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PHYSICS Part-II Swat 2025 Time: 20 Minutes Marks: 18 Multiple Choice Questions 01 Mark for each	Paper Code ☒ 1 ☐ 2 ☐ 3	Roll No. of the Student <table border="1"> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>										
Serial No. Of the Answer Book _____												

SECTION-A

Note:

- 1) Attempting all MCQs is compulsory. This paper along with the OMR sheet must be returned to the superintendent after due time.
- 2) Fill the circle ☐ ☐ ☐ ☐ ☐ which one is correct with blue or black ball point in separate OMR Sheet like ☒
- 3) If more than one circle in the OMR sheet is filled then no credit will be given to such answer

- I.i. The electric field intensity due to an infinite sheet of charges is $E =$ _____
- ☐ (A) $\frac{\delta A}{\epsilon_0}$ ☒ (B) $\frac{\delta}{2\epsilon_0}$ ☐ (C) $\frac{\delta}{\epsilon_0}$ ☐ (D) $\frac{2\delta}{\epsilon_0}$
- ii. 1 Volt = _____
- ☒ (A) 1 Joule/ coulomb ☐ (B) 1 coulomb/Joule ☐ (C) Newton/ Coulomb ☐ (D) Coulomb/ Newton
- iii. The reciprocal of resistance of a conductor is called _____
- ☐ (A) Inductance ☐ (B) Resistivity ☒ (C) Conductivity ☐ (D) Conductance
- iv. When a wire is stretched and its radius becomes $r/2$, then its resistance will be _____
- ☐ (A) 0 ☐ (B) $2R$ ☒ (C) $4R$ ☐ (D) $16R$
- v. Magnetic flux will be maximum if the angle between magnetic field strength and vector area is _____
- ☒ (A) 0° ☐ (B) 45° ☐ (C) 60° ☐ (D) 90°
- vi. To measure the voltage, the voltmeter is connected with the circuit in _____
- ☐ (A) Series ☒ (B) Parallel ☐ (C) Perpendicular ☐ (D) Straight line
- vii. What is the co-efficient of mutual inductance, when the magnetic flux changes by 2×10^{-2} Wb, and change in current is 0.01 A?
- ☐ (A) Zero ☐ (B) $\frac{1}{2}$ H ☒ (C) 2H ☐ (D) 3H
- viii. Which of the following quantities remain constant in step up transformer?
- ☐ (A) Current ☐ (B) Voltage ☒ (C) Power ☐ (D) Heat
- ix. The maximum Value attained by an AC wave form is called its _____
- ☐ (A) Average Value ☒ (B) Peak Value ☐ (C) Effective Value ☐ (D) RMS Value
- x. An alternating voltage is given by $20 \sin 157t$, The frequency of alternating voltage is _____
- ☐ (A) 25Hz ☒ (B) 50Hz ☐ (C) 75Hz ☐ (D) 100Hz
- xi. The shear modulus of elasticity G is _____
- ☐ (A) $Al/F\theta$ ☐ (B) $Al/A\theta$ ☒ (C) $F/A\theta$ ☐ (D) Al/F
- xii. The temperature at which material becomes super conductor is called _____
- ☐ (A) Knee temperature ☐ (B) Absolute Temperature ☒ (C) Critical temperature ☐ (D) Curie temperature
- xiii. The conversion of AC into DC is called _____
- ☒ (A) Rectification ☐ (B) Amplification ☐ (C) Magnification ☐ (D) Ionization
- xiv. PN junction when reversed biased act as _____
- ☐ (A) Capacitor ☐ (B) Inductor ☐ (C) ON switch ☒ (D) OFF switch
- xv. The minimum number of anode required for half wave rectification are _____
- ☒ (A) 1 ☐ (B) 2 ☐ (C) 3 ☐ (D) 4
- xvi. Pair production cannot take place in vacuum because _____ is not conserved.
- ☐ (A) Mass ☒ (B) Momentum ☐ (C) Charge ☐ (D) Energy
- xvii. The duration of meta-stable state is approximately _____
- ☐ (A) $10^{-3}s$ ☐ (B) $10^{-6}s$ ☒ (C) $10^{-8}s$ ☐ (D) $10^{-10}s$
- xviii. One curie is equal to _____
- ☐ (A) 3.70×10^{10} Bq ☐ (B) 1×10^9 Bq ☒ (C) 3.70×10^{10} Bq ☐ (D) 1×10^{10} Bq

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PHYSICS Part-II
Swat 2025

Note: Time allowed for section B and C is 2 hours and 40 minutes.

SECTION "B"

Marks: 40

II. Attempt any Ten Parts out of the following. Each Part carries equal marks.

- i. Define the terms: Electric Potential, Potential gradient, Electron Volt, Dipole Moment.
- ii. How can you increase the capacitance of a capacitor?
- iii. State Ohm's Law. Differentiate between Ohmic and Non Ohmic substances?
- iv. Show that $1 \text{ KWh} = 3.6 \times 10^6 \text{ J}$.
- v. Differentiate between permeability and permittivity?
- vi. What factors limit the size of the back emf?
- vii. Show that power loss in a resistor is $P = V_{\text{rms}} I_{\text{rms}}$.
- viii. How does doubling the frequency affect the reactance of an inductor?
- ix. Differentiate between soft and hard magnetic Materials.
- x. For a common Emitter Configuration, show that $\beta = \frac{2}{1-\alpha}$.
- xi. If an electron and a proton have the same de-Broglie wave length, which particle has greater speed and why?
- xii. Find the wave length associated with an electron in the state $n=4$ of hydrogen.
- xiii. What factors make a fusion reaction difficult to achieve?

SECTION "C"

Marks: 27

Note: Attempt any Three questions of the following. Each question carries equal Marks.

- III. (a) Define Capacitor. Show that energy stored in Capacitor $E = \frac{1}{2} \epsilon_0 \epsilon_r E^2$
(b) A 10 watt resistor has a value of 120Ω . Find the rated current through resistor?
- IV. (a) State Ampere's Law. Derive an expression for the magnetic field due to current Carrying solenoid.
(b) Current in a circuit falls from 5A to 0A in 0.1sec. If an average emf of 200v is induced, then find the self-inductance of the circuit?
- V. (a) Differentiate between paramagnetic, Diamagnetic and Ferromagnetic materials with suitable examples
(b) A force of $1.5 \times 10^4 \text{ N}$ causes strain of 1.4×10^{-4} in a steel cable of cross-sectional area $4.8 \times 10^{-4} \text{ m}^2$. Find the Young's Modulus of the steel cable.
- VI. Give a brief Description of any two of the following:
(a) Coulomb's Law
(b) Photo Electric Effect
(c) Nuclear Fusion