

**Model Question Paper**  
**Current Electricity - Part IV**

12th Standard

**Physics**

Reg.No. : 

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I. Answer all the Questions.

II. Use blue pen only.

Time : 01:15:00 Hrs

Total Marks : 63

5 x 1 = 5

**Section-A**

- 1) The magnets used to levitate the trains from the rails  
(a) permanent electromagnets (b) strong magnetic substances (c) a magnetic field with varying frequency (d) super conducting magnets
- 2) The special features of carbon resistor  
(a) small in size (b) stable (c) cheaper (d) all these
- 3) The silver ring in a carbon resistor denotes the tolerance range  
(a) 10% (b) 20% (c) 5% (d) 2%
- 4) If there is no coloured ring on the other end of a carbon resistor, then the tolerance's  
(a) 20% (b) 10% (c) 2% (d) 1%
- 5) The effective resistance of resistors connected in series  
(a) reciprocal of the sum of individual resistors (b) sum of the reciprocal of individual resistors (c) sum of the individual resistors  
(d) reciprocal of the sum of the square of individual

**Section-B**

6 x 3 = 18

- 6) The resistance of a platinum wire at  $0^{\circ}\text{C}$  is  $4\ \Omega$ . What will be the resistance of the wire at  $100^{\circ}\text{C}$  if the temperature coefficient of resistance of platinum is  $0.0038/^{\circ}\text{C}$ .
- 7) In a metre bridge, the balancing length for a  $10\ \Omega$  resistance in left gap is 51.8 cm. Find the unknown resistance and specific resistance of a wire of length 108 cm and radius 0.2 mm.
- 8) a 1.5V carbon-zinc dry cell is connected across a load of  $1000\ \Omega$ . Calculate the current and power supplied to it.
- 9) Three identical cells, each of emf 2V and internal resistance  $0.2\ \Omega$  are connected in series to an external resistor of  $7.4\ \Omega$ . Calculate the current in the circuit.
- 10) A voltage of 30V is applied across a colour coded carbon resistor with first, second and third rings of blue, black and yellow colours. What is the current flowing through the resistor?
- 11) The resistance of a field coil measure at  $50\ \Omega$  at  $20^{\circ}\text{C}$  and  $65\ \Omega$  at  $70^{\circ}\text{C}$ . Find the temperature coefficient of resistance.

**Section-C**

2 x 5 = 10

- 12) Derive an expression for the effective resistance of resistors in parallel network with a neat diagram.
- 13) What are the applications of superconductors?

**Section - D**

3 x 10 = 30

- 14) Explain the principle of a potentiometer. How can the emf of two cells be compared using potentiometer?
- 15) Explain Wheatstone's bridge and obtain the condition for bridge balance.
- 16) a) Explain the construction and working of Leclanche with a neat sketch.  
b) Explain the construction and working of Lead acid accumulator with a neat diagram.

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