

35134

**MSc. DEGREE EXAMINATION – OCTOBER 2015**  
**THIRD SEMESTER**

**Material Science & Nano Technology**

**Paper IV – NANO CATALYSIS AND COMPOSITES**

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. Distinguish between physisorption and chemisorptions.
2. What is energy band engineering?
3. Write the synthesis of zeolites.
4. Write the importance of octane and cetane number.
5. Discuss the physical properties of free and supported nano particles.
6. Write in brief the synthesis of vinyl acetate.
7. What is a composite? Write the need of composite materials.
8. Write the elastic properties of short fiber composites.

**PART – A (4 x 15 = 60 Marks)**

Answer ALL questions.

Each Question carries Fifteen (15) marks.

Each Answer should not exceed Six (6) pages.

9. (a) Discuss the kinetics of heterogeneous catalysis..  
(b) Explain the determination of surface area of non porous materials by BET method.  
(OR)
10. What is a photocatalytic process? Write the process of hydrogen generation by organic synthesis.
11. (a) Write the synthesis of meso porous silica and mesoporous carbon materials.  
(b) Discuss the catalytic activity of sulfated zirconia.  
(OR)
12. (a) Write the process of gasoline production from crude oil.  
(b) Discuss polymerization catalysis and automotive exhaust catalysis.
13. Discuss the synthesis methods of co-precipitation and deposition precipitation of nano particles.  
(OR)
14. Discuss the catalytic activity and properties of gold nano particles.
15. Write the elastic properties of uni directional FRPs in longitudinal direction. How stress and strain are distributed at fiber ends.  
(OR)
16. Write about strength of unidirectional lamina in transverse direction. Explain the fabrication of composite by Hand layup.

