

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**B.Tech., Winter 2017 - 18 Examination**

**Semester: 1, 2**  
**Subject Code: 03192101**  
**Subject Name: Physics**

**Date: 11/01/2018**  
**Time: 02:00PM to 04:30PM**  
**Total Marks: 60**

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1 Objective Type Questions - (All are compulsory) (Each of one mark) (15)**

1. Which out of the following is not the component of LASER?  
 a) Active Medium      b) Pumping      c) resonator      d) electric bulb
2. \_\_\_\_\_ prevents moisture from coming into contact with fibre.  
 a) Polyurethane      b) polyester      c) Polystyrene      d) polyfibre
3. \_\_\_\_\_ is not the unit of Pressure.  
 a) bar      b) torr      c) pascal      d) newton
4. An electron moving with velocity  $3 \times 10^6$  m/s. De Broglie wavelength associated with it is  
 \_\_\_\_\_  
 a)  $2.43 \times 10^{-10}$       b)  $2.43 \times 10^{-9}$       c)  $2.43 \times 10^{10}$       d)  $2.43 \times 10^9$
5. Light doesn't behave like a particle in \_\_\_\_\_  
 a) Black Body Radiation      b) Photo Electric Effect      c) Compton Effect      d) Interference
6. Define Coulomb's law.
7. Define Superconductor.
8. Define Reverberation time.
9. State principle of Fuel Cells.
10. Define Nanotechnology.
11. Unit of Loudness is \_\_\_\_\_
12. Frequency of Ultrasonic sound is always greater than \_\_\_\_\_
13. Vacuum level is measured in \_\_\_\_\_ unit.
14. Critical temperature of mercury is \_\_\_\_\_
15. \_\_\_\_\_ is the active medium of Nd-YAG Laser.

**Q.2 Answer the following questions. (Attempt any three) (15)**

- A) Discuss any three factors affecting the acoustics of building & give their remedies.
- B) Explain any one method of production of ultrasonic waves with necessary circuit diagram.
- C) Explain He:Ne laser with its principle, construction & energy level diagram.
- D) Derive the formula for acceptance angle and numerical aperture of an optical fiber.

**Q.3 A) Answer the following Questions**

- 1) Write three difference between diamagnetic and paramagnetic. (04)
- 2) What is Compton Effect? Write the equation for Compton shift in wavelength? (03)  
 A photon of wavelength  $3 \text{ \AA}$  strikes an electron at rest and scattered at an angle of  $45^\circ$  to its original direction. Find the wavelength of the photon after scattering.

- B) What is the advantage of using optical fibre over the conventional metallic cable. (08)

**OR**

**B) Answer the following Questions**

- 1) The critical temperature for a metal with isotopic mass 199.5 is 4.185 K. Calculate the isotopic mass if the critical temperature is 6 K. (03)
- 2) Calculate the critical temperature of a superconductor having critical magnetic field of 1000A/m at 7 K (Given: critical magnetic field at 0 K is 4000 A/m). (02)
- 3) Write four difference between classical physics and Quantum Physics (03)

**Q.4 A) Answer the following Questions**

- 1) A silica glass optical fiber has a core & cladding of refractive index 1.50 & 1.46 respectively. (03)  
Calculate a) Critical angle b) Acceptance angle c) Numerical aperture
- 2) Write Maxwell's equations and give their interpretation. (04)

**OR**

- A) Explain any method for synthesizing nanomaterial. (07)

**B) Answer the following Questions**

- 1) Explain Pirani Gauge (08)
- 2) Explain the Melt Spinning Technique.