Total No. of Printed Pages:2

SUBJECT CODE NO:- P-186
FACULTY OF ENGINEERING AND TECHNOLOGY
F. E. (All) (CGPA) Examination May/June 2017
Engineering Physics
(Revised)

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

"Please check whether you have got the right question paper".

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

Section A

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

a) State Beth's law. Write its formula.
b) What is velocity selector? Write its function?
c) What is Compton Effect?
d) Explain diffraction of x-Rays.
e) What are constructive and destructive interference?
f) Define the terms
   i) Optical activity
   ii) Specific rotation
g) What is isotope effect?
h) Write any four applications of magnetic materials.

Q.2
a) Discuss Thomson's parabolic method. to determine q'/m' of positive rays, where q' and m' are charge and mass of positive rays respectively. 07
b) State and explain Bragg's Law 05
c) The spacing between the principal planes of NaCl crystal is 2.82 A°. What is the wave length of x-rays, when the first order Bragg's reflection is observed at an angle of 10° ? 03

Q.3
a) Obtain an expression for diameter of n^{th} dark and bright ring 06
b) Explain theory of plane transmission grating 05
c) Explain i) Quarter wave plate ii) half wave plate 04

Q.4
a) Give the salient points of BCS theory 05
b) State and explain Meissner effect. 05
c) What are parametric materials? Explain the important properties of parametric materials. 05

Q.5 Write a short notes on
a) Bain bridge mass spectrograph. 05
b) Michelson's interferometer. 05
c) Hysteresis Loop 05

Section B

Q.6 Attempt any five question from the following 10

a) What is hall effect & write true formula for hall voltage.
b) State Heisen berg's uncertainty principle.
c) Distinguish between spontaneous and stimulated emission
d) Define i) acceptance angle, ii) Numerical Aperture.
e) Define absorption co-efficient. Write Sabine's formula.
f) What are the properties of ultra-sonic waves
g) What is CNT?
h) Explain the use of Nano particles in space and defence.

Q.7 a) What is Fermi energy? Obtain an expression for Fermi level in intrinsic semiconductor. 06
b) State and explain Raman effect 05
c) Derive Schrodinger time Independent wave equation 04

Q.8 a) Explain the construction and working of Ruby Laser. Write its disadvantages. 06
b) What are ultra-sonic waves? Explain the production of ultra-sonic waves by magnetostriction method 06
c) A cinema hall of volume 2500 m^3 and have a reverberation time 2sec. If the absorbing surface in the hall is 1660m^2. Calculate the absorption co-efficient. 03

Q.9 a) Explain the sol-gel method for synthesis of nanoparticles. 05
b) Explain the different properties of C N T 05
c) Explain the use of nanotechnology in textile and cosmetics 05

Q.10 Write a short note on 15

a) Fermi-dirac distribution function
b) Write a short note on
3-level and 4-level Pumping schemes
c) Explain the important applications of CNT'S