

Roll No.

24003

**B. Tech 1st Semester (Common for All
Branches) Examination – December, 2017**

PHYSICS - I

Paper : Phy-101-F

Time : Three Hours] [Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is *compulsory*.

1. (a) Why Newton's rings are circular ?
- (b) What is Rayleigh's limit of resolution ?
- (c) Discuss silent characteristics of Laser ?
- (d) What is polarized and unpolarized light.
- (e) Give some application of fibre optics.
- (f) What is isotopic effect in superconductor ?
- (g) Why high frequency lasers are difficult to construct ?

24003-13150-(P-3)(Q-9)(17)

P. T. O.

- (h) The binding energy of electron to proton (i.e. of hydrogen atom) is 13.6 MeV. Find the loss of mass in the formation of one atom.
- (i) For a gas the value of dielectric constant at 0° C is 1.000038 .calculate the electric susceptibility (χ_e) at this temperature.
- (j) What is Meissner effect ? $2 \times 10 = 20$

UNIT – I

2. What are the Newton's rings ? Why they are circular ? Explain the formation of Newton's rings in reflected light ? <http://haryanapapers.com> 20
3. Difference between Fraunhofer and Fresnel diffraction. Explain the phenomenon of diffraction - through a single slit. 20

UNIT – II

4. (a) Discuss Einstein's coefficients. Derive relation between them. 12
- (b) Write a short note on semiconductor laser ? 8
5. (a) Give the construction and working of a Lorentz half shade polarimeter. What is main drawback ? 15
- (b) What is difference between spontaneous and stimulated emission ? 5

24003-13150-(P-3)(Q-9)(17) (2)

UNIT – III

6. (a) State and prove gauss law in-dielectrics ? 10
- (b) Deduce an expression for energy store in dielectric in electrostatic field. 10
7. What is acceptance angle and numerical aperture ? Discuss in detail the various modes in fiber optics. 20

UNIT – IV

8. (a) What is the postulate of special theory of relativity ? Using them, derive equation of variation of mass with velocity. 15
- (b) If kinetic energy of a body is twice to rest mass energy. Find out its velocity. 5
9. Drive the London equations and discuss how its solution explains Meissner effect. 20

24003-13150-(P-3)(Q-9)(17) (3)