



R20 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

Subject code:3B2AM

B.Tech II Semester Regular Examinations, September 2021
APPLIED CHEMISTRY

(ECE)

Maximum Marks: 70

Date:11.09.2021 Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 What are bonding, nonbonding and anti-bonding orbitals?
- 2 Compare high spin and low spin complexes
- 3 Convert 10 ppm into mg/L and degree French.
- 4 Define temporary and permanent hardness of water.
- 5 Differentiate between primary battery and secondary battery?
- 6 Why efficiency of fuel cell is greater than other energy device?
- 7 Write Ilkovic equation and its significance.
- 8 Mention applications of amperometric titrations.
- 9 Justify the use of TMS as a reference compound in NMR spectroscopy.
- 10 How many fundamental vibrational frequencies can be observed in the infrared absorption spectrum of CO₂?

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 Mention the postulates of Molecular orbital theory and draw the molecular orbital energy level diagram of F₂. (10M)
- OR
- 12 A. Explain distribution of electrons as stated in LCAO with pictorial representation.
B. Explain the magnetic properties of octahedral complexes. (5+5)M
 - 13 A. Explain Ion- exchange process with a neat labeled diagram.
B. Determine the total hardness of a sample of water in oFr and oClarke which showed the following analysis. Suspended mater = 100 mg, Ca(NO₃) = 16.4 mg / ltr.; mgSO₄ = 24 mg/ ltr; mgcl₂ = 19 mg / ltr; NaoH = 0 mg / ltr.; KoH = 56 mg/ltr. (Atmoic masses to Na = 23, mg = 24, k = 39 and Ca = 40) (5+5)M
- OR
- 14 A. Discuss about boiler corrosion, its causes and preventive measures.
B. Describe the steps involved in the treatment of water for municipal supply. (5+5)M

15 How do you determine the pH of a solution by making use of glass electrode? 10M

OR

16 A. Explain the composition, Applications and advantages of Lithium cell
B. What is reference electrode? Explain the construction and functioning of Quinhydrone electrode. (5+5)M

17 A. What is cyclic Voltammetry? Discuss the principle and applications. (5+5)M
B. Discuss the methodology used in Determination of stability constants of complexes.

OR

18 A. Discuss the principle involved in amperometric titrations
B. Give brief account of d.c.polarography technique and their advantages over conventional d.c.polarography. (5+5)M

19 A. Explain the principle of IR spectroscopy and the types of stretching and bending vibrations with suitable examples.
B. Explain various types of electronic transitions when a molecule absorbs in UV-Visible region. (5+5)M

OR

20 A. Discuss about various factors influencing chemical shift.
B. Discuss the selection rules and types of electronic transitions for electronic spectra of molecules. (5+5)M