Total No. of printed pages = 6

RETEST EXAMINATION – 2019

Semester : 2nd (New)

Subject Code: Sc-204

APPLIED PHYSICS – II

Full Marks –70

Time – Three hours

The figures in the margin indicate full marks for the questions.

PART – A

Marks –25

Instructions :

1. Questions on PART – A are compulsory.
2. Answer any *five* questions from PART – B.

1. Fill in the blanks : 1×10=10

   (a) A ——— image can be taken on a screen.

   (b) In an optical fibre, light travels due to the phenomenon of ———.

   (c) Magnetic poles always exit in ———.

   (d) N/C is the SI unit of ———.

[Turn over

(e) The unit of current is ——.

(f) Resistance of a conductor —— with increase in temperature.

(g) SI unit of specific resistance is ——.

(h) Laser is based upon the principle of —— emission.

(i) —— are the minority carriers in p-type semiconductors.

(j) Pure semiconductors are also known as ——.

2. Write true or false : 1×10=10

(a) Virtual image formed by a convex mirror is always enlarged.

(b) Greater the wavelength of light, smaller is the critical angle.

(c) The angle of dip is the same everywhere on earth.

(d) Electric current is a vector quantity.

(e) Conductivity is the reciprocal of resistivity.

(f) The algebraic sum of currents at any junction is zero.

(g) Alpha rays have positive charge.

(h) He-Ne laser is a solid laser.

(i) Ge is an n-type semiconductor.

(j) Electric conductivity of extrinsic semiconductor is very low.

3. Choose the correct answer : 1×5=5

(a) Unit of magnetic field is

(i) Newton (ii) Tesla

(iii) Henry (iv) Joule

(b) A voltmeter is used to measure

(i) Potential difference

(ii) Electric current

(iii) Resistance

(iv) Magnetic field

(c) Commercial unit of electric energy is

(i) Horse power (ii) Kilowatt-hour

(iii) Joule (iv) Ampere-secon

(d) 1 Tesla is

(i) 10^5 Gauss (ii) 10^4 Gauss

(iii) 10^8 Gauss (iv) 10 Gauss

(e) Size of an atom is

(i) 10^{-6} m (ii) 10^{-8} m

(iii) 10^{-10} m (iv) 10^{-14} m

PART – B

Marks – 45

4. (a) State the laws of reflection. Define real and virtual images. 2+2=4

(b) Draw a ray diagram to show the formation of an image of an object placed

(i) between F and 2F and

(ii) at F in a convex lens. 2+2=4

(c) Velocity of light in vacuum is 3×10^8m/s and that in water is 2.25×10^8m/s. Find the refractive index of water. 1

5. (a) What is an Optical fibre ? Describe its parts. 1+2=3

(b) Deduce the relation between electric potential and electric intensity. 3

(c) State and explain Coulomb's law. What do you mean by an electric potential ? 2+1=3

6. (a) What is a capacitor ? What is its primary function ? 1+1=2

Calculate the charges on condensers 2μF and 3μF capacity connected in parallel when a potential difference of 100 V is applied across them. 3

(b) What is an uniform magnetic field ?

(c) Deduce the relation between electric potential and electric intensity.

7. (a) Define magnetic induction and give its SI unit. What do you mean by electric potential ? 2+1=3

(b) State Ohm's law and hence define resistance. 2

(c) Write the differences between primary and secondary cells. A wire of length 1m and radius 0.1 mm has a resistance of 100 ohm. Find the resistivity of the material. 2+2=4

8. (a) What do you mean by Thermo electricity ? Define Peltier effect and Thomson effect. 1+2=3

(b) Define Lenz's law and explain it. What is the unit of electric field ? State Faraday's laws of electromagnetic induction. 2+1+3=6

9. (a) What is stimulated emission ? Explain the principle of a LASER. 1+3=4

(b) Write three differences between p-type and n-type semiconductors. Explain the formation of energy bands in solids. 3+2=5