

Code No: R07A1BS03

R07**Set No. 2****I B.Tech I Semester Examinations, November 2010****ENGINEERING PHYSICS****Common to CE, ME, CHEM, MECT, MEP, AE, AME, MMT****Time: 3 hours****Max Marks: 80****Answer any FIVE Questions****All Questions carry equal marks**

1. (a) Explain the electric polarization.
 (b) Discuss the ionic polarization with neat diagram and also prove ionic polarization is inversely proportional to the square of the natural frequency of the ionic molecule and directly proportional to its reduced mass.
 (c) Compare active and passive dielectrics. [4+8+4]
2. (a) What is the basic principle for optical fiber communication?
 (b) Describe the fiber optic communication with neat diagram.
 (c) Calculate the fractional index change for a given optical fiber if the refractive indices of the core and cladding are 1.563 and 1.498 respectively. [4+8+4]
3. (a) What do you mean by Acoustics?
 (b) Define reverberation.
 (c) Explain the basic requirement of acoustically good hall. [4+4+8]
4. (a) Define interference of light.
 (b) Describe and explain the phenomenon of interference of light.
 (c) Two coherent sources whose intensity ratio is 36:1 produce interference fringes. Deduce the ratio of maximum intensity to minimum intensity. [4+8+4]
5. (a) Define number of atoms per unit cell and packing factor.
 (b) Obtain the expressions for number of atoms per unit cell and packing factor for SC, BCC and FCC lattices. [6+10]
6. (a) What is pumping in Laser?
 (b) From atomic transitions, Derive Einstein's relation and hence deduce the expression for the ratio of Spontaneous emission rate to the stimulated emission rate.
 (c) What is the ratio of the stimulated emission to spontaneous emission at a temperature of 280° C for sodium D - line?
 For sodium $\lambda = 5890 \text{ \AA}$. [4+8+4]
7. (a) Discuss the chemical properties of nano materials.
 (b) Analyze the application of nano technology in the bio fields. [8+8]
8. (a) What do you mean by magnetism?

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- (b) Explain the origin of magnetic dipole moments.
- (c) Mention the use of magnetic dipoles in the magnetic materials. [4+8+4]

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 For sodium $\lambda = 5890 \text{ \AA}$. [4+8+4]
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 (b) Explain the origin of magnetic dipole moments.
 (c) Mention the use of magnetic dipoles in the magnetic materials. [4+8+4]
6. (a) Define number of atoms per unit cell and packing factor.
 (b) Obtain the expressions for number of atoms per unit cell and packing factor for SC, BCC and FCC lattices. [6+10]
7. (a) Define interference of light.
 (b) Describe and explain the phenomenon of interference of light.
 (c) Two coherent sources whose intensity ratio is 36:1 produce interference fringes. Deduce the ratio of maximum intensity to minimum intensity. [4+8+4]

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8. (a) Discuss the chemical properties of nano materials.
(b) Analyze the application of nano technology in the bio fields. [8+8]

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R07**Set No. 1****I B.Tech I Semester Examinations, November 2010****ENGINEERING PHYSICS****Common to CE, ME, CHEM, MECT, MEP, AE, AME, MMT****Time: 3 hours****Max Marks: 80****Answer any FIVE Questions****All Questions carry equal marks**

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(b) Define reverberation.

(c) Explain the basic requirement of acoustically good hall.

[4+4+8]

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