MONTHLY TEST - JUNE, 2024

Standard XII

PHYSICS

Time : 1.30 hrs. Marks : 35

PART - A

I. Choose and write the correct answer: 10x1=10

1. Two metallic spheres of radii 1 cm and 3 cm are given charges of -1×10^{-2} C and 5×10^{-2} C respectively. If these are connected by a conducting wire, the final charge on the bigger sphere is

   a) 3×10^{-2} C b) 4×10^{-2} C

   c) 1×10^{-2} C d) 2×10^{-2} C

2. If the length of conductor is halved, then its conductivity would be

   a) quadrupled b) halved c) doubled d) unchanged

3. An electric field $\vec{E} = 10x\hat{i}$ exists in a certain region of space. Then the potential difference $V = V_0 - V_A$, where V_0 is the potential at the origin and V_A is the potential at $x = 2$ m is

   a) 10 V b) –20 V c) +20 V d) –10 V

4. A capacitor of capacitance 10 μF is fully charged by a 200 V supply. The energy stored in the capacitor is

   a) 10^3 J b) 100 J c) 10^{-4} J d) 0.2 J

5. In Joule's heating law when R and t are constant, if the H is taken along the Y axis and I^2 along the x axis, the graph is

   a) straight line b) parabola c) circle d) ellipse

6. The direction of dipole moment vector is .....

   a) from zero to infinity b) from infinity to zero

   c) from negative charge to positive charge

   d) from positive charge to negative charge

7. A toaster operating at 240 V has a resistance of 120 Ω. Its power is
   a) 400 W b) 2 W c) 480 W d) 240 W
8. If chrage of 60 C passes through a bulb for 4 minutes then the current flows through it is
   a) 1 A b) 0.5 A c) 0.25 A d) 0.75 A
9. When n resistor of equal resistors are connected in series, the effective resistance is
   a) $\frac{R}{n}$ b) nR
   c) $\frac{1}{nR}$ d) $\frac{n}{R}$
10. The temperature about which the resistance of mercury becomes zero is?
    a) 0°C b) –4.2 K
    c) 0 K d) 4.2 K

PART-B

II. Answer any three questions. Qn. No.15 is compulsory question: 3x2=6

11. Define electric field.
12. State Gauss law.
13. What is seebeck effect?
14. Distinguish between Drift velocity and Mobility.
15. A parallel-plate capacitor has plate area 25 cm^2 and a separation of 2 mm between the plates. The capacitor is connected to a battery of 12 V. Calculate the charge on the capacitor.

PART-C

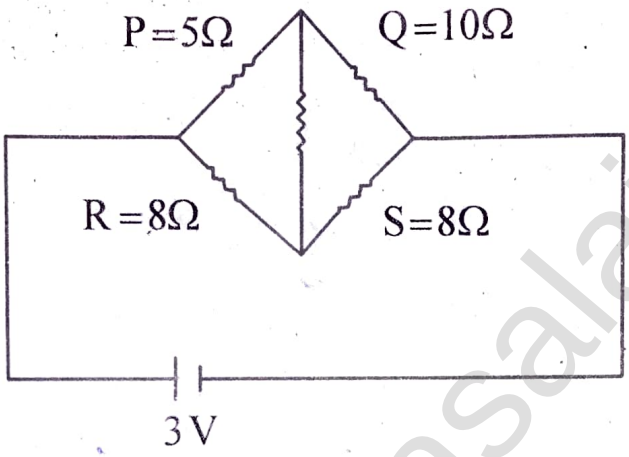
III. Answer any three questions. Qn. No.20 is compulsory question: 3x3=9

16. What is corona discharge?
17. Define capacitance. Give its unit.

18. Why is potentiometer preferred over a voltmeter for comparison of emf of cells?

19. State and explain Kirchhoff's rules.

20. Determine the additional resistance that has to be connected with resistor with resistor of 32 Ω in the following Wheatstone's bridge circuit in order to balance Wheatstone's bridge.



PART -D

IV. Answer all the questions: 2x5=10

21. a) Obtain the condition for bridge balance in Wheastone's bridge.

(OR)

b) Calculate the electric field due to a dipole on its axial line.

22. a) Obtain the expression for electric field due to an infinitely long charged wire.

(OR)

b) Explain the equivalent resistance of a series and parallel resistor network.

*****