MONTHLY TEST - 1

STD: XII   MARKS: 50
SUB: PHYSICS   TIME   : 1 hr 30 mins

Part – I

Choose the correct answer:-   10 x 1 = 10

1. Two points A and B are maintained at potential of 7V and –4V respectively. The work done in moving 50 electrons from A to B
   a) 8.80×10^{-17} J   b) -8.80×10^{-17} J   c) 4.40×10^{-17} J   d) 5.80×10^{-17} J

2. Two identical conducting balls having positive charges q_1 and q_2 are separated by a center to center distance r. If they are made to touch each other and then separated to the same distance, the force between them will be
   a) less than before   b) same as before   c) more than before   d) zero

3. An electric dipole is placed at an alignment angle of 30^0 with an electric field of 2×105 Nc^{-1}. If experiences a torque equal to 8Nm. The charge on the dipole if the dipole length is 1cm is
   a) 4 mC   b) 8mC   c) 5mC   d) 7mC

4. Which charge configuration produces a uniform electric field?
   a) point charge   b) infinite uniform line charge
   c) uniformly charged infinite plane
   d) uniformly charged spherical shell

5. Three capacitors are connected in triangle as shown in the fig. The equivalent capacitance between the points A and C is
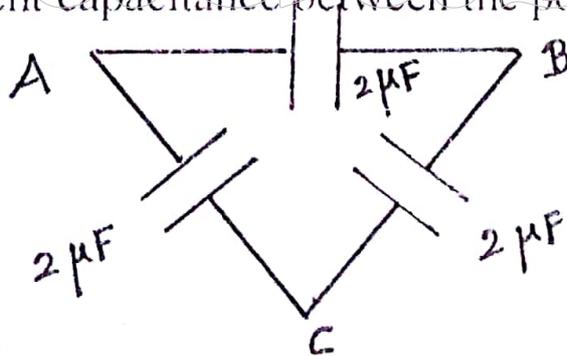

   a) 1µF   b) 2µF   c) 3µF   d) $\frac{1}{4}$ µ F

6. A toaster operating at 240V has a resistance of 120Ω. The power is
   a) 400W   b) 2W   c) 480W   d) 240W

7. In Joule's heating law, when I 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

8. The internal resistance of a 2.1V cell which gives a current of 0.2A through a resistance of 10Ω is
   a) $0.2\ \Omega$ b) $0.5\ \Omega$ c) $0.8\ \Omega$ d) $1.0\ \Omega$
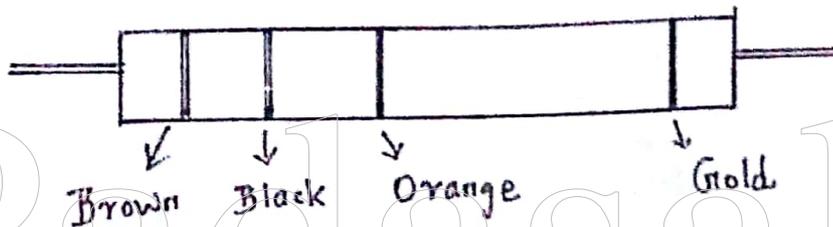
9. What is the current out of the battery?
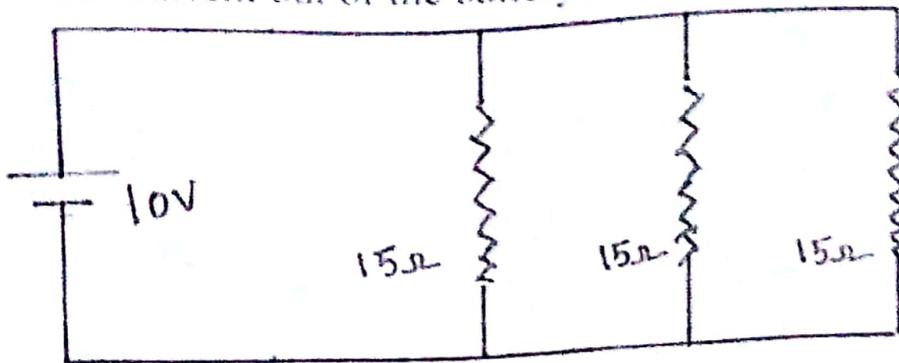
   a) 1A   b) 2A   c) 3A   d) 4A

10. What is the value of resistance of the following resistor?
    a) $100k\ \Omega$ b) $10k\ \Omega$ c) $1k\ \Omega$ d) $1000k\ \Omega$

Brown   Black   Orange   Gold

Part – II

Answer any four questions (Q.No.17 Compulsory):- $4 \times 2 = 8$

11. Define capacitance. Give its unit.
12. Define electric dipole.
13. Define electric flux.
14. The electric field lines never intersect. Justify.
15. State Kirchhoff's current rule.
16. What do you mean by internal resistance of a cell?
17. If the resistance of coil is $3\ \Omega$ at 20^0C and $\alpha=0.004/^0C$ then determine its resistance at 100^0C.
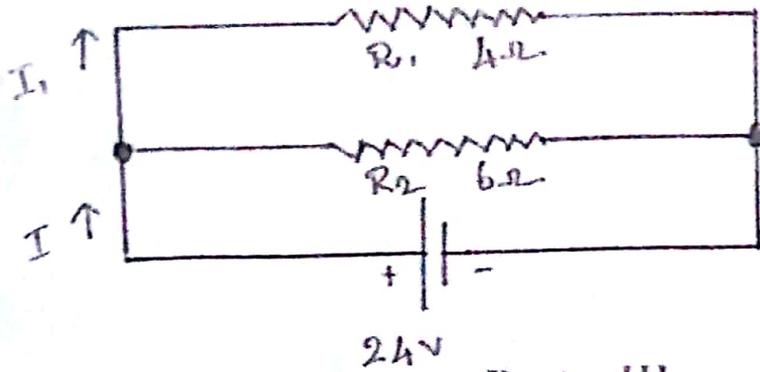
Part – III

Answer any four questions (Q.No.24 Compulsory):- $4 \times 3 = 12$

18. Derive the expression for resultant capacitance, when capacitors are connected in series.
19. Obtain the expression for capacitance for a parallel plate capacitor.
20. Derive an expression for electrostatic potential due to a point charge.
21. Discuss the basic properties of electric charges.

22. How the emf of two cells are compared using potentiometer?

23. Explain the equivalent resistance of a parallel resistor network.

24. Calculate the equivalent resistance in the following circuit and also Find the current I, I_1 and I_2 in the given circuit.

Part – III

4 x 5 = 20

Answer all the questions:-

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

(or)

b) Describe the microscopic model of current and obtain general form of Ohm's law.

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

(or)

b) Explain the determination of the internal resistance of a cell using voltmeter.

27. a) Explain in detail the construction and working of a Van de Graff Generator.

(or)

b) Obtain the condition for bridge balance in Wheatstone's bridge.

28. a) Derive an expression for electrostatic potential due to an electric dipole.

(or)

b) Explain the determination of unknown resistance using meter bridge.

-----ALL THE BEST-----

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