

R09

Code No: 51004

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year Examinations, October/November - 2016

ENGINEERING PHYSICS

**(Common to CE, EEE, ME, ECE, CSE, CHEM, EIE, BME, IT, MCT, ETM, MMT,
AE, BT, AME, MIE, PTE, MSNT, AGE)**

Time: 3 hours

Max. Marks: 75

Answer any five questions

All questions carry equal marks

- 1.a) Describe the formation of various types of bonds in solids with suitable examples.
b) Describe the seven crystal systems with diagrams. [8+7]
- 2.a) Describe with neat diagram Laue's method of determination of crystal structure.
b) What is Burger Vector? What is Burger's circuit? Explain. [8+7]
- 3.a) Distinguish between Maxwell Boltzmann statistics and Fermi Dirac statistics.
b) Discuss the de-Broglie hypothesis of duality of matter particles. [8+7]
- 4.a) Show that Kronig-Penny model leads to energy band structure in solids.
b) Explain the concept of effective mass of an electron. [8+7]
- 5.a) Derive an expression for the carrier concentration of p-type semiconductor.
b) Draw I/V characteristics curve of a PN junction diode and explain. [8+7]
- 6.a) Explain Clausius -Mosotti relation in dielectrics subject to static fields.
b) Distinguish the difference between Type-I and Type-II superconductors. [8+7]
- 7.a) Explain the characteristics of LASER.
b) Derive an expression for the Numerical Aperture and Acceptance angle of an optical fiber. [7+8]
- 8.a) Describe the top-down methods by which nanomaterial's are fabricated.
b) The average reverberation time of hall is 1.5 second and the area interior surface is 3340 m^2 . If the volume of the hall is 12000 m^3 find absorption coefficient. [7+8]

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