

AAFAQ ACADEMY – KASUR

Paper: Physics

Chapter (12 – 16)
1ST HALF PHYSICS PART – II

Class: F.Sc. Part – II

Name: _____ Roll No: (in words) _____

OBJECTIVE TYPE

Total Marks: 17

Paper Code: _____

Total Time: 20 Minutes

NOTE: Write your **Roll No.** in space provided. Using lead pencil will result in loss of marks.

Q.No.1: You have four choices for each objective type question as A,B,C and D. The choice which you think is correct; fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

Sr. No.	QUESTION	A	B	C	D
1.	The electric intensity due to point charge is	$\frac{1}{4\pi \epsilon_0} \frac{q}{r^2}$	$\frac{1}{4\pi \epsilon_0} \frac{q q_0}{r^2}$	$\frac{1}{4\pi \epsilon_0} \frac{q}{r}$	None of these
2.	Value of Coulomb's constant depends upon	Nature of the medium	System of units	Both (A) and (B)	Only vacuum or free space
3.	$1 \bullet 6 \times 10^{-19} J$ is always equal to	1 farad	1 coulomb	$1 \frac{\text{newton}}{\text{coulomb}}$	1eV
4.	A capacitor is a device which stores	Electric charge	Electric energy	Electric potential	Both (A) and (B)
5.	The sum of currents in various resistors meeting at a point of the circuit	Equals to the total current	Exceed the total current	Less than total current	None of these
6.	Electric bulb does not obey ohm's law because	Temperature changes	Resistance changes	Heat is produced	All of these
7.	The best instrument used for the accurate measurement of EMF of a cell is	Cathode ray oscilloscope	Digital voltmeter	Potential – meter	All of these
8.	If electric current flows from top towards the bottom through a wire then the direction of lines of force would be	Parallel to the wire	Perpendicular to the wire	Clockwise around the wire	Anticlockwise around the wire
9.	A current flowing away from the reader is denoted by the symbol	•	×	±	None of these
10.	The value of the induced e.m.f. is directly proportional to the	Flux	Potential	Force	None of these
11.	The coil placed with the battery in a circuit in the experiment of self induction is called	Inductor	Secondary	Resistance	Primary
12.	If the plane of the generator coil is parallel to the field then e.m.f. induced in coil is	Zero	Infinite	Maximum or one	One or zero
13.	The alternating current varies as a function of	Current	Voltage	Time	Displacement
14.	In a capacitive circuit	Current lags the voltage by $\pi/2$	Current leads the voltage by $\pi/2$	Current and voltage are in phase	Current leads voltage by 270°
15.	Sound waves are converted into electrical signal by using	Antenna	Microphone	Diode	Capacitor
16.	The magnetic field inside a current-carrying long solenoid is:	Non-uniform	Weak	Uniform and steady	Zero
17.	Temperature coefficient of resistivity for insulators is	Negative	Positive	May be negative or positive	None of these

Good Luck
Ch. Khalid Mahmood Ashraf

SUBJECTIVE TYPE

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Name: _____ Roll No: (in words) _____

Total Marks: 83

Time Allowed: 3 Hours 10 Minutes

SECTION – I (SHORT QUESTIONS)

2. Attempt any EIGHT questions. (8×2=16)Marks

- i. How you can identify that which plate of a capacitor is positively charged?
- ii. Show that $1eV = 1.6 \times 10^{-19} J$.
- iii. If electric potential is constant in a given region of space. Is electrical field zero or non – zero in this region? Explain.
- iv. If a point charge “q” of mass “m” is released in a non-uniform electric field, will it make a rectilinear motion?
- v. Describe units of capacitance.
- vi. Describe the force or forces on a positive point charge when placed between parallel plates? (a) With similar and equal charges. (b) With opposite and equal charges.
- vii. Is \vec{E} necessarily zero inside a rubber balloon if balloon is spherical? Assume that charge is distributed uniformly over the surface.
- viii. Why the resistances of the conductor rise with temperature?
- ix. Do bends in a wire affect its electrical resistance?
- x. What are the difficulties in testing whether the filament of lighted bulb obeys Ohm’s law?
- xi. Describe a circuit which will give a continuously varying potential.
- xii. Explain why the terminal potential difference of a battery decreases when current drawn from it is increased?

3. Attempt any EIGHT questions. (8×2=16)Marks

- i. A square loop of wire is moving through a uniform magnetic field. The normal to the loop is oriented parallel to the magnetic field. Is an emf induced in the loop? Give a reason for your answer.
- ii. What is induced emf? By what factors induced current can be increased?
- iii. Define units of mutual inductance?
- iv. Is induced emf always decreases the magnetic flux, explain?
- v. If a flat loop is located in XY – plane in a magnetic field directed parallel to the Y – axis, in which direction does the loop rotated so that emf induced in it?
- vi. Can a D.C. motor be turned into a D.C. generator? What changes are required to be done?
- vii. (a) Can a step – up transformer increases the power level? (b) In a transformer, there is no transfer of charge from the primary to the secondary. How, is then power transferred?
- viii. Show that ε and $\frac{\Delta\phi}{\Delta t}$ have the same units.
- ix. When an electric motor such as an electric drill, is being used, does it also act as a generator? If so what is the consequence of this?
- x. Four unmarked wires emerge from a transformer. What steps would you take to determine the turns ratio?
- xi. How we increase the efficiency of a transformer, explain?
- xii. Is it possible to change both the area of the loop and the magnetic field passing through the loop and still not have an induced emf in the loop?

