S. B. Roll. No.....

APPLIED PHYSICS-II
2nd Exam/Common/2753/Dec'22
(For 2018 Batch Onwards)

Duration: 3Hrs. **M.Marks:75**

SECTION-A

Q1. a) Fill in the blanks. **15x1=15**

i. Refractive index of core is _____than refractive index of cladding in an optical fibre.
ii. In a PNP transistor, emitter-base junction is always_____
iii. Weber is the SI unit of measuring_____
iv. A Wheat Stone bridge is used to determine_____
v. The persistence of sound in a room or hall is called_____

b) State True or False.

vi. A laser is a coherent source because it contains many wavelengths.
vii. On doping, the conductivity of the semiconductor increases.
viii. Permeability is negative for paramagnetic substances.
ix. Ohm's law is valid when the temperature of the conductor is constant.
x. Inside a hollow spherical conductor, the potential is constant.

c) Multiple Choice questions:

xi. Loss of optical power in the fibre is called a) Attenuation b) friction c) viscosity d) none of these
xii. Diffusion of free electrons across the junction of an unbiased diode produces
a) Forward bias b) reverse bias c) break down d) depletion layer
xiii. To increase the range of a voltmeter, we needed to connect a suitable a) High resistance in series
b) High resistance in parallel c) Low resistance in series d) Low resistance in parallel
xiv. Conductivity is the reciprocal of a) Current b) Resistivity c) Resistance d) Current density
xv. To have a large magnifying power of an astronomical telescope, we should have focal length of Eye-lens
a) Infinity b) Large c) Small d) any value

SECTION-B

Q2. Attempt any six questions. **6x5=30**

a. Derive lens formula for concave lens.
b. Define an electric line of force. Also give the properties of electric lines of force.
c. Resistance 50, 60 and 70 ohm are connected in parallel and the combination is connected in series with a 2 ohm resistance across a battery of 50 V. Find the equivalent resistance and current in the circuit.
d. How will you convert the given galvanometer into a voltmeter of range 0-V.?
e. Distinguish between intrinsic and extrinsic semiconductor.
f. Give any five applications of lasers.
g. State and prove Gauss's law

SECTION-C

Attempt any three questions. **3x10=30**

Q3. a) Derive an expression for velocity and acceleration of particle executing Simple harmonic motion. Also show their graphical variation with time. **7**
b) A tuning fork vibrates with the frequency of 350 hertz to produce sound waves which travel through air with the velocity of 330m/s. What is the wavelength of sound produced? **3**

Q4. a) With the help of suitable ray diagram, explain the working of astronomical telescope. Define its magnifying power. Also prove that in case of its normal adjustment, m= Fo/Fe, where Fo is the focal length of objective lens and Fe is the focal length of eye-piece. **7**
b) Define the following terms: i) Resistance ii) Current iii) Potential Difference. **3**

Q5. a) Compare the properties of diamagnetic, paramagnetic and ferromagnetic materials **5**
b) Differentiate between insulators, conductors and semiconductors by using band theory. Also give two examples of each. **5**

Q6. Explain the principle, construction and working of helium- neon (He-Ne) laser. **10**