10051

B

Reg. No. : ..... Name : .....

SECOND SEMESTER B.TECH. DEGREE EXAMINATION, MAY/JUNE 2016

PH 100 : ENGINEERING PHYSICS

Max. Marks : 100 Duration : 3 Hours

PART – A

Answer **all** questions. **Each** question carries **2** marks.

1. Distinguish between free oscillation and damped oscillation.
2. State the laws of transverse vibrations of a stretched string.
3. What do you mean by optical path ?
4. What is grating element ? Write the grating equation in terms of grating element.
5. What is a Retardation plate ? Write the expression for the thickness of a QWP and HWP.
6. What is DC Josephson effect ?
7. How do you account for the natural line broadening on the basis of Heisenberg's Uncertainty principle ?
8. What do you mean by Fermi energy level and Fermi energy ?
9. Distinguish between reverberation and echo.
10. How ultrasonic waves are detected by thermal method ?
11. How population inversion is achieved in Ruby laser ?
12. Explain the principle of propagation of light through an optical fibre. **(12×2=24)**

PART – B

Answer **any 10** questions. **Each** question carries **4** marks.

13. What are the conditions for oscillations of a harmonic oscillator to be over damped, critically damped and under damped ? Compare the time – displacement curve in the three cases.

14. A piece of wire 50 cm long is stretched by a load of 2.5 kg and has a mass of 1.44 g. Find the frequency of the second harmonic.

15. Light of wave length 6000 Å falls normally on two glass plates enclosing a wedge shaped film. The plates touch at one end and are separated at 10 cm from that end by a wire. If the bandwidth of the interference pattern is 0.05 mm, find the diameter of the wire.

16. Light of wave length 589.3 nm is incident normally on a plane transmission grating having 6000 lines/cm. Calculate the angle at which the principal maxima of the first order is formed.

17. How do you distinguish circularly polarized light from un polarized light ?

18. Write any four applications of superconductors.

19. What are the conditions to be satisfied by a wave function ?

20. What is phase space ? With the help of Heisenberg's Uncertainty relation, show that the minimum size of the unit cell in quantum statistics is hf, where h is the Planck's constant and f is the degree of freedom of the system.

21. The dimensions of an auditorium are 60 m × 15 m × 10 m and its interior surfaces have an average absorption co-efficient of 0.25.Find the reverberation time of the auditorium.

22. Given that the velocity of ultrasonic waves in sea water is equal to 1440 m/s. Find the depth of a submerged submarine, if ultrasonic pulses reflected from the submarine is received 0.33 s after sending ultrasonic waves.

23. With the help of a neat diagram explain how a hologram is recorded.

24. A fibre cable has an acceptance angle of 30° and a core of refractive index 1.4. Calculate the refractive index of the cladding.