Code.No: R05010201 | R05 | SET-1

I - B.TECH EXAMINATIONS, DECEMBER - 2010
APPLIED PHYSICS
(COMMON TO EEE, ECE, CSE, EIE, BME, IT, E.CON.E CSS, ETM, ECC, ICE)
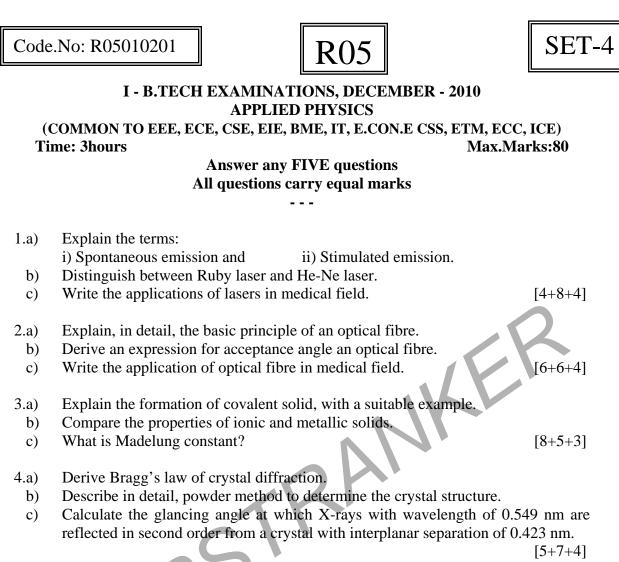
Time: 3hours   Max.Marks:80

Answer any FIVE questions
All questions carry equal marks

- - -

1.a) Explain the formation of covalent solid, with a suitable example.
   b) Compare the properties of ionic and metallic solids.
   c) What is Madelung constant?   [8+5+3]

2.a) Derive Bragg's law of crystal diffraction.
   b) Describe in detail, powder method to determine the crystal structure.
   c) Calculate the glancing angle at which X-rays with wavelength of 0.549 nm are reflected in second order from a crystal with interplanar separation of 0.423 nm.
                                                                     [5+7+4]

3.a) Mention the ideas which prompted de Broglie to propose his concept of matter waves.
   b) Derive an expression for the de Broglie wavelength of an electron.
   c) Describe the experimental verification of matter waves using Davisson-Germer experiment.   [6+4+6]

4.a) Discuss with suitable mathematical expressions, the motion of an electron in a periodic potential.
   b) Explain how the above theory leads to the concept of band structure of solids.
   c) What is effective mass of electron?   [8+4+4]

5.a) Obtain the relevant mathematical expressions for:
      i) Electronic Polarizability and
      ii) Ionic Polarizability.
   b) Distinguish between ferroelectrics and piezoelectrics.   [10+6]

6.a) Explain in detail, the properties of superconducting materials.
   b) What is BCS theory? Enumerate the important results of BCS theory.
   c) Describe the applications of superconductors in various fields.   [6+6+4]

7.a) Explain the terms:
      i) Spontaneous emission and   ii) Stimulated emission.
   b) Distinguish between Ruby laser and He-Ne laser.
   c) Write the applications of lasers in medical field.   [4+8+4]

8.a) Explain, in detail, the basic principle of an optical fibre.
   b) Derive an expression for acceptance angle an optical fibre.
   c) Write the application of optical fibre in medical field.   [6+6+4]

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Code.No: R05010201 | R05 | SET-2

I - B.TECH EXAMINATIONS, DECEMBER - 2010
APPLIED PHYSICS
(COMMON TO EEE, ECE, CSE, EIE, BME, IT, E.CON.E CSS, ETM, ECC, ICE)
Time: 3hours   Max.Marks:80
Answer any FIVE questions
All questions carry equal marks
- - -

1.a) Mention the ideas which prompted de Broglie to propose his concept of matter waves.
  b) Derive an expression for the de Broglie wavelength of an electron.
  c) Describe the experimental verification of matter waves using Davisson-Germer experiment.   [6+4+6]

2.a) Discuss with suitable mathematical expressions, the motion of an electron in a periodic potential.
  b) Explain how the above theory leads to the concept of band structure of solids.
  c) What is effective mass of electron?   [8+4+4]

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  b) Derive an expression for acceptance angle an optical fibre.
  c) Write the application of optical fibre in medical field.   [6+6+4]

7.a) Explain the formation of covalent solid, with a suitable example.
  b) Compare the properties of ionic and metallic solids.
  c) What is Madelung constant?   [8+5+3]

