Practice Sheet [Unit 1 & 2]
[Electrostatics & Current Electricity]

Q1. Two infinetly long parallel conducting plates having surface charge densities +σ and -σ respt,are separated by a small distance.The medium b/w the plates is vacume.If ε_o is the di electric permittivity of vacuum, then the electric field in the region b/w plates is

(a)0 volt/m (b) $\frac{\sigma}{2\varepsilon_o} volt/m$

(c) $\frac{\sigma}{\varepsilon_o} volt/m$ (d) $\frac{2\sigma}{\varepsilon_o} volt/m$

Q2. Twoparallel plates having equaland opposite charges when space b/w them is evacuated the electric field b/w the plates 2×10^{-5} V/m .When the space is filled with dielectric the electric field becomes 1×10^{5} V/m.The dielectric constant of dielectric material is

(a)1/2 (b)1 (c)2 (d)3

Q3. The voltage cloud is 4×10^{6} V with respect to ground. In a lightning strike lasting 100 ms, a charge of 4C is delivered to ground .The power of lightning strike is

(a)160 Mw (b)80Mw (c)20Mw (d)500Kw

Q4. Three charges 1 μC,1 μC and 2 μC are kept at vertices A,B and C of an equilateral triangle ABC of10 cm side respt.The resultant force on charge at C is

(a)0.9 N (b)3.12N (c)2.72N (d)3.6N

Q5. The electrostatic potential inside a charged spherical ball is given by $\phi = ar^2 + b$,where r is the distance from the centre a,b are constant .Then charge density inside ball is

(a)-6a ε_o r (b)-24πa ε_o (c)-6a ε_o (d)-24πa ε_o r

Q6.A thin spherical conducting shell of radius R has charge q. Another charge Q is placed at the centre of the shell .The electrostatic potential at a point P at distance R/2 from the centre of the shell is

(a) $\frac{2Q}{4\pi\varepsilon_o R}$ (b) $\frac{2Q}{4\pi\varepsilon_o R} - \frac{2q}{4\pi\varepsilon_o R}$

(c) $\frac{2Q}{4\pi\varepsilon_o R} + \frac{q}{4\pi\varepsilon_o R}$ (d) $\frac{(Q+q)}{4\pi\varepsilon_o}\frac{2}{R}$

Q7. Twothin wire rings each having a radius R are placed at a distance "d" apart with their axes coinciding.The charges on the two rings are +q and –q.The potential difference b/w the centres of the two ring is

(a) $\frac{qR}{4\pi\varepsilon_o d^2}$ (b) $\frac{q}{2\pi\varepsilon_o}\left[\frac{1}{R} - \frac{1}{\sqrt{R^2+d^2}}\right]$ (c)Zero

(d) $\frac{q}{4\pi\varepsilon_o}\left[\frac{1}{R} - \frac{1}{\sqrt{R^2+d^2}}\right]$

Q8. An electric charge 10-3μC is placed at the origin (0.0) of X-Y co-ordinate system..Two points Aand B are situated at $(\sqrt{2},\sqrt{2})$ and (2,0) respt.The potential difference b/w the points A and B will be

(a)9V (b)zero (c)2V (d)4.5V

Q9. Two points P and Q are maintained at the potentials of 10V and -4V respt.The work done in moving 100 electron from P to Q is

(a)-19×10^{-17}J (b)9.60×10^{-17}J (c)-2.24×10^{-16}J (d)2.24×10^{-16}J

Q10. An electric dipole is placed at angle of 30o to a non uniform electric field.The dipole will experience

(a)a translational force only in the direction of the field

(b)a translational force only in direction normal to the direction of the field.

(c)a torque as well as a translational force

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Q11. Two point charges +8q and -2q are located at x=0 and x=L respectively.The location of a point on the x-axis at which the net electric field due to these two point charges is zero

(a)2L (b)L/4 (c)8L (d)4L

Q12. Two spherical conductors A and B of radii 1 mm and 2mm are separated by distance 5cm and are uniformely charged.If the sphere are connected by a conducting wire then in equilibrium condition,the ratio of the magnitude of the electric field at the surfaces of sphere A and B is

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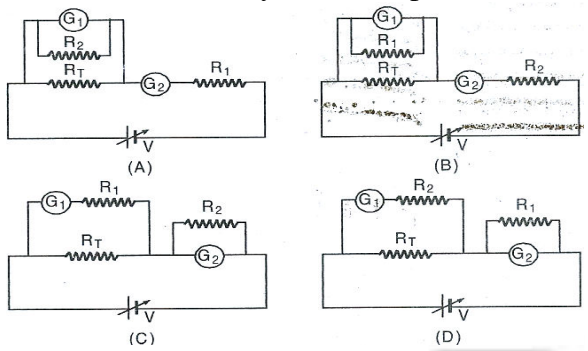
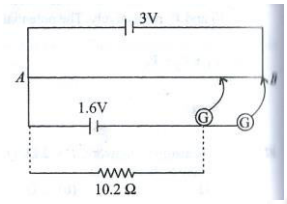
Q13. To verify Ohm's law , a student is provided with a test resistor R_1 a high resistance R_{11} a small resistance R_2, two identical galvanometers G_1 and G_2 and a variable voltage source V. The correct circuit to carry out the experiment is

