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| <b>PHYSICS Part-II</b><br>Time: 20 Minutes<br>Marks: 18<br>Multiple Choice Questions<br>01 Mark for each | Paper Code<br>①<br>②<br>● | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Roll No. of the Student</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> </tr> </table> Serial No. Of the Answer Book _____ | Roll No. of the Student |  |  |  |  |  |
| Roll No. of the Student                                                                                  |                           |                                                                                                                                                                                                                                                                                                                                       |                         |  |  |  |  |  |

### 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 (A)(B)(C)(D), which one is correct with blue or black ball point, in this sheet as well as 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. In transistor, collector current is controlled by \_\_\_\_\_.

- (A) Collector voltage    (B) Base current    (C) Collector resistance    (D) All of these

ii. A perfect absorber must also be perfect \_\_\_\_\_.

- (A) Cavity    (B) Source of radiation    (C) Radiator    (D) None of these

iii. 1 amu is equal to \_\_\_\_\_.

- (A)  $1.66 \times 10^{-27} \text{ kg}$     (B)  $1.66 \times 10^{-27} \text{ J}$     (C)  $3 \times 10^{-7} \text{ J}$     (D) None of these

iv. The rest mass of photon is equal to \_\_\_\_\_.

- (A)  $9.1 \times 10^{-31} \text{ Kg}$     (B)  $6.6 \times 10^{-27} \text{ Kg}$     (C)  $6.6 \times 10^{-31} \text{ Kg}$     (D) Zero

v. Unit of decay constant is \_\_\_\_\_.

- (A) ms    (B)  $\text{m}^{-1}$     (C) m    (D)  $\text{s}^{-1}$

vi. In N-type substances the charge carriers in majority are \_\_\_\_\_.

- (A) Holes(+e)    (B) Electrons    (C) Protons    (D) Positive ions

vii. The circuit in which current & voltage are in phase, the power factor is \_\_\_\_\_.

- (A) Zero    (B) 1    (C) -1    (D) 2

viii. The velocity of electromagnetic waves according to Maxwell's is given by \_\_\_\_\_.

- (A)  $\sqrt{\epsilon_0 \mu_0}$     (B)  $\frac{\epsilon_0}{\mu_0}$     (C)  $\frac{1}{\sqrt{\epsilon_0 \mu_0}}$     (D) None of these

ix. For electromagnetic waves, Maxwell generalized \_\_\_\_\_.

- (A) Gauss's law for magnetism    (B) Gauss's law for electricity    (C) Ampere Law    (D) None of these

x. The energy stored in a charged capacitor is given by \_\_\_\_\_.

- (A)  $\frac{1}{2} Qv$     (B)  $\frac{1}{2} VC$     (C)  $\frac{1}{2} CV$     (D) None of these

xi. In order to convert the galvanometer into ammeter, the shunt resistance is given by \_\_\_\_\_.

- (A)  $I_g R_g / I_g - 1$     (B)  $I_g R_g / I - I_g$     (C)  $I_g - 1 / R_g I$     (D) None of these

xii. Which of the following quantities remain constant in step up transformer \_\_\_\_\_.

- (A) Current    (B) Voltage    (C) Power    (D) Heat

xiii. If the frequency in RC circuit is doubled then its capacitive reactance will be \_\_\_\_\_.

- (A) constant    (B) Double    (C) half    (D) None of these

xiv. Ampere law is applicable to \_\_\_\_\_.

- (A) Circular path    (B) Rectangular path    (C) To any closed path    (D) None of these

xv. One weber is equal to \_\_\_\_\_.

- (A)  $\text{N.A}^2/\text{m}$     (B)  $\text{N.m}^2/\text{A}$     (C)  $\text{N.m}/\text{A}$     (D)  $\text{N.A}/\text{m}$

xvi. A wire of uniform cross section (A) length L & resistance R is cut into two equal parts. The resistivity of each part will \_\_\_\_\_.

- (A) Doubled    (B) Half    (C) Same    (D) one forth

xvii. An electron volt is a unit of \_\_\_\_\_.

- (A) Potential difference    (B) voltage    (C) Electric power    (D) Energy

xviii. Two charges of  $10 \mu\text{C}$  are separated by a distance of 5cm, the force exerted on each other is \_\_\_\_\_.

- (A) 180 N    (B) 18 N    (C) 60 dynes    (D) 30 N

## PHYSCIS Part-II

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. Voltage are always measured between two points? Why
- ii. Define stress, strain & elasticity?
- iii. What is the nature of force between two wires carrying current in the same direction?
- iv. What is the difference between EMF & Potential difference?
- v. State Len's Law?
- vi. Gives formula for the flux linkage in terms of angular orientation?
- vii. What factors limit the size of the back emf ?
- viii. Water has large dielectric constant but it is rarely used in capacitors? Explain
- ix. Can the step-up transformer increase the power level?
- x. Define Paramagnetic & Ferromagnetic materials?
- xi. Define PN junction & explain the formation of depletion region?
- xii. In a RL circuit, will the current lag or lead the voltage? Illustrate your answer by phasor diagram?
- xiii. What are isotopes? Explain with examples.

**SECTION "C"****Marks: 27**

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

- III. (a) State & explain Gauss's law of electrostatics?  
(b) Using Gauss's law to calculate electric field intensity for infinite sheet of charges?
- IV. (a) Define & explain the half life of a radioactive element?  
(b) Calculate the total energy released of 1kg of  $U^{235}$  undergoes fission? Taking the disintegration energy per event to be  $Q=280 \text{ Me}$ .
- V. (a) Explain the phenomenon of self-induction? State the factors which determine the value of self-induction?  
(b) Back emf of a motor is 120 V when turning at 1680rev/min. What is back emf when the motor turning at 3360 rev/min?
- VI. Write a comprehensive note on any two of the following.
  - a) AC Generator
  - b) PN Junction
  - c) Binding Energy & Mass defect