Total No. of printed pages = 5

Sc-204/AP-II/2nd Sem/2013/N

APPLIED PHYSICS – II

Full Marks – 70

Pass Marks – 21

Time – Three hours

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

Answer question No. 1 and any *five* from the rest.

1. A. Choose the correct answer of the following : 1×5=5

(a) The SI unit of electric current is

(i) Joule

(ii) Ampere

(iii) Coulomb

(iv) Ohm.

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

(i) Ohms law

(ii) Lenz's law

(iii) Kirchoff's law

(iv) None of these.

[Turn over

(c) The focal length of concave mirror is

(i) positive

(ii) negative

(iii) infinity

(iv) depends on the position of the object.

(d) A p-type semiconductor has

(i) more electrons than hole

(ii) holes more than electrons

(iii) same number of elections and holes

(iv) None of the above.

(e) When air is replaced by any other medium, the force between two charges

(i) increases

(ii) decreases

(iii) remains the same

(iv) may increase or decrease depending on the medium.

B. Fill in the gaps : $1 \times 5 = 5$

(a) —— image can be photographed.

(b) The kilowatt hour is the practical unit of ——.

(c) Electrical conductivity is the ——— of resistivity.

(d) Two magnetic lines of forces never ——— each other.

(e) X-rays have —— charge.

2. (a) What is an optical image ? How do you differentiate a real image from a virtual image ? 1+3=4

(b) The refracting angle of a prism is 60^{o} and the minimum deviation of a ray through the prism is 40^{o}. Calculate the refractive index of the prism. 4

(Given $\sin 50^{o} = 0{\cdot}0776$)

(c) Find the position, nature and size of the image formed when an object of height 10 cm is placed 30 cm in front of a converging mirror of radius of curvature 40 cm. 4

3. (a) Distinguish between primary cell and secondary cell. 3

(b) State Joules law of heating effect. 3

(c) Define neutral temperature and temperature of inversion. 2

(d) Obtain an expression to calculate the equivalent resistance when a number of resistances are connected in parallel. 4

4. (a) What are the elements of earth's magnetic field ? Define each of them. 1+3=4

(b) Find the potential duc to a bar magnet for a point lying on equitorial line (broad side on position). 4

(c) State and explain Coulomb's law of electro-static force between two point charges with mathematical expression. Define a Coulomb of charge. 3+1=4

5. (a) What is photo-electric emission ? The work function of a metal is 3·3 eV. Calculate the threshold frequency for the metal. Given $h = 6.6.10^{-34}$ J.S. 2+2=4

(b) Define electric intensity and electric potential. 3

B.

(c) What do you mean by electro-plating ? 2

(d) Define electro-chemical equivalent and Faraday constant. 3

6. (a) Distinguish between potential difference and e.m.f of a cell. 2

(b) What are the laws of electro-magnetic induction ? 3+2=5

Define the coefficients of self induction and mutual induction.

(c) What is a diode ? Explain how a diode valve can be used as a rectifier. 2+3=5

7. (a) What is radioactivity ? Mention some uses of X-rays in medical and technical field. 1+2=3

(b) State some properties of alpha, beta and gamma particles. 4

(c) State atomic mass unit and binding energy. 2

(d) What are intrinsic and extrinsic semi-conductors ? Give at least one example of each of them. 3