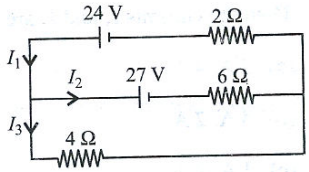


Q14.3V potentiometer used for the determination of internal resistance of a 2.4V cell.The balance point of the cell in open circuit is 75.8 cm.When a resistor of 10.2 Ω is used in the external circuit of the cell the balance point shifts to 68.3 cm length of the potentiometer wire. The internal resistance of the cell is



(a) 2.5Ω (b)2.25Ω (c)1.12Ω (d)3.2Ω

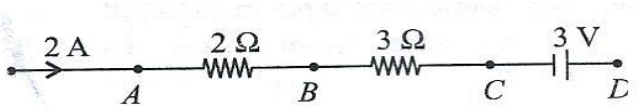
Q15. In given circuit, the value of current I_1,I_2 and I_3 are



(a) $3A, \frac{-3}{2}A, \frac{9}{2}A$ (b) $\frac{9}{2}A, 3A, \frac{-3}{2}A$

(c) $5A, 4A, -3A$ (d) $7A, \frac{5}{4}A, \frac{9}{2}A$

Q16. In the given circuit the potential at point B is zero,the potential at point A will be



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Q17.A battery of emf 15V and internal resistance 4Ω is connected to a resistor. If the current in the circuit is 2A and the circuit is closed. Resistance of the resistor and terminal voltage of the battery will be
(a)2.5Ω,6V (b)3.5Ω,6V(c)2.5Ω,7V(d)3.5Ω,7V

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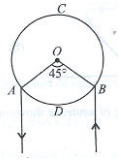


(a)1.64Ω (b)2.84Ω (c)4.57Ω (d)2.64Ω

Q19. The current in a wire varies with time according to the equation i=4+2t,where I is an ampere and t is in second. The quantity of charge which has to be passed through a cross-section of the wire during the time t=2 s to t=6 s is
(a)40 C (b)48 C (c)38 C (d)43C

Q20. The equivalent resistance of series combination of four equal resistor is S.If they are joined in parallel, the total resistance is P .The relation between S and P is given by S=nP,then the minimum possible value of n is
(a)12 (b)14 (c)16 (d)10

Answer's

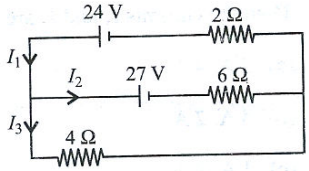
1	2	3	4	5	6	7	8	9	10
c	a	a	b	c	c	b	b	d	c

11	12	13	14	15	16	17	18	19	20
a	a	c	c	a	d	d	a	b	c

OBJECTIVE TEST Set -B **MM-80**

UNIT(1 &2)

Q15. In given circuit, the value of current I_1,I_2 and I_3 are



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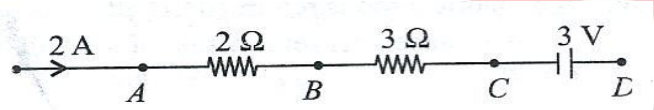

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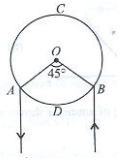

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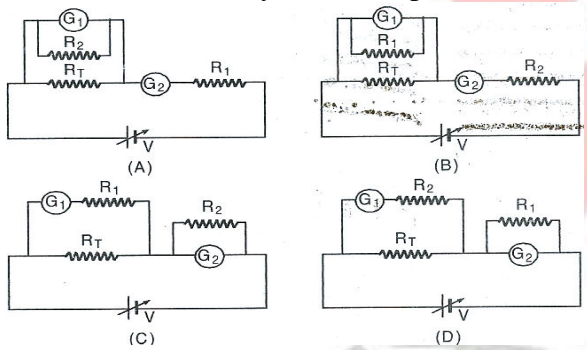

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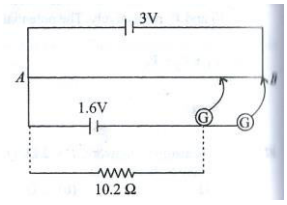

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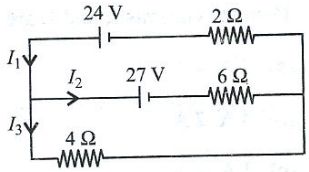

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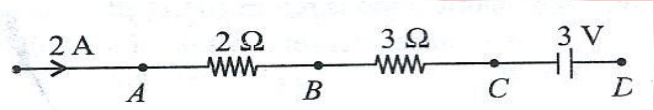

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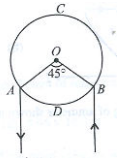

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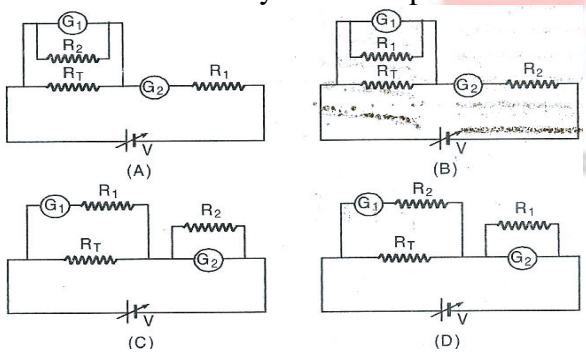

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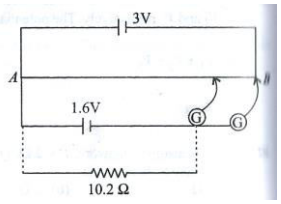

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