A Reg. No. : | | | | | | | | | | |

Question Paper Code: 59773

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2019

Open Elective

Civil Engineering

15UME973 - SYNTHESIS OF NANO MATERIALS

(Common to CSE, ECE, EEE, EIE, IT, Chemical)

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Question

PART A - (10 x 1 = 10 Marks)

1. The size of nanoparticles is between _____ nm. CO1- R

   (a) 100 to 1000 (b) 0.1 to 10 (c) 1 to 100 (d) 0.01 to 1

2. Ball mill is similar to CO1- R

   (a) milling (b) grinding (c) shaping (d) drilling

3. Self assembled mono layer is a CO2 -R

   (a) Top-down approach (b) bottom-up approach

   (c) both (d) None

4. Zeolite contains CO2- R

   (a) Na (b) K (c) Ca (d) All

5. Which method is did not comes under micro lithography CO3- R

   (a) Photolithography (b) Soft lithography (c) micromachining (d) matrix isolation

6. Reproduction of text from template CO3- R

   (a) Manufacturing (b) Fabrication (c) Lithography (d) none

7. Silver halide was first used as an CO4 -R

   (a) magnetic material (b) conductive material

   (c) resistor (d) imaging material

8. Zeolite contains CO4- R

(a) Na (b) K (c) Ca (d) All

9. Scattered electrons is used in ? CO5- R

(a) TEM (b) SEM (c) X-ray (d) AFM

10. Optical microscopy range CO5- R

(a) 10X (b) 100X (c) 1000X (d) All

PART – B (5 x 2= 10Marks)

11. Explain top down approach with example. CO1- R

12. What is meant by Zeolite?. CO2 -R

13. Define Sputtering. CO3 -R

14. Mention any two applications of carbon nano tubes (CNT). CO4 -R

15. Compare SEM and TEM. CO5 -R

PART – C (5 x 16= 80Marks)

16. (a) Explain briefly bulk and nano composite materials with advantages and applications. CO1 -App (16)

Or

(b) Explain briefly Sol-gel process with neat sketch. CO1 -App (16)

17. (a) Explain in detail about biomimetic approaches. CO2- App (16)

Or

(b) Describe elaborately the clusters, colloids and zeolites with examples CO2- App (16)

18. (a) Write the working principle and operation of magnetron sputtering approach with neat sketch. CO3- Ana (16)

Or

(b) Briefly explain any one method of epitaxial growth techniques CO3 -Ana (16)

19. (a) Explain briefly AgX photography techniques and how to interpret the data CO4 -U (16)

Or

(b) Explain with a neat sketch, the process of nanoporous materials. CO4 -Ana (16)

20.	(a)	Briefly explain about X ray characterization with applications	CO5- U	(16)
		Or		
	(b)	Explain with diagram (i) SEM (ii) TEM	CO5- U	(16)