PHYSICS (Fresh) P-II Time: 20 Minutes Marks: 18 Multiple Choice Questions 01 Mark for each	Paper Code ① ● ③	Roll No. of the Student 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 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.

1. In RLC series AC circuit V_L and V_C are _____.

Ⓐ Out of phase by 360° Ⓑ Out of Phase by 90° ● Out of phase by 180° Ⓓ In phase

2. When charge partical enter perpendicular to megnetic field, the path followed by it is _____.

Ⓐ A helix ● A circle Ⓒ Straight line Ⓓ Ellipse

3. During experiment the function of galvano meter is photo electric effect is to _____ current.

Ⓐ controle Ⓑ increase Ⓒ decrease ● detect

4. Mass equivalent of 931 MeV energy is _____.

Ⓐ $6.02\times10^{-23}kg$ ● $1.766\times10^{-27}kg$ Ⓒ $2.67\times10^{-27}kg$ Ⓓ $6.02\times10^{-27}kg$

5. The phase difference between the current and voltage at resinance is _____.

● 0 Ⓑ π Ⓒ $-\pi$ Ⓓ $\pi/2$

6. The SI unit of Electric field intensity is _____.

Ⓐ Coulomb per meter Ⓑ Joul per meter Ⓒ Coulomb per Second ● Volt per meter

7. Inject printer works on the principle of _____.

Ⓐ Gauss's law Ⓑ Ohm's law ● Electrostatics Ⓓ Faraday's law

8. In choke coil the reactance X_L and resistance R are _____.

Ⓐ $X_L = R$ Ⓑ $X_L \ll R$ ● $X_L \gg R$ Ⓓ $X_L = \infty$

9. The positron has charge which is in magnitude equal to the charge on _____.

Ⓐ Electron Ⓑ Proton Ⓒ β-particle ● All

10. Which of the following remains constant in step-up transformer?

Ⓐ Voltage Ⓑ Current ● Power Ⓓ Heat

11. When a wire is stretched and its radius become $r/2$, then its resistance will be _____.

● 16R ✗ 4R Ⓒ 2R Ⓓ 0

12. If both the length and radius of the rod are doubled, then the modulus of elasticity will _____.

Ⓐ increase ● decrease Ⓒ doubled Ⓓ remains the same

13. The Atomic model based on classical as well as plank's quantum theory was developed _____.

Ⓐ Ruther ford Ⓑ Thomson Ⓒ Max-Plank ● Bohr

14. A wire is stretched to double of its length, the strain is: _____.

✗ 2 ● 1 Ⓒ zero Ⓓ 0.5

15. 1 tesla is equal to _____.

● 10^4 Gauss ✗ 10^{-4} Gauss Ⓒ 2×10^{-4} Ⓓ 2×10^4

16. The drift velocity of free electron is of the order of _____.

● $10^{-5}ms^{-1}$ Ⓑ $10^{-4}ms^{-1}$ Ⓒ $10^{-8}ms^{-1}$ Ⓓ $10^{8}ms^{-1}$

17. The depletion region has: _____.

● Neither holes nor electrons Ⓑ Holes only Ⓒ Electrons only Ⓓ Both holes & electrons

18. The energy of electron in the exited state $n=4$ is : _____.

Ⓐ $-13.6\ ev$ Ⓑ $-3.4\ ev$ ● $-0.85\ ev$ Ⓓ $-1.5\ ev$

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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. What is the difference between Volt and Electron Volt (ev) and how they are related with each other?

ii. What is an equipotential line and equipotential surface?

iii. What is steady current? Is it Matter, Energy or Both?

iv. How does a current carrying coil behave like a bar magnet?

v. How electromagnetic brake works? Explain.

vi. Prove that the average power dissipated in resistance R over one complete cycle is $P = V_{rms}\, I_{rms}$

vii. What is the stress-strain curve and define the plastic deformation?

viii. What are the majority charge carrier in NPN and PNP Transistors?

ix. Briefly describe Pair Production?

x. Write the general Mathematical form of Balmer, Lyman, Pashen and Brachett series.

xi. What factors make a fusion reaction difficult to achieve.

xii. Differentiate between inertial frame of reference and non-inertial frame of reference.

xiii. What is thermoelectric e.m.f. and Seebeck Effect?

SECTION "C"

Marks: 27

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

III. (a) State and Explain Coulomb's Law. Do include the case when the charge is placed in dielectrics. 5

(b) A Metallic sphere of diameter 40 cm carries a charge of 600 μ C. Find the Electric field intensity at;

(i) A distance of 1.5 cm from the centre of the sphere and (ii) at the surface of the sphere. 4

IV. (a) What is the galvanometer and how it is converted into Ammeter and Volt meter? 5

(b) A wire carrying 5A current and has length of 10 cm between the poles of a magnet is kept at an angle of 60° to the uniform field of 0.6 T. Find the force acting on the wire? 4

V. (a) State and Explain Nuclear fusion reaction for both the cycles. 5

(b) A particle of mass 5.0 mg moves with speed of 8 ms^{-1}. Calculate de Broglie wavelength. 4

VI. (a) What are the main feature of Photoelectric effects? Discuss the failure of classical physics and success of photon concept in explaining this effect 5

(b) The temperature of human body is 35°C . Then what is "λ_{max}" for which the radiation is emitted. 4