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**END SEMESTER REGULAR / RETEST
EXAMINATION, JULY – 2023**

Branch : Common

Semester : 2nd

Subject Code : Sc-204

APPLIED PHYSICS-II

Full Marks – 70

Time – Three hours

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

Instructions :

- (i) All questions of PART – A are compulsory.
- (ii) Answer any five questions from PART – B.

PART – A

Marks – 25

1. Fill in the blanks :

1×5=5

- (a) The unit of power of a lens is _____.
- (b) A _____ can produce a virtual image smaller than the object.

[Turn over

(c) Kirchoff's 1st law is applicable to _____ in a network.

(d) Tesla is the unit of _____.

(e) A laser beam consists of highly _____ photons.

2. State True or False : 1×5=5

(a) Holes are majority charge carriers in n-type semiconductors. τ

(b) β particles are fast moving electrons. \mathcal{F}

(c) The neutron was discovered by Lord Rutherford. τ

(d) The commercial unit of power is horsepower. \mathcal{F}

(e) Thermoelectric effect is used in designing thermopile. τ

3. Fill in the blanks :

1×5=5

(a) _____ cell does not use a carbon plate.

(b) The minimum deviation in a prism depends on _____ of the prism.

(c) The focal length of a spherical mirror of radius of curvature 30 cm is _____.

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(d) The S.I unit of Potential is _____.

(e) Self inductance is the ratio of magnetic flux and _____.

4. State True or False : 1×5=5

(a) Photon is a quantum of matter. τ

(b) The number forces are charge dependent. τ

(c) Isotopes have same number of protons. τ

(d) Diode valve is mostly used as an amplifier. \mathcal{F}

(e) S.I unit of magnetic moment is Joule per Tesla. \mathcal{F}

5. Fill in the blanks : 1×5=5

(a) Primary cell cannot be _____.

(b) Validity of Ohm's law requires that _____ should be constant.

(c) The solution undergoing decomposition is called _____.

(d) Transformers works upon the principle of _____.

(e) A photocell is a device that absorbs _____.

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PART - B

Marks - 45

6. Differentiate between real and virtual image. An object is placed 30 cm from a convex lens. A real image is formed 20 cm from the lens. Find the focal length of the lens and its power. $3+6=9$
7. What is terrestrial magnetism? What are its causes? Describe Molecular theory of magnetism. A bar magnet of magnetic moment 5 Am^2 has poles 20 cm apart. Find the pole strength. $1+2+3+3=9$
8. Define electric field intensity. State Coulomb's law in electrostatics. Explain the principle of electrostatic capacitor. A sphere of radius 80 cm is charged to a potential of 1500V. Calculate the charge on the sphere and its electric energy. $1+2+2+4=9$
9. Differentiate between emf and potential difference. Describe the construction and theory of a Simple voltaic cell. Derive the relation between electric current and drift velocity. $3+3+3=9$

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10. Describe in details :

$3+3+3=9$

(i) Seebeck effect

(ii) Thomson effect

(iii) Peltier effect.

11. Explain the construction, working, and theory of a Transformer. Write few applications. State Faraday's law of e.m. induction. Define self and mutual inductance. $3+2+2+2=9$
12. Derive Einstein's photoelectric effect. Explain Laws of photoelectric emission. Explain the binding energy graph. $3+3+3=9$
13. Describe the working of a LASER. What is a LED? Describe the operation of a bridge rectifier. $4+2+3=9$

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