Printed pages:2	AG103
(Following paper code and roll No. to be filled in your answer book)	
Paper code: 180103	Roll No.

B TECH
(SEM I) THEORY EXAMINATION 2014-15
ENGINEERING PHYSICS

TIME: 3 Hours **Total Marks: 100**

SECTION-A

Q.1 All parts of this question are compulsory (2x10=20)

a. State and explain Heisenberg uncertainty principle.
b. Define specific rotation.
c. Give the physical significance of wave function.
d. Explain the diffraction of x-rays.
e. Define surface tension and contact angle.
f. What are the different sources of coherent?
g. Write short note on diffraction gratings.
h. What is the concept of matter waves?
i. What do you mean by critical velocity?
j. Define stimulated emission of radiation.

SECTION-B

Q.2Attempt any three parts of the following: (10x3=30)

a. What is coefficient of viscosity? Describe Poiseullie's equation for flow of liquid through a tube.
b. Discuss the phenomena of interference of light in thin films and find the condition of maxima and minima.
c. Explain with a neat diagram, how determine the surface tension of a liquid by jager's method.

d. Explain construction and working of He-Ne laser and gives also its application.

SECTION – C

Q.3Attempt any five parts of the following: (10x5=50)

a. Derive time independent Schrodinger wave equation. What happens if the particle is free?
b. Discuss Langevine's theory of diamagnetism.
c. Explain diamagnetism, paramagnetism, ferromagnetism on the basis of magnetic dipoles of the atoms.
d. Establish relation between Einstein A and B coefficients. Calculate the population ratio of two states in He-Ne laser that produce light of wave length $6000A^0$ at 300K.
e. Discuss Michelson's interferometer and mention its outcome.
f. **Distinction between-**
  i) Metal and Insulator
  ii) Conductor and Semi-conductor
  iii) Intrinsic and extrinsic semiconductor
  iv) Stream and turbulent flow
g. (i) Determine energy band gap in semi-conductor.
ii) Find the thickness of a quarter wave plate for the wavelength of light 589nm and μ_o=1.55 and μ_e =1.54.
h. (i) Show that :- **P = 4 S/r** Where P = Pressures, S = Surface tension and r = radius of spherical bubble.
ii) What is difference between stimulated and spontaneous emission.