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Physics	Inter Part II, 2020 Lahore Board	Group – I
Time: 20 Min.	Objective Type	Marks: 17

Note:

Four possible answers A, B, C and D to each question are given. The choice which you think is correct fill that circle in front of that question with Marker or Pen ink in the answer book. Cutting or filling two or more circles will result in zero mark in that question.

1. The Davisson and Germer experiment confirmed
Ⓐ Wave nature of particles Ⓑ Polarization
Ⓒ Compton effect Ⓓ Photoelectric effect

2. The frequency of an inductor of 1.0 H have a reactance of 500 Ω is
Ⓐ 70 Hz Ⓑ 80 Hz
Ⓒ 90 Hz Ⓓ 100 Hz

3. Shunt resistance of an ammeter is
Ⓐ $R_s = \frac{I - I_g}{I_g} R_g$ Ⓑ $R_s = (I - I_g) R_g$
Ⓒ $R_s = \frac{I_g}{R_g}$ Ⓓ $R_s = \frac{I_g}{I - I_g} R_g$

4. In a certain circuit, the transistor has a collector current of 10 mA and a base current of 40μA. The current gain of the transistor is:
Ⓐ 250 Ⓑ 300
Ⓒ 350 Ⓓ 450

5. The A.M. transmission frequencies range is from:
Ⓐ 540 μ Hz to 1600 μ Hz Ⓑ 540 KHz to 1600 KHz
Ⓒ 540 MHz to 1600 MHz Ⓓ 540 Hz to 1600 Hz

6. In case of capacitor, formula for energy density is given by:
Ⓐ $\frac{1}{2}\varepsilon_r\varepsilon_0 E^2$ Ⓑ $\frac{1}{2}\varepsilon_r\varepsilon_0 E^2 Ad$
Ⓒ $\frac{1}{2}\varepsilon_r E^2$ Ⓓ $\frac{1}{2}\varepsilon_0 E^2$

7. The dead time of the G.M. counter is:
Ⓐ $\sim 10^{-3}$s Ⓑ $\sim 10^{-6}$s
Ⓒ $\sim 10^{-4}$s Ⓓ $\sim 10^{-5}$s

8. One henry is equal to:
Ⓐ $VS^{-1}A^{-1}$ Ⓑ VSA^{-1}
Ⓒ $VS^{-1}A$ Ⓓ VSA

9. When platinum wire is heated, it appears white at about:
Ⓐ 500°C Ⓑ 900°C
Ⓒ 1100°C Ⓓ 1600°C

10. The statement that the flux through any closed surface is $\frac{1}{\varepsilon_0}$ times the total charge enclosed in it was given b:
Ⓐ Plank Ⓑ Maxwell
Ⓒ Faraday Ⓓ Gauss

11. The curie temperature for iron is about:
Ⓐ 75°C Ⓑ 750°C
Ⓒ 7500°C Ⓓ 75000°C

12. The device which converts heat energy into electrical energy is:
Ⓐ Thermocouple Ⓑ Solar cell
Ⓒ Electric generator Ⓓ Cell

13. An atom can reside in metastable state for:
Ⓐ $\sim 10^{-6}$s Ⓑ $\sim 10^{-5}$s
Ⓒ $\sim 10^{-4}$s Ⓓ $\sim 10^{-3}$s

14. Output resistance of an operational amplifier is:
Ⓐ A few ohms Ⓑ Mili ohms
Ⓒ Mega ohms Ⓓ Micro ohms

15. One twelveth the mass of carbon atom is:
Ⓐ $1\ \mu = 1.6606\times10^{-31}$kg Ⓑ $1\ \mu = 1.6606\times10^{-27}$kg
Ⓒ $1\ \mu = 1.6606\times10^{-15}$kg Ⓓ $1\ \mu = 1.6606\times10^{-9}$kg

16. A device which converts electrical energy into mechanical energy is called:
Ⓐ Transformer Ⓑ D.C. generator
Ⓒ A.C. generator Ⓓ D.C. motor

17. Torque produces in a current carrying coil when it is placed in:
Ⓐ Gravitational field Ⓑ Electric field
Ⓒ Magnetic field Ⓓ Nuclear field

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Physics	Inter Part-II, 2025 Lahore Board	Group – I
Time: 2.40 hrs.	Essay Type	Marks : 68

