Code No: 09A1BS02

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year Examinations, November/December – 2013
ENGINEERING PHYSICS
(Common to all Branches)

Time: 3 hours   Max. Marks: 75

Answer any five questions
All questions carry equal marks
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1.a)   Derive an expression for estimation of cohesive energy of a solid.
  b)   Copper has FCC structure and atomic radius 0.1278 nm. Calculate the inter planar
       spacing for (111) and (321) planes.   [15]

2.a)   Describe with a neat diagram, Laue's method of determination of crystal
       structure.
  b)   X-rays of wavelength 1.5418 A^0 are diffracted by (111) plane in a crystal at an
       angle 30^0 in the first order. Calculate the inter atomic spacing.   [15]

3.a)   Derive an expression for density of states of an electron.
  b)   Calculate the de-Broglie wavelength of an electron which has been accelerated
       from rest on application of potential of 400 Volts.   [15]

4.a)   What is Bloch theory? Explain in detail.
  b)   Write the conclusions given by Kroning-Penny model.   [15]

5.a)   What is hall-effect? Derive an expression for Hall-Coefficient for n-type
       semiconductor.
  b)   Write notes on "Liquid Crystal Display".   [15]

6.a)   Explain the following:
       i) Dielectric constant.
       ii) Electric susceptibility.
       iii) Polarizability.
  b)   Define magnetization and show that B= μ_0 (H+M), Give an account on
       ferromagnetic materials.   [15]

7.a)   Describe the construction and working of Ruby laser.
  b)   Calculate the Numerical Aperture and acceptance angle for an optical fiber with
       core and cladding refractive indices being 1.48 and 1.45 respectively.   [15]

8.a)   Derive Sabine formula for reverberation time.
  b)   Write the application of Nanotechnology in electronic industry.   [15]

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