V.V.MATRIC. HIGHER   SECONDARY. SCHOOL- PAPPIREDDIPATTI

(PHYSICS UNIT TEST-1)

CLASS:12.   MARKS:70

DATE:5.11.2022.   TIME: 3 HRS

Part-I

Answer the following questions.   15×1=15

1.An electric dipole is placed at an alignment angle of 90° with an electric field of 2×10^5 N C^{-1}. It experiences a torque equal to 8 N m. The charge on the dipole if the dipole length is 1 cm is

   (a) 4 mC.   (b) 8 mC.   (c) 5 mC.   (d) 7 mC

2.Two points A and B are maintained at a potential of 7 V and -4 V respectively. The work done in moving 50 electrons from A to B is

   (a) 8.80×10^{-17} J.   (b) -8.80×10^{-17} J.   (c) 4.40×10^{-17} J.   (d) 5.80×10^{-17} J

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

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

4.If the dielectric inserted b/n the plates of an air capacitor the capacitance will.......

      (a) decrease.   (b) increase.   (c) unchanged.   (d). Zero

5.The electric field at a point is placed inside the uniformly charged spherical shell is......

    (a) $E=q/4\pi$.   (b)E=0.   (c).   (d)

6. 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

7.What is the resultant resistance? for the following circuit

a) 1/15 ohm   b) 1/3 ohm   c) 1ohm   d) 1/9 ohm

8.The temperature coefficient of resistance of a wire is 0.00125 per °C. At 20°C, its resistance is 1 Ω. The resistance of the wire will be 2 Ω at

    a) 800 °C.   b) 700 °C.   c) 850 °C   d) 820 °C

9.An ideal battery has .... Internal resistance

 (a) Maximum　　　(b)minimum.　　　(c)Zero.　　　(d) Unchanged

10.A semiconductor with a negative temperature coefficient of resistivity is called a.. ....

 (a)Resistor　　　(b) thermistor.　　　(c) capacitor.　　　(d) diode

11.The vertical component of Earth's magnetic field at a place is equal to the horizontal component. What is the value of angle of dip at this place?

 (a) 30°　　　　　(b) 45°　　　　　(c) 60°.　　　　　(d) 90°

12.A circular coil of radius 5 cm and 50 turns carries a current of 3 ampere. The magnetic dipole moment of the coil is nearly

 (a) 1.0 A m2.　　　(b) 1.2 A m2.　　　(c) 0.5 A m2.　　　(d) 0.8 A m2

13.Relative permeability of iron is 5500 ,then its magnetic suceptibility will be,..................

 (a)5300.　　　　　(b)4999.　　　　　(c)5501.　　　　　(d)5499

14.The potential energy of magnetic dipole whose dipole moment is p m= (−05i+ 04j)Am2 kept in uniform magnetic field B = 0 2.iT

 (a) −0.1 J.　　　(b) −0.8 J　　　(c) 0.1 J.　　　　(d) 0.8 J

15.If a magnet is cut into two equal halves along the length then pole strength is ....

 (a)remains same.　　　(b)reduced half.　　　(c) reduced. Maximum　　　(d) zero

<center>Part-II</center>

Answer any 6 question (Q.no:24 is compulsory).　　　　6x2=12

16.Give the relation between electric field and electric potential.

17.What is corona discharge?

18.State Kirchhoff 's rules.

19. What is Peltier effect?

20.Determine the number of electrons flowing per second through a conductor, when a current of 32 A flows through it.

21.state Meissner effect.

22.State Biot-Savart's law.

23.State Fleming's left hand rule.

24.Consider a point charge +q placed at the origin and another point charge -2qplaced at a distance of 9 m from the charge +q. Determine the point between the two charges at which electric potential is zero.

Part-III

Answer any 6 question (Q.no:29 is compulsory).   6×3=18

25.Obtain the expression for electric field due to an infinitely long charged wire.

26.Obtain the expression for energy stored in the parallel plate capacitor.

27.Derive the expression for resultant capacitance, when capacitors are connected in parallel.

28.Eplain the determination of unknown resistance using meter bridge.

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

30.a)State Joule's law of heating   b)Define temperature coefficient of resistance.

31.Discuss the conversion of galvanometer into an ammeter .

32.Give an account of magnetic Lorentz force.

33.Calculate the magnetic field at a point on the axial line of a bar magnet.

Part-IV

Answer all question   5×5=25

34.Derive an expression for electrostatic potential due to an electric dipole(or)

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

35.Obtain the condition for bridge balance in Wheatstone's bridge.(or)

Calculate the magnetic field inside and outside of the long solenoid using Ampere's circuital law.

36.Deduce the relation for the magnetic field at a point due to an infinitely long straight conductor carrying current using Biot-Savart law (or)

  A parallel plate capacitor filled with mica having εr = 5 is connected to a 10 V battery. The area of each parallel plate is 6 cm2 and separation distance is 6 mm. (a) Find the capacitance and stored charge. (b) After the capacitor is fully charged, the battery is disconnected and the dielectric is removed carefully. Calculate the new values of capacitance, stored energy and charge.

37.Explain in detail the construction and working of a Van de Graaff generator (or)

Obtain a relation for the magnetic field at a point along the axis of a circular coil carrying current using Biot-Savart law.

38.Explain the determination of the internal resistance of a cell using voltmeter.(or)

 a).Obtain the expression for capacitance for a parallel plate capacitor.

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

"" (ALL POWER IS WITH IN YOU; YOU CAN DO ANYTHING AND EVERY THING)""