15133 (OR)

M.Sc,. DEGREE EXAMINATION, NOVEMBER 2016

FIRST SEMESTER

MATERIAL SCIENCE & NANO TECHNOLOGY

Paper III FUNDAMENTALS IN PHYSICAL CHEMISTRY

(No additional sheet will be supplied)

Time: 3 hours Max. Marks: 75

PART-A (5 x 3 = 15 marks)
Answer any FIVE questions
Each question carries Three (3) marks
Each answer should not exceed One (1) page

1. Define order of a reaction? 89.5% of first order reaction is completed in 250 sec^{-1} calculate the time for 75 % completion of the reaction
2. Give an account on unimolecular reactions
3. Write about the principle of conductometry
4. Give the schematic representation of HMDE
5. Write limitations of valence bond theory
6. Explain the d- orbital splitting in square planar complexes
7. Discuss the classification of polymer
8. Give an account on the mechanism of free radical polymerization

PART-B (4 x 15 = 60 marks)
Answer ALL questions
Each question carries Fifteen (15) marks
Each answer should not exceed Six (6) pages

9. (a) Derive the reaction rate equation for collision theory
   (b) Explain the Hinshelwood theory

OR

10. Discuss the activated complex theory and its demerits
11. Give an account on
    a) Amperometric titrations
    b) Linear limitation plots

OR

12. (a) Explain the principle and applications of anodic stripping voltametry
    (b) Give an account on the applications of polorography
13. Discuss the werner's theory and sidgwick's concept of co-ordination compounds

OR

14. Explain stereochemistry of 4 co-ordinate complexes and factors effecting on crystal field splitting energy
15. Give an account on
    (a) Addition polymerization
    (b) Condensation polymerization

OR

16. Explain the polymerization techniques and how can you determine the molecular weight by using weight average molecular weight method

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