SIR CV RAMAN COACHING CENTRE IDAPPADI,SALEM

XII –PHYSICS   FIRST MID TERM MODEL EXAMINATION   TOTAL MARK : 35 M

DATE :19 .05.2024

Part – A (5 x 1 = 5m)

Choose the correct best answer

1.Two identical conducting balls having positive charges q1 and q2 are separated by a centre to centre 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

2. A parallel plate capacitor stores a charge Q at a voltage V. Suppose the area of the parallel plate capacitor and the distance between the plates are each doubled then which is the quantity that will change?

 (a) Capacitance   (b) Charge   (c) Voltage   (d) Energy density

3. A piece of copper and another of germanium are cooled from room temperature to 80 K. The resistance of

a) each of them increases   b) each of them decreases

c) copper increases and germanium decreases

 d) copper decreases and germanium increases

4. ……………….. Is a very large unit Of capacitance

a) farad   b) micro farad   c) nano farad   d) pico farad

5. Compute the current in the wire if a charge of 120 C is flowing through a copper wire in 2 minute.

 a) 1 A   b) 2 A   c) 0.5 A   d)   0.25 A

PART –B (3 x 2 = 6m)

Answer any THREE Questions .Q.NO 10.COMPULSORY

6. State coulomb's law

7. Define electric dipole

8. When two objects are rubbed with each other, approximately a charge of 50 nC can be produced in each object. Calculate the number of electrons that must be transferred to produce this charge

9. Derive the expression for power P=VI in electrical circuit

10. The resistance of a nichrome wire at 20 degree celsius is 10 Ω. If its temperature coefficient of resistivity of nichrom is 0.004/per degree celsius , find the resistance of the wire at boiling point of water. Comment on the result.

PART -B(3 x 3 = 9m)

Answer any THREE Questions Q.NO 15.COMPULSORY

11.Derive an expression for electrostatic potential due to a point charge.

12.Obtain the expression for electric field due to an charged infinite plane sheet.

13. State the principle of potentiometer

14.Two resistors when connected in series and parallel, their equivalent resistances are 15 Ω and 56/15Ω respectively. Find the values of the resistances

15.Calculate the electric flux through the rectangle of sides 5 cm and 10 cm kept in the region of a uniform electric field 100 NC^{-1}. The angle θ is 60^0. If θ becomes zero, what is the electric flux?

PART –C (3 x 5 = 15m)

Answer any THREE Questions

16. a) Calculate the electric field due to a dipole on its equatorial plane

(OR)

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

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

(OR)

b) They are separated by a distance of 1m. Calculate the force experienced by the two charges for the following cases: (a) q_1 = +2 μC and q_2 = +3 μC (b) q_1 = +2 μC and q_2 = –3 μC

18 a) Obtain the expression for energy stored in the parallel plate capacitor.

(OR)

b) (i) Define electrical resistivity (ii) The resistance of a wire is 20 Ω. What will be new resistance, if it is stretched uniformly 8 times its original length?

PREPARED BY

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''ALL THE BEST''