



CHAPTER TEST

STD: XII

PHYSICS –CURRENTELCTRICITY

TIME: 1 HR 15 MINS

MARKS: 35

Answer all the questions. Section *A* carries 1 mark, Section *B* carries 2 marks, Section *C* carries 3 marks, Section *D* carries 5 marks, Section *E* carries 4 marks.

SECTION – A

- If a wire is stretched to make it 0.1% longer. Its resistance will:
(a) Decrease by 0.05% (b) increased by 0.05%
(c) Increased by 0.2 % (d) decreased by 0.2%
- A wire resistance R is cut into ten equal parts which are then joined in parallel. The new resistance is:
(a) $0.01 R$ (b) $0.1 R$ (c) $10R$ (d) $50 R$
- A cell of emf E and internal resistance r is connected to an external resistance r . The PD across the terminals of the cell is:
(a) E (b) $2E$ (c) $E/2$ (d) $E/4$
- The resistance of a wire is 5Ω at 50°C and 6Ω at 0°C will be:
(a) 1Ω (b) 4Ω (c) 3Ω (d) 2Ω
- Assertion (A): In balanced condition of Wheatstone's bridge, there is no current flow through the galvanometer.
Reason (R): The potential of the point across the galvanometer are same.
a) Both *A* and *R* are true and *R* is the correct explanation of *A*.
b) Both *A* and *R* are true and *R* is not the correct explanation of *A*.
c) *A* is true but *R* is false.
d) *A* is false but *R* is true.
- Assertion (A): Power rating of an appliance is not so important when used in a circuit.
Reason (R): The resistance of the appliance does not change when it is connected to voltage other than its operating voltage.
a) Both *A* and *R* are true and *R* is the correct explanation of *A*.
b) Both *A* and *R* are true and *R* is not the correct explanation of *A*.
c) *A* is true but *R* is false.
d) *A* is false but *R* is true.

SECTION – B

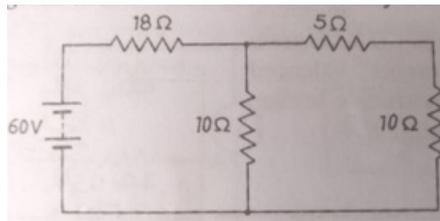
- A wire of resistance R is stretched until its radius is halved. What is its new resistance?
- State Ohm's law. Draw a $V-I$ graph for an ohmic conductor.
- Six lead accumulators, each of emf $2.0 V$ and internal resistance 0.015Ω are joined in series to supply current to an external resistance of 8.5Ω . Find the current terminal drawn from the supply and its terminal voltage.



10. When the external resistance R connected in series with a cell is exactly halved, the current is not exactly double, why?

SECTION – C

11. Obtain the expression showing the relation between the current density j in the current-carrying conductor, the drift velocity vd , the number of free electrons per unit volume n and the electronic charge e .
12. Calculate the voltage drop across the $18\ \Omega$ resistor in given circuit. The *emf* of the battery is $60\ V$. When the battery of *emf* E and internal resistance r is connected to a resistance R , a current i flow through it. Derive a relationship among E, i, r and R .



13. n Identical cells, each of *emf* E and internal resistance r is connected to a resistance R . Deduce an expression for the internal resistance r of one cell in terms of the current i in the circuit.

14. Define the term: i) Current density ii) Drift velocity iii) Current

SECTION – D

15. State the Kirchhoff's law. Obtain the balancing condition for whetstone's bridge

SECTION – E

16. Case Study Based Questions:

Power is the amount of work done by the electrical appliance in the given time. Each electrical appliance is rated with their power consumption. Natalie needs to buy a fan, 4 LED, an electrical toaster, microwave oven, an AC and a refrigerator. The power rating of the devices she bought are as listed:

Electrical Appliance	Power rating
FAN	100 W, 220 V
LED	40 W, 220 V
ELECTRICAL TOASTER	1000 W, 220 V
MICROWAVE OVEN	2200 W, 220 V
AC	1500 W, 220 V
REFRIGERATOR	480 W, 220 V

- i) How much energy is consumed in 10 days by four LED's if it's operated for 8 hours per day?
- ii) Is AC is safer to connect in 5 A, 220 V fuse rating? Give reason for your answer.
- iii) Calculate the energy consumed by Fan and Refrigerator for the month of August 2022.