

1. How can the principles of differential equations and linear algebra be effectively combined to model and optimize complex engineering systems in the context of a B.Tech. program?
2. How can the principles of encryption and decryption be effectively applied within the realm of Information Technology Regulations 2021 to ensure data security and compliance with data privacy laws?
3. Challenging Question: How would you explain, using advanced mathematical concepts, the relationship between molecular structures in polymers and their mechanical properties, focusing on how understanding materials science on a molecular level can influence engineering applications?
4. How can the properties of dielectric materials be leveraged to enhance the efficiency and performance of various electronic devices, and what mathematical principles underlie the optimization of dielectric properties for specific applications?
5. How does the crystallinity of a material impact its mechanical properties, specifically in terms of stress-strain response and deformation behaviors, and how can this knowledge be applied to design more resilient and efficient materials for practical applications?
6. How does the coordination and radius ratio concept influence the formation of point defects in crystal structures, and how can an understanding of these defects inform strategies for controlling material properties at the atomic level?