

25. Explain the significance of nano electronics and liquid crystals in the development of advanced displays. CO4 [K₂]
26. List two advantages and two disadvantages of using shape memory alloys in engineering applications. Provide a brief explanation for each advantage and disadvantage mentioned. CO4 [K₃]

Answer any FOUR Questions
PART D (4 x 10 = 40 Marks)

27. Differentiate between the top-down and bottom-up approaches in nano material synthesis. Provide examples of techniques associated with each approach and discuss their advantages and limitations in controlling nano scale properties. CO1 [K₃]
28. Define the terms zero-dimensional, one-dimensional, and two-dimensional nanostructures, providing examples of each. Discuss how the dimensionality of nanostructures influences their physical and chemical properties. CO2 [K₂]
29. Explain the electro deposition method for nano thin film synthesis, emphasizing its precision and control over material properties. Discuss the electrochemical principles underlying the deposition process. CO3 [K₃]
30. Explain the fabrication techniques for carbon nanotubes, focusing on pulsed laser deposition. Discuss the structural and electronic properties of carbon nanotubes and their significance in materials engineering. CO4 [K₂]
31. Evaluate the role of nano materials in the fields of nano medicine and nano biotechnology. Discuss how nano structures enable targeted drug delivery, imaging, and therapeutic applications in medicine. Highlight a specific nano material or nanostructure that has shown promising results in biomedical applications, emphasizing its potential impact on healthcare. CO2 [K₅]