4. Attempt any SIX questions. (6×2=12)Marks

- i. A circuit contains an iron – core inductor, a switch and a D.C. source arranged in series. The switch is closed and reopened. Explain why a spark jumps across the switch contacts?
- ii. Describe phase of A.C.
- iii. Name the device (a) that will permit flow of direct current but opposes flow of alternating current (b) permit flow of alternating current but cannot direct current.
- iv. How reactance affected by doubling the frequency of (a) an inductor (b) a capacitor?
- v. Explain the conditions under which electromagnetic waves are produced from a source?
- vi. What is the principle of metal detector?
- vii. How transmission of a particular radio station picked up on your radio set, explain?
- viii. Describe the resonance condition in electrical circuits.
- ix. Give advantages and disadvantages of FM over AM.

SECTION – II (ESSAY TYPE) Attempt THREE questions

5. Do as directed...

- i. What is capacitor? Find the capacitance of a parallel plate capacitor and explain the result. (5)
- ii. Find the equivalent resistance of the circuit, total current drawn from the source and the current through each resistor. (3)

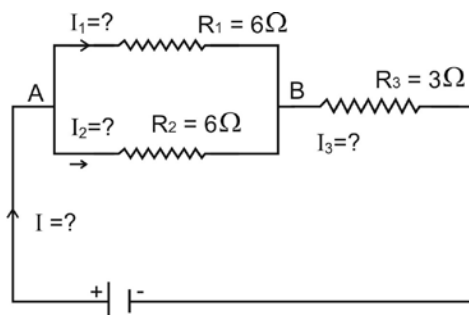
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- 6. Do as directed...**
- i. What is emf? Find the relation between electromotive force and terminal potential difference. (5)
 - ii. In Bohr's atomic model of hydrogen atom, the electron is in an orbit around the nuclear proton at a distance of $5 \cdot 29 \times 10^{-11} m$ with a speed of $2 \cdot 18 \times 10^6 m \cdot s^{-1}$. (a) The electric potential that a proton exert at this distance. (b) Total energy of the atom in eV . (c) The ionization energy of the atom in eV . (3)
- 7. Do as directed...**
- i. What is CRO? Describe its function and uses in detail. (5)
 - ii. A circular coil has $15 \cdot 0$ turns of radius $2 \cdot 0$ cm each. The plane of the coil is inclined at 40° to a uniform magnetic field of $0 \cdot 2$ T. If the field is increased to $0 \cdot 5$ T in $0 \cdot 2$ s, find the magnitude of the induced EMF. (3)
- 8. Do as directed...**
- i. What is an A.C. generator? Give its construction and find the relation for alternating current. (5)
 - ii. You are asked to design a solenoid that will give a magnetic field of $0 \cdot 10$ T, yet the current must not exceed $10 \cdot 0$ A. Find the number of turns per unit length that the solenoid should have? (3)
- 9. Do as directed...**
- i. How we transmit and receive electromagnetic waves? Describe in detail. (5)
 - ii. A $10 \cdot 0$ mH, $20 \cdot 0$ Ω coil is connected across 240 V and $\frac{180}{\pi}$ Hz source. How much power does it dissipate? (3)

SECTION – III (Practical)

- 10. (a) Write answer of FOUR questions. (4 × 2 = 8)**
- i. On which principle slide wire bridge works?
 - ii. What is the effect of temperature on resistance of the conductor?
 - iii. Why galvanometer shows half deflection when both keys are closed in half deflection method?
 - iv. Define units of electric potential.
 - v. Why potentiometer is an accurate device for the measurement of potential difference?
 - vi. What is the principle of potentiometer?
 - vii. What is difference between emf and terminal potential difference?
 - viii. How we find current for full scale deflection in galvanometer?
- 10. (b) Write procedure to determine the resistance of voltmeter by graph method. (3)**
- (OR)**
- Write procedure to find the emf of unknown cell by using potentiometer. (3)
- 10. (c) Answer the following questions on the basis of graph drawn between $(R \times S)$ and $(R - S)$. (4)**
- i. Write the inference from the graph.
 - ii. What does the slope of the graph represents?

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(OR)

Answer the following questions on the basis of graph drawn between (R) and ($\frac{1}{V}$). (4)

- i. What you conclude from the graph?
- ii. What does the X – intercept of graph inform?

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