Total No. of Printed Pages:3

SUBJECT CODE NO:- H-485
FACULTY OF SCIENCE AND TECHNOLOGY
F. E. (All)
Engineering Physics
(REVISED)

[Time: Three Hours] **[Max.Marks: 80]**

Please check whether you have got the right question paper.

N.B
1. Attempt Q.No.1 from section A and Q.No.6 from section B are compulsory.
2. Solve any two questions from the remaining questions from each section A and B.
3. Figures to the right indicate full marks.
4. Use of non-programmable calculator is allowed.

Section A

Q.1 Attempt any five questions from the following. 10

a) Define Canal rays.
b) Distinguish between characteristic and continuous spectra.
c) Write the engineering application of interference.
d) What is mean by resolving power of diffraction grating?
e) Define the term specific rotation.
f) Write the application of superconductor.
g) Write the properties of ferromagnetic materials.
h) What is mean by Compton Effect?

Q.2 a) Describe working of CRT with neat labeled diagram. 06

b) Deduce the expression of Compton shift in the form of frequency. 06

c) Electron is accelerated by a potential of 500 V enter the electric field at an angle of incidence 60^0 and makes an angle of 45^0 while entering in another region. Find the potential difference between two fields. 03

Q.3 a) Prove that for Newton's rings in reflected light the diameters of dark rings are proportional to the square root of natural numbers and the diameters of bright rings are proportional to the square roots of odd integers. 06

b) Explain the theory of plane diffraction grating. Obtain the condition for maxima and minima of the diffraction pattern. 06

c) Calculate thickness of mica plate required to make a quarter wave plate and half wave plate for light of wavelength5890 A^0. Given $\mu_o = 1.586$ *and* $\mu_e = 1.592$ 03

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Q.4 a) Write the silent feature of BCS theory. 05

b) State and explain Meissner effect. 05

c) What are ferromagnetic materials? Explain the important properties of ferromagnetic materials. 05

Q.5 Write a short notes on: 15

a) Hysteresis Loop
b) Aston mass spectrograph
c) Michelson's interferometer

Section B

Q.6 Attempt any five questions from the following. 10

a) Write the expression of Fermi-Dirac distribution function.
b) What is mean by Raman Effect?

c) Define:-
   i. Acceptance cone
   ii. Numerical aperture

d) Write the importance of Hall Effect.
e) What do you mean by lasers? Define spontaneous and stimulated emission.
f) Write the properties of Ultrasonic waves.
g) Define the terms absorption coefficient and echo.
h) How is the Nanotechnology used in textile?

Q.7 a) What is mean by forbidden gap? Deduce the expression for Fermi level in intrinsic semiconductor. 06

b) Derive Schrodinger time base wave equation. 05

c) State and explain Raman Effect. 04

Q.8 a) Explain the construction and working of solid state laser. Write its drawbacks. 06

b) Write the frequency range of ultrasonic waves? Explain any one method of production of ultrasonic waves. 05

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c) Typical an optical fiber and its cladding have refractive indices of 1.5 and 1.4 respectively find out 04
   i. Numerical aperture
   ii. Acceptance angle and
   iii. Critical angle

Q.9 a) Describe sol-gel method for synthesis of nanoparticles. 05

b) Write any 3 of each mechanical and electrical application of CNT. 05

c) Describe the use of nanotechnology in cosmetics and agriculture. 05

Q.10 Write a short notes on: 15

a) Explain the important any 2 applications of CNT's
b) Pumping mechanism
c) Fermi-Dirac distribution function.

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