HTNO										

MLR 16

Code No: A2HS06

MLR INSTITUTE OF TECHNOLOGY

(An Autonomous Institution)

I B.Tech I Sem Regular Examinations, December -2016

APPLIED PHYSICS

(Common to All Branches)

Time: 3hours Max.Marks:75

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 25 marks. Answer all Questions in Part A.
3. Part B consists of 5 units. Answer any one full question from each unit.
Each question carries 10 Marks and may have a,b,c as sub sections.

PART-A

1. a) Define measurand and resolution. (2M)
   b) Draw the structure of FCC and write its coordination number and effective number of atoms per unit cell. (2M)
   c) Draw hysteresis loop indicating retentivity and coercive-field. (2M)
   d) Define pumping. (2M)
   e) Define Interference and Diffraction. (2M)

2. a) Distinguish between accuracy and precision. (3M)
   b) What is primitive cell and state whether FCC is a primitive cell or not justify your answer. (3M)
   c) What are Polar and Non Polar dielectrics? (3M)
   d) What is need of cavity resonator in laser system? (3M)
   e) Distinguish between microscope and telescope. (3M)

PART-B

3. a) Mention different types of errors with examples. (5M)
   b) A rectangular board is measured with a scale having accuracy of 0.3 cm. The length and breadth are measured as 40.5 cm and 21.5 cm respectively find the relative error and percentage error of the area calculated. (5M)

(OR)

4. a) Explain the propagation of error with example of wheatstone bridge. (5M)
   b) The mass and density of solid sphere are measured to be (15.5±0.2) kg and (5.5±0.1) kg/m^3calculate the volume of the sphere with error limits. (5M)

5. a) Describe with suitable diagram the powder method for determination of crystal structure(5M)
   b) What are Miller Indices? How they are obtained? (5M)

(OR)

6. a) Derive an expression for interplanar spacing between two adjacent planes of Miller indices (hkl) in a cubic lattice of edge length ‘a’. (5M)
   b) X-rays of wavelength 1.5418A° are diffracted by (111) planes in a crystal at an angle 30° in the first order. Calculate the interatomic spacing. (5M)

7. a) Explain Electronic polarization and derive an expression for electronic polarizability. (5M)
   b) Derive claussius Mosotti relation. (5M)

(OR)

8. a) Explain the terms Magnetic induction susceptibility, Permeability and Magnetic field intensity. (5M)
   b) In a magnetic material of the field strength is found to be 10^6 A/m . If the magnetic susceptibility of the material is $0.5x10^{-5}$, calculate the intensity of magnetization and flux density in material. (5M)

9. a) Explain the construction and working of He Ne Laser. (5M)
   b) Distinguish between spontaneous and stimulated emissions. (5M)

(OR)

10. a) Derive the relation between probabilities of spontaneous emission and stimulated emission in terms of Einstein coefficients. (5M)
    b) Mention some important applications of lasers. (5M)

11. a) Explain Diffraction Grating and calculate maximum number of orders possible with a Grating. (5M)
    b) How many orders will be visible if the wavelength of light is $5000A°$ and the number of lines per centimeter on the grating is 6655? (5M)

(OR)

12. a) Classify UV rays , Gamma rays and Microwaves . (5M)
    b) Distinguish between simple and compound micro scope. (5M)

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