SECTION – I

Q.2 **Write short answers to any EIGHT (8) questions: 16**

i. How can you identify that which plate of a capacitor is positively charged?

ii. Electric lines of force never cross. Why?

iii. Describe the effect of medium between two charges upon the Coulomb's force.

iv. What was the result of Millikan oil drop experiment?

v. How can a current loop be used to determine the presence of a magnetic field in a given region of space?

vi. How lamp and scale arrangement is used to observe angle of deflection in galvanometer?

vii. What is digital multimeter? What is its advantage?

viii. Why the voltmeter should have a very high resistance?

ix. A particle which produces more ionization is less penetrating. Why?

x. What information is revealed by the length and shape of the tracks of an incident particle in Wilson Cloud Chamber?

xi. Why are thermal reactors called "thermal"? How do they differ from fast reactors?

xii. Define mass defect and binding energy.

Q.3 **Write short answers to any EIGHT (8) questions: 16**

i. How does the motion of electrons in a n-type substance differ from motion of holes in a p-type substance?

ii. How does electron-hole pairs produce current in a photo-voltaic cell?

iii. Explain with the circuit diagram, how a transistor acts as an ON switch?

iv. Why orderliness of domains of a ferromagnetic material is not preserved at high temperature? Explain.

v. How many crystal systems exist based on geometrical arrangement? Draw schematics of any two systems.

vi. What is meant by hysteresis loss? How is it used in construction of a transformer?

vii. How many times per second will an incandescent lamp reach maximum brilliance when connected to a 50 Hz source?

viii. In an RL circuit will the current lag or lead the voltage? Illustrate your answer by a vector diagram.

ix. In an ideal parallel resonant circuit, why source current is zero at resonant frequency?

x. What do you mean by drift velocity? What is the effect on the drift velocity by increasing the potential difference?

xi. State Kirchhoff's first rule. Interpret it as law of conservation of electric charge.

xii. Differentiate between ohmic and non-ohmic devices. Give one example of each.

Q.4 **Write short answers to any SIX (6) questions: 12**

i. How would you position a flat loop of wire in a changing magnetic field so there is no emf induced in the loop?

ii. Can a D.C. motor be turned into a D.C. generator? What changes are required be done?

iii. What is back emf effect in motor?

iv. When does light behave as a wave when does it behave as a particle?

v. What happens to total radiations from black body if its absolute temperature is doubled?

vi. What is general theory of relativity?

vii. State and write formula of Compton effect

viii. Is energy conserved when an atom emits a photon of light?

ix. Define ionization potential and excitation potential.

SECTION – II

Note: **Attempt any THREE questions.**

Q.5(a) Define electric potential difference and absolute electric potential. Also derive the relation between electric field and electric potential gradient such that $\bar{E} = \frac{\Delta V}{\Delta r}$ 5

(b) The resistance of an iron wire at 0°C is $1\times10^{4}\ \Omega$. What is the resistance at 500°C, if the temperature coefficient of resistance of iron is $5.2\times10^{-3}K^{-1}$? 3

Q.6(a) Derive the relation for energy stored in an inductor in terms of magnetic field. 5

(b) A power line 10m high carries a current of 200A. Find the magnetic field of the wire at the ground. 3

Q.7(a) What is rectification? Discuss the phenomenon of semiconductor diode as full wave rectifier. 5

(b) Find the value of current and inductive reactance when A.C voltage of 200 V at 50 Hz is passed through an inductor of 10 H. 3

Q.8(a) Define and explain photoelectric effect. Also explain photoelectric effect on the basis of quantum theory. 5

(b) A 1.25 cm diameter cylinder is subjected to a load of 2500 kg. Calculate the stress on the bar in mega pascals. 3

Q.9(a) Explain experimental arrangement for the production of X-rays. What are characteristic X-rays? Discuss spectrum of X-rays. 5

(b) Calculate the energy (in Mev) released in the reaction $^{2}_{1}H + ^{3}_{1}H \longrightarrow ^{4}_{2}He + ^{1}_{0}n$ Mass of $^{2}_{1}H$, 2.014102u, $^{3}_{1}H$, 3.01605u, $^{1}_{0}n$, 1.008655u and $^{4}_{2}He$, 4.002603u 3