaSO}_4 = 2 \text{ ppm}$, $\text{MgSO}_4 = 4 \text{ ppm}$, and $\text{Ca}(\text{HCO}_3)_2 = 6 \text{ ppm}$.

CO4 (4)
