

Code No: 152AN

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B.Tech I Year II Semester Examinations, November/December - 2020****CHEMISTRY****(Common to EEE, CSE, IT)****Time: 2 hours****Max. Marks: 75****Answer any five questions
All questions carry equal marks**

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- 1.a) Explain various factors that influence the magnitude of crystal field stabilization energy in complex compounds.
- b) Explain filling of electrons in F_2 molecule in terms of Molecular orbital theory with neat diagram. [7+8]
- 2.a) Explain the postulates of Molecular orbital theory.
- b) With the help of MO diagram, calculate bond order of O_2 molecule and predict its magnetic behavior. [7+8]
- 3.a) How municipal water can be treated before distribution for the domestic purpose?
- b) Determine the temporary, permanent and total hardness in ppm units for a water sample from Warangal which showed the following analysis:- $Ca(HCO_3)_2 = 30.4$ mg/litre; $Mg(HCO_3)_2 = 30.2$ mg/litre; $NaCl = 5.85$ mg/litre; $CaCl_2 = 20.2$ mg/litre; $MgSO_4 = 11.2$ mg/litre; Organic matter = 15.5 mg/litre. [7+8]
- 4.a) Describe the reverse osmosis process for desalination of brackish water with diagram.
- b) What is the process of Chlorination? What are the advantages? Explain the significance of breakpoint chlorination. [7+8]
- 5.a) Explain the following factors that can influence the rate of corrosion:
i) specific volume ratio ii) Position in galvanic series iii) Humidity.
- b) Describe the construction and working of calomel electrode. [8+7]
- 6.a) Calculate the equilibrium constant for the following reaction at 298K.
 $Cu + Cl_2 \rightarrow CuCl_2$ $E_{Cu^{+2}/Cu}^0 = 0.34$ V : $E_{Cl_2/2Cl^-}^0 = 1.36$ V.
- b) What is the principle involved in the cathodic protection? Discuss the sacrificial anodic and impressed current methods. [7+8]
- 7.a) Explain Markownikoff's addition products in addition of HBr to propene.
- b) What are conformers? Discuss the conformational analysis with reference to n-Butane. [7+8]
- 8.a) Discuss various factors that influence chemical shift.
- b) Give an account of various modes of fundamental vibrations. [7+8]

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