

Code No: 51004

R09

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year Examinations, October/November - 2020

ENGINEERING PHYSICS

(Common to CE, EEE, ME, ECE, CSE, EIE, IT, AE, BT, AME, MIE)

Time: 2 hours

Max. Marks: 75

Answer any five questions  
All questions carry equal marks

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- 1.a) Write the list of different types of bonding in solids.
- b) With neat diagram describe the structure of ZnS. [8+7]
- 2.a) Describe in detail powder method to determine the crystal structure.
- b) Define Burger's vector? What is Burger's circuit? Explain. [7+8]
- 3.a) Explain the concept of density of states. Derive an expression for the same.
- b) Describe Davisson and Germer's experiment and explain how it enabled the verification of wave nature of matter. [8+7]
- 4.a) Discuss the band theory of solids and explain the formation of energy bands.
- b) What is Bloch theorem? Explain.
- c) Explain E-K diagram. [6+5+4]
- 5.a) Derive an expression for concentration of electrons in conduction band of intrinsic semiconductor.
- b) Explain construction and working principle of photodiode. [8+7]
- 6.a) Write a short note on the following:  
i) Piezo-electricity ii) Ferro- electricity
- b) Describe classification of Dia, Para and Ferro magnetic materials on the basis of magnetic moment. [9+6]
- 7.a) Describe the principle, construction and working of a He-Ne laser.
- b) Derive an expression for Acceptance angle and Numerical aperture. [7+8]
- 8.a) Discuss Sabine's formula for reverberation time.
- b) With neat diagram, explain fabrication of nano-materials by using Sol-gel technique. [8+7]

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