Total No. of printed pages = 7

Sc-204/AP-II/2nd Sem/2017/N

APPLIED PHYSICS – II

Full Marks – 70

Time – Three hours

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

PART – A

Marks – 25

1. Fill in the blanks with appropriate words : $1 \times 8 = 8$

   (a) The focal length of a plane mirror is _____.

   (b) Watt hour is unit of _____.

   (c) Ampere is the S I unit of _____.

   (d) Two electric lines of force _____ intersect each other.

(e) In a _____ magnetic field, the lines of force are parallel straight lines.

(f) Bar magnet have _____ poles.

(g) There are _____ electrodes in a diode.

(h) X-rays have frequencies _____ than that of visible light.

2. Select the True and False statements from the following : 1×8=8

(a) A convex mirror always produces and virtual and diminished image of an object.

(b) Coulomb is the S.I unit of electric current.

(c) Light consist of photons.

(d) Electric potential is measured in Volt.

(e) Electric cell converts chemical energy into electric energy.

(f) Plane mirror always produces a real image.

(g) Angle of deviation increases with the increase of angle of incident.

(h) Angle of dip is zero at the two poles of earth.

3. Choose the correct answer of the following : $1 \times 9 = 9$

(a) Which of the following mirror always produces a virtual and same size of image of an object ?

(i) Concave mirror

(ii) Convex mirror

(iii) Plane mirror

(b) Three resistors of resistances 1 Ohm when connect in series gives resistance of

(i) 30 Ohm

(ii) 3 Ohm

(iii) 0.3 Ohm

(c) Unit of capacity of a conductor is

(i) Farad (ii) Henry

(iii) Volt (iv) Ampere

(d) The S.I unit of resistance is

(i) Ohm (ii) Ampere

(iii) Volt (iv) Henry.

(e) X-rays consist of

(i) photon

(ii) electron

(iii) positively charged particle

(f) The resistance of a conductor

(i) increases

(ii) decreases

(iii) remains same with increase of temperature.

(g) The direction of induced e.m.f is obtained from

(i) Ohm's law

(ii) Lenz's law

(iii) Kirchhoff's law

(h) Photo-electric effect proves that

(i) light has constant velocity

(ii) light is quantum in nature

(iii) light waves are transverse in nature

(iv) light is part of electromagnetic waves

(i) Which of the following should be used as a rear view mirror in automobiles ?

(i) convex mirror

(ii) plane mirror

(iii) concave mirror

(iv) parabolic mirror.

PART – B

Marks – 45

Answer any *five* questions : 9×5=45

4. (a) What is image ? Differentiate between a real image and virtual image. 3

(b) Define critical angle and hence explain total internal reflection of light with neat diagram. 4

(c) A glass prism has refracting angle 60°. The angle of minimum deviation of a ray passing through it is 40°. Find the refractive index of the prism. (Given, Sin 50 = 0.766) 2

5. (a) Define electrostatic potential and hence obtain an expression for electric potential at any point due to a point charge. 3

(b) State Ohm's law with mathematical expression and hence define resistance. 3

(c) What are the main defects of a simple voltaic cell ? Explain them. 3

6. (a) Find an expression to calculate the magnetic intensity at point on the end on position of a short bar magnet. 4

(b) Calculate the equivalent resistance when three resistors of 2 Ohm, 3 Ohm and 5 Ohm are connected in parallel. 2

(c) Define power of a lens. Determine the power of a convex lens of focal length 20 metre. 1+2=3

7. (a) State Faradays law of electromagnetic Induction. What is Lenz's law ? 3

(b) How diode can be used as a half wave rectifier ? 3

(c) What is photoelectric effect ? Deduce Einstein's photoelectric equation. 3

8. (a) What do you mean by earth magnetism ? Define dip and inclination. 1+2=3

(b) State and explain Kirchhoff's law. 3

(c) Define magnetic lines of force. State some properties of magnetic lines of force. 1+2=3

9. (a) Define atomic mass unit, mass defect and binding energy. 3

(b) State three properties of each and ray. 3

(c) Explain how a N-type semiconductor can be prepared. 3