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(6 pages)

Reg. No. :

Code No. : 20042 E

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AAPH 21

B.Sc. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Second / Fourth Semester

Physics — Allied

ALLIED PHYSICS — II

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Current density J is equal to

- (a) $\frac{I}{A}$ (b) IA
(c) $\frac{A}{I}$ (d) Am^2

2. If resistance decreases then current will

- (a) Increase (b) Double
(c) Decrease (d) Constant

3. Permeability μ is equal to

- (a) $\mu = \frac{B}{H}$ (b) $B = \mu H$
(c) $B = \mu_r \mu_o H$ (d) All

4. The unit of magnetic induction is

- (a) tesla (b) $Webm^{-2}$
(c) Both (a) and (b) (d) None

5. $I_E =$

- (a) $I_C \times I_B$ (b) $\frac{I_B}{I_C}$
(c) $I_B + I_C$ (d) None

6. $\overline{A \cdot B}$

- (a) $\overline{A} + \overline{B}$ (b) $\overline{A} \cdot \overline{B}$
(c) $\overline{B} \cdot \overline{A}$ (d) None

7. The radioactive elements emits
 (a) Electrons (b) Positrons
 (c) γ - rays (d) All
8. The relation between half - life time (τ) and mean life (T) of a radioactive substance is
 (a) $\tau = 2.718 T$ (b) $0.693 T$
 (c) $T = 0.693$ (d) $\tau = \frac{T}{2}$
9. The equation for length contraction is
 (a) $L = I_0(1 - v^2)$ (b) $L = \frac{I_0}{1 - v^2}$
 (c) $L = I_0 \sqrt{\frac{1 - v^2}{c^2}}$ (d) $\frac{\sqrt{1 - v^2}}{c^2}$
10. Time of flight $T =$
 (a) $\frac{2U \sin \alpha}{g}$ (b) $\frac{U \sin 2\alpha}{g}$
 (c) $\frac{x}{U \cos \alpha}$ (d) $\frac{U \cos \alpha}{2g}$

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Derive the expression for current density.
 Or
 (b) Discuss the conversion of Galvanometer into ammeter.
12. (a) Write the relation connecting M, B, H.
 Or
 (b) Describe the coefficient of coupling.
13. (a) Explain V-I characteristics of Zenerdiode.
 Or
 (b) Explain AND, OR, NOT basic logic gates.
14. (a) Write the general properties of nucleus.
 Or
 (b) State the explain law of radioactive disintegration.

15. (a) Write a note on path of projectile.

Or

- (b) Discuss briefly time dilation.

PART C — ($5 \times 8 = 40$ marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) State and explain Ohm's law.

Or

- (b) State and explain Kirchoff's law.

17. (a) Explain Magnetic permeability and magnetic susceptibility (μ and K).

Or

- (b) Explain determination of mutual induction using BG.

18. (a) Describe the common emitter characteristics of a transistor.

Or

- (b) State and prove Demorgan's theorem.

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19. (a) Explain binding energy curve.

Or

- (b) Explain Soddy Fajan displacement law.

20. (a) Explain range on the horizontal plane.

Or

- (b) Derive Lorentz transformation equation.
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