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Question Paper Code: 99773

B.E./B.Tech. DEGREE EXAMINATION, DEC 2021

Open Elective

Civil Engineering

19UME973 - SYNTHESIS OF NANO MATERIALS

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

(Regulation 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Question

PART A - (10 x 1 = 10 Marks)

- Mechanical alloying is done at. CO1- R
(a) solid state (b) liquid state (c) vapour state (d) none
- Inert Gas Condensation technique CO1- R
(a) Top down approach (b) Bottom up method
(c) Both (d) None
- Self assembled mono layer is a CO2 -R
(a) Top-down approach (b) bottom-up approach
(c) both (d) None
- The atom economy obtained for green synthesis is in the range of CO2- R

(a) 62-70% (b) 72-82% (c) 40-50% (d) 90-100%
- Using E-beam writing can write letters in metal in the range of CO3- R
(a) upto 100nm (b) 100-1000nm (c) few micrometer (d) few mm
- Sputtering process is only effective on CO3- R
(a) Non conductive materials (b) Conductive materials
(c) Magnetic materials (d) Crystalline materials

7. Which of the following techniques is commonly used in synthesis of zeolites? CO4 -R
 (a) hydrothermal (b) impregnation (c) solid state reaction (d) precipitation
8. Which of the following methods can be used to produce nano-powders of oxides? CO4- R
 (a) Plasma arching (b) Sol-gel technique
 (c) Chemical vapour deposition (d) Mechanical crushing
9. The wavelength range of X-rays is _____ CO5- R
 (a) 1 mm to 700 nm (b) 400 nm to 1 nm (c) 1 nm to 0.001 nm (d) 0.1 m to 1 mm
10. X-Rays are not used in _____ CO5- R
 (a) Photographic film (b) Photocells
 (c) Geiger tubes (d) Ionization Chamber

PART – B (5 x 2= 10Marks)

11. List out the method of synthesis of nanomaterial. CO1- R
12. Define hydrophilic. CO2 -R
13. Define sputtering process CO3 -R
14. Write short notes on carbon nanotubes. CO4 -R
15. Define morphology. CO5 -R

PART – C (5 x 16= 80Marks)

16. (a) Explain briefly the solgel process with neat sketch. CO1 -U (16)
 Or
 (b) Explain Mechanical milling and alloying process with neat sketch. CO1 -U (16)
17. (a) Write the Short notes on pulsed electrochemical deposition? CO2- U (16)
 Or
 (b) Explain the Chemical Approach of self-assembled monolayers? CO2- U (16)
18. (a) Explain the Physical Approaches of Vapor deposition? CO3- U (16)
 Or
 (b) Explain the Magnetron sputtering? CO3 -U (16)
19. (a) Explain the Process of Nano porous Materials? CO4 -U (16)
 Or

- (b) Explain what terms of Materials used in nano sponges? CO4 -U (16)
20. (a) Explain the Electron microscopy of TEM with a neat sketch CO5- U (16)
Or
- (b) Explain about optical spectroscopy of metal? CO5- U (16)

