

KAMARAJ COLLEGE (Autonomous)

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(3 Pages)

Reg. No:.....

Question Code: 26E01213

Course Code : 25UEPH21

UG Degree - End Semester Examinations, April 2026

Second Semester

PHYSICS ALLIED

Allied Physics - II

(For those who joined in June 2025 onwards)

Time : 3Hours

Maximum : 75 Marks

PART - A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer:

- CO:1 1. Nicol prism is made from _____ crystal.
K:1 (a) Nickel (b) Calcium
(c) Calcite (d) Potassium
- CO:3 2. In Fraunhofer diffraction, the source and screen are at _____
K:2 distances from the aperture.
(a) Finite (b) Infinite
(c) Both a and b (d) None of the above
- CO:2 3. The maximum number of electrons in a shell is given as_____
K:2 (a) $2n$ (b) $n/2$
(c) $2n^2$ (d) $3n^2$
- CO:3 4. In a periodic table seven horizontal rows and eight vertical
K:1 columns are called as _____ and _____ respectively.
(a) Periods, Groups (b) Groups, Periods
(c) Parts, Groups (d) Periods, Grades
- CO:5 5. Mass defect of a stable nucleus is _____ the sum of the masses of
K:2 protons and neutrons.
(a) Less than (b) Greater than
(c) Less than or equal to (d) Equal to
- CO:2 6. The energy equivalent of a mass unit is _____ MeV.
K:5 (a) 931.49 (b) 9.3149
(c) 93.149 (d) 93149

- CO:4 7. Inertial frames are _____ reference frames.
K:1 (a) Accelerated (b) Unaccelerated
(c) Stable (d) Both a and b
- CO:5 8. Lorentz transformation reduces to Galilean transformation if the
K:2 velocity of the object is _____ the velocity of light.
(a) Less than (b) Greater than
(c) Equal to (d) None of the above
- CO:1 9. Zener diode acts as an ordinary semiconductor diode in _____ bias.
K:1 (a) Forward (b) Reverse
(c) Inverted (d) Both a and b
- CO:4 10. Rectifiers are used to convert _____ into _____.
K:2 (a) DC, AC (b) AC, Pulsating DC
(c) High DC, Low DC (d) Low AC, High AC.

PART - B (5 X 5 = 25 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 250 words.

- CO:2 11. (a) Differentiate between Fresnel and Fraunhofer Diffraction.
K:3
(OR)
(b) Distinguish between Interference and Diffraction.
- CO:1 12. (a) Infer the arrangement of elements in the third period of the
K:4 periodic table.
(OR)
(b) Infer the importance of atomic number and mass number in an atom.
- CO:3 13. (a) List the similarities between the nucleus and a liquid drop
K:4 model
(OR)
(b) Examine the binding energy of an alpha particle and express it in MeV. (Given mass of proton is 1.007276u, mass of neutron is 1.008665u and mass of alpha particle is 4.001506u)
- CO:5 14. (a) Investigate the frame of reference and its types.
K:5
(OR)
(b) Explain the postulates of special theory of relativity
- CO:4 15. (a) Analyze the working of Full wave rectifier.
K:4
(OR)

(b) Analyze the working of the NPN Transistor.

PART - C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 500 words.

CO:5 16. (a) Discuss the air wedge method for determining the thickness
K:6 of a thin wire.

(OR)

(b) Discuss an experiment to demonstrate the phenomenon of double refraction using Brewster's law.

CO:4 17. (a) Interpret various quantum numbers used in the vector atom
K:5 model.

(OR)

(b) Interpret Einstein's photoelectric equation and list its applications.

CO:1 18. (a) Explain radioactivity and list any three applications.
K:1

(OR)

(b) Explain the differences between Nuclear Fission and Fusion.

CO:3 19. (a) Derive an equation for Length Contraction and obtain the
K:4 condition for Lorentz-Fitzgerald contraction.

(OR)

(b) Derive an equation for time dilation using the inverse Lorentz transformation.

CO:2 20. (a) Illustrate the characteristics of p-n junction diode in detail.
K:4

(OR)

(b) Illustrate the characteristics of a Zener diode in detail.