8.a) Derive Bragg's law of crystal diffraction.
  b) Describe in detail, powder method to determine the crystal structure.
  c) Calculate the glancing angle at which X-rays with wavelength of 0.549 nm are reflected in second order from a crystal with interplanar separation of 0.423 nm.
                                                                      [5+7+4]

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Code.No: R05010201 | R05 | SET-3

I - B.TECH EXAMINATIONS, DECEMBER - 2010
APPLIED PHYSICS
(COMMON TO EEE, ECE, CSE, EIE, BME, IT, E.CON.E CSS, ETM, ECC, ICE)
Time: 3hours   Max.Marks:80
Answer any FIVE questions
All questions carry equal marks
- - -

1.a) Obtain the relevant mathematical expressions for:
   i) Electronic Polarizability and
   ii) Ionic Polarizability.
 b) Distinguish between ferroelectrics and piezoelectrics.   [10+6]

2.a) Explain in detail, the properties of superconducting materials.
 b) What is BCS theory? Enumerate the important results of BCS theory.
 c) Describe the applications of superconductors in various fields.   [6+6+4]

3.a) Explain the terms:
   i) Spontaneous emission and   ii) Stimulated emission.
 b) Distinguish between Ruby laser and He-Ne laser.
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4.a) Explain, in detail, the basic principle of an optical fibre.
 b) Derive an expression for acceptance angle an optical fibre.
 c) Write the application of optical fibre in medical field.   [6+6+4]

5.a) Explain the formation of covalent solid, with a suitable example.
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 c) What is Madelung constant?   [8+5+3]

6.a) Derive Bragg's law of crystal diffraction.
 b) Describe in detail, powder method to determine the crystal structure.
 c) Calculate the glancing angle at which X-rays with wavelength of 0.549 nm are reflected in second order from a crystal with interplanar separation of 0.423 nm.
                                                                          [5+7+4]
7.a) Mention the ideas which prompted de Broglie to propose his concept of matter waves.
 b) Derive an expression for the de Broglie wavelength of an electron.
 c) Describe the experimental verification of matter waves using Davisson-Germer experiment.   [6+4+6]

8.a) Discuss with suitable mathematical expressions, the motion of an electron in a periodic potential.
 b) Explain how the above theory leads to the concept of band structure of solids.
 c) What is effective mass of electron?   [8+4+4]

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Code.No: R05010201 | R05 | SET-4

I - B.TECH EXAMINATIONS, DECEMBER - 2010
APPLIED PHYSICS
(COMMON TO EEE, ECE, CSE, EIE, BME, IT, E.CON.E CSS, ETM, ECC, ICE)
Time: 3hours   Max.Marks:80
Answer any FIVE questions
All questions carry equal marks
- - -

1.a) Explain the terms:
   i) Spontaneous emission and   ii) Stimulated emission.
 b) Distinguish between Ruby laser and He-Ne laser.
 c) Write the applications of lasers in medical field.   [4+8+4]

2.a) Explain, in detail, the basic principle of an optical fibre.
 b) Derive an expression for acceptance angle an optical fibre.
 c) Write the application of optical fibre in medical field.   [6+6+4]

3.a) Explain the formation of covalent solid, with a suitable example.
 b) Compare the properties of ionic and metallic solids.
 c) What is Madelung constant?   [8+5+3]

4.a) Derive Bragg's law of crystal diffraction.
 b) Describe in detail, powder method to determine the crystal structure.
 c) Calculate the glancing angle at which X-rays with wavelength of 0.549 nm are
    reflected in second order from a crystal with interplanar separation of 0.423 nm.
                                                                       [5+7+4]

5.a) Mention the ideas which prompted de Broglie to propose his concept of matter
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 b) Derive an expression for the de Broglie wavelength of an electron.
 c) Describe the experimental verification of matter waves using Davisson-Germer
    experiment.   [6+4+6]

6.a) Discuss with suitable mathematical expressions, the motion of an electron in a
    periodic potential.
 b) Explain how the above theory leads to the concept of band structure of solids.
 c) What is effective mass of electron?   [8+4+4]

7.a) Obtain the relevant mathematical expressions for:
    i) Electronic Polarizability and
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 b) Distinguish between ferroelectrics and piezoelectrics.   [10+6]

8.a) Explain in detail, the properties of superconducting materials.
 b) What is BCS theory? Enumerate the important results of BCS theory.
 c) Describe the applications of superconductors in various fields.   [6+6+4]

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