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Total No. of Questions : 6] [Total No. of Printed Pages : 6

EXS-84

B. Tech. II[nd] Semester (CSE, IT & Elect.)

Examination, 2023

Paper - BE - 201

Engineering Physics

Time : 3 Hours] **[Maximum Marks : 60**

Note : - Answer all questions. There is internal choices within the questions.

1. Attempt objective questions. 10

(a) According to wave mechanics a material particle is associated with :

(i) asingle wave

(ii) a wave packet

(iii) Progressive Wave

(iv) Light Wave

(b) Newton's Ring illustrates the phenomenon of

(i) Interference

(ii) Diffraction

(iii) Polarization

(iv) Dispersion

(c) The conductivity of a Super conductor is :

(i) Infinite

(ii) Zero

(iii) Finite

(iv) None of these

(d) In a fibre light travels in

(i) Core medium

(ii) Cladding Medium

(iii) Air Medium

(iv) Buffer Medium

(e) Ruby laser emits light of wavelength

(i) 6943 A^0

(ii) 2000 A^0

(iii) 9000 A^0

(iv) 8370 A^0

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2. (a) The electron is confined to a box of length 10^{-8}m. Calculate the Minimum uncertainty in its velocity. 3

OR

Calculate the energy required to jump an electron from ground state to the second excited state in a metal.

(b) Explain group velocity and phase velocity and derive the relation between them. 7

OR

Find eigenvalues and eigenfunctions for a particle in one dimensional infinite potential well.

3. (a) In a grating spectrum. Which spectral line in 4th order will overlap with 3rd order line of 5461 A^0? 3

OR

In Newton's Ring experiment the diameters of the 4th and 12th dark rings are 0.400 cm. and0.700 cm respectively. Fine the diameter of the 20th dark Ring.

(b) Describe the construction and working of michelson interferometer. 7

OR

Derive an expression for the resolving power of a grating.

4. (a) A cyelotron with its dees of radius 2m has a magnetic field of 0.75 wb/m^2. Calculate the maximum energies to which protons can be accelerated? 3

[mp = 1.67×10^{-27} kg]

OR

A GM counter wire collects 10^8 electrons per discharge. when the counting rate is 500 counts/minute. What will be the average current in the circuit?

(b) Describe the construction and working of GM counter. 7

OR

Explain construction. Principle and working of betatron and what is betaron condition.

5. (a) Explain in brief the concept of fermilevel. 3

OR

What do you understand by intrinsic and extrimsic semi conductors?

(b) Explain Hall effect and give two of its applications. 7

OR

Explain the different types of super conductors.

6. (a) Describe the principle on which optical fiber works. 3

OR

Explain the principle of laser.

(b) What is Ruby Laser? Describe the construction and action of the ruby laser. 7

OR

What is Einstein coefficient? Derive Einstein relation.

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