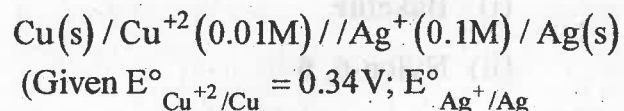


(4)

TCH-101

Weight of coal burnt = 1.28 gm, Weight of water taken = 350 gm, Weight of water equivalent of bomb and calorimeter = 2050 gm, Rise in temperature = 2.2°C, Fuse wire correction = 15 cal, Acid correction = 25 cal, H = 6.6% and Latent heat of condensation of steam = 580 cal/gm.

5. (a) Define and calculate the cell potential of the given cell at 25°C. Also write the half cell reactions of the following cell : (CO5)



- (b) What do you understand by Corrosion ? Explain it with the help of electro-chemical theory of corrosion. (CO5)

- (c). Write short notes on the following : (CO5)

(i) Concentration Cells

(ii) Fuel Cells

TCE-101

3180

H

Roll No. ....

TCH-101

**B. TECH. (FIRST SEMESTER)  
END SEMESTER  
EXAMINATION, Dec., 2023  
ENGINEERING CHEMISTRY**

**Time : Three Hours**

**Maximum Marks : 100**

**Note :** (i) All questions are compulsory.

(ii) Answer any *two* sub-questions among (a), (b) and (c) in each main question.

(iii) Total marks in each main question are **twenty**.

(iv) Each sub-question carries 10 marks.

1. (a) On the basis of MOT diagram, explain why  $\text{N}_2$  is diamagnetic in nature. Also find its bond order and magnetic nature.

(CO1)

P. T. O.

(2)

TCH-101

- (b) What do you mean by H-bonding ?  
Explain why, ortho-nitrophenol and para-nitrophenol can be able to separate through fractional distillation method.

(CO1)

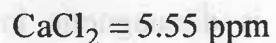
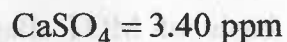
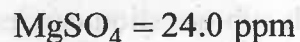
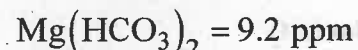
- (c) Write short notes on the following : (CO1)

- (i) Band theory of metals
- (ii) Applications of Spectroscopy

2. (a) Explain the zeolite process for softening of hard water and also discuss its advantages and disadvantages. (CO2)

- (b) Define and calculate the temporary and permanent hardness of a water sample which on analysis have the following :

(CO2)



- (c) Write short notes on the following : (CO2)

- (i) Boiler feed water
- (ii) Calgon conditioning

(3)

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3. (a) (i) What do you mean by Functionality of a monomer ? (CO3)

- (ii) Differentiate between thermoplastic and thermosetting polymers.

- (b) Write short notes on the following : (CO3)

- (i) Conducting polymers
- (ii) Biodegradable polymers

- (c) Write the preparation, properties and uses of the following : (CO3)

- (i) Bakelite

- (ii) Nylon-6, 6

4. (a) What do you mean by Biogas ? Explain the construction and working of the Biogas plant. (CO4)

- (b) Write short notes on the following : (CO4)

- (i) Biomass

- (ii) CNG and LPG.

- (c) Define and calculate the HCV and LCV of a fuel, when tested in the laboratory for its calorific value in the bomb calorimeter, the following data were obtained : (CO4)