

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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