

KAMARAJ COLLEGE (Autonomous)

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(3 Pages)

Reg. No:.....

Question Code: 26E01212

Course Code : 24UEPH21

UG Degree - End Semester Examinations, April 2026

Fourth Semester

PHYSICS ALLIED

Allied Physics Paper - II

(For those who joined in July 2024 onwards)

Time : 3Hours

Maximum : 75 Marks

PART - A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer :

- CO:1 1. The colors in thin films (like soap bubbles) are due to:
K:1 (a) Diffraction (b) Polarization
(c) Interference (d) Scattering
- CO:1 2. The instrument used to measure optical rotation in sugar
K:2 solutions is:
(a) Microscope (b) Spectrometer
(c) Polarimeter (d) Interferometer
- CO:2 3. Rutherford's scattering experiment proved the existence of:
K:1 (a) Electrons (b) Protons
(c) Atomic nucleus (d) Neutrons
- CO:2 4. The maximum number of electrons in an orbital is:
K:2 (a) 1 (b) 2
(c) 4 (d) 8
- CO:3 5. The liquid drop model explains:
K:1 (a) Nuclear stability and (b) Nuclear shell structure
fission
(c) Radioactive decay only (d) Beta decay only
- CO:3 6. Binding energy per nucleon is maximum for:
K:2 (a) H (b) U
(c) Fe (d) He

- CO:4 7. Newton's laws of motion are valid in:
K:1 (a) Only non-inertial frames (b) Only rotating frames
(c) Inertial frames (d) All frames of reference
- CO:4 8. The second postulate of special relativity states that:
K:2 (a) Light requires a medium for propagation
(b) Speed of light is constant in vacuum in all inertial frames
(c) Light speed depends on observer
(d) Light speed depends on wavelength
- CO:5 9. The potential barrier of a silicon diode at room temperature is
K:1 about
(a) 0.1 V (b) 0.3 V
(c) 0.7 V (d) 1.1 V
- CO:5 10. The voltage at which a Zener diode conducts heavily in reverse
K:2 bias is called:
(a) Knee voltage (b) Zener voltage
(c) Threshold voltage (d) Peak voltage

PART - B (5 X 5 = 25 Marks)

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

Answer should not exceed 250 words.

- CO:1 11. (a) Explain the difference between Diffraction and Interference
K:3
(OR)
(b) Examine the polarization of light
- CO:2 12. (a) Discuss the postulate of the Bohr atom model.
K:3
(OR)
(b) Explain the application of photoelectric effect
- CO:3 13. (a) Analyze the variation of average binding energy with the
K:4 mass number using graph and discuss about its features.
(OR)
(b) Calculate the energy released in nuclear reaction.
- CO:4 14. (a) Investigate the frame of the reference and their types.
K:4
(OR)
(b) Examine the time dilation.

CO:5 15. (a) Compare the forward and reverse bias.

K:5

(OR)

(b) Discuss the PNP transistor.

PART - C (5 X 8 = 40 Marks)

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

Answer should not exceed 500 words.

CO:1 16. (a) Explain with theory the method of finding thickness of the wire using air wedge arrangement.

K:3

(OR)

(b) Discuss the theory of diffraction grating. Describe an experiment to determine the wavelength of mercury spectrum.

CO:2 17. (a) Analyze the Pauli's exclusion principle

K:4

(OR)

(b) Examine the experimental setup to verify Einstein's photoelectric equation.

CO:3 18. (a) Explain liquid drop model

K:4

(OR)

(b) Examine the half-life period and mean life period.

CO:4 19. (a) Evaluate an expression for Lorentz transformation equations.

K:5

(OR)

(b) (i) Analyze the postulates of special theory of relativity.

(ii) Explain the length contraction.

CO:5 20. (a) Explain the construction and working of PN junction diode

K:5

(OR)

(b) Determine an experiment to draw the V-I characteristics of Zener diode.