**INDIAN SCHOOL DARSAIT**
**DEPARTMENT OF PHYSICS**

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| Subject : Physics | Topic : Chapter 1,2&3 | Date of Worksheet : 18.8.19 |
| Resource Person: Susan Anil | | Objective type question |
| Name of the Student :_____ | Class & Div : XII____ | Roll No : __ |

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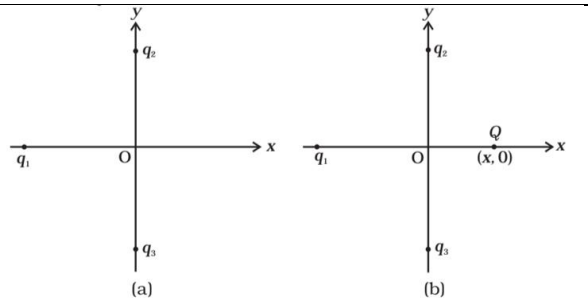
| 1) | A thin spherical conducting shell of radius R has a charge q. another charge Q is placed at the centre of the shell. The electrostatic potential at a point P at a distance R/2 from the centre of the shell is:<br>a) $\frac{2Q}{4\pi\varepsilon_0 R} - \frac{2q}{4\pi\varepsilon_0 R}$ b) $\frac{2Q}{4\pi\varepsilon_0 R} + \frac{q}{4\pi\varepsilon_0 R}$<br>c) $\frac{2Q}{4\pi\varepsilon_0 R}$ d) $\frac{2(q+Q)}{4\pi\varepsilon_0 R}$ |
| 2) | An electric charge $10^{-3}\mu C$ is placed at the origin (0, 0) of XY coordinate system. Two points A and B are situated at $(\sqrt{2}, \sqrt{2})$ and (2,0) respectively. The potential difference between the points A and B will be:<br>a) 0V b) 2V<br>c) 4.5V d) 9V |
| 3) | A sheet of Aluminium foil is introduced between the plates of a capacitor. The capacitance of the capacitor:<br>a) decreases b) Remains unchanged<br>c) Becomes infinite d) Increases |
| 4) | Some charge is being given to a conductor. Then its potential<br>a) Is maximum at surface b) Is maximum at centre<br>c) Remains same throughout the conductor d) Is maximum somewhere between surface and centre |
| 5) | A parallel plate capacitor is charged to a potential difference of V volt. After disconnecting the battery, the distance between the plates of the capacitor is increased using an insulating handle. As a result the potential difference between the plates:<br>a) Increases b) Decreases<br>c) Does not change d) Becomes zero |
| 6) | In the figure two positive charges q2 and q3 fixed along the y axis, exert a net electric force in the + x direction on a charge q1 fixed along the x axis. If a positive charge Q is added at (x, 0),the force on q1 |



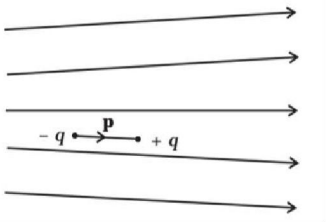

a) Shall increase along the positive x-axis.

b) Shall decrease along the positive x-axis.

c) Shall point along the negative x-axis.

d) Shall increase but the direction changes because of the intersection of Q with q2 and q3.

7) Figure shows electric field lines in which an electric dipole p is placed as shown. Which of the following statements is correct?




a) The dipole will not experience any force.

b) The dipole will experience a force towards right.

c) The dipole will experience a force towards left.

d) The dipole will experience a force upwards.

8) A point charge +q, is placed at a distance d from an isolated conducting plane. The field at a point P on the other side of the plane is

a) Directed perpendicular to the plane and away from the plane.

b) Directed perpendicular to the plane but towards the plane.

c) Directed radially away from the point charge.

d) Directed radially towards the point charge.

9) A hemisphere is uniformly charged positively. The electric field at a point on a diameter away from the centre is directed

a) perpendicular to the diameter

b) parallel to the diameter

c) at an angle tilted towards the diameter

d) at an angle tilted away from the diameter.

10) If $\oint E.ds = 0$ over a surface, then

a) the electric field inside the surface and on it is zero

b) the electric field inside the surface is necessarily uniform.

c) the number of flux lines entering the surface must be equal to the number of flux lines leaving it.

d) all charges must necessarily be outside the surface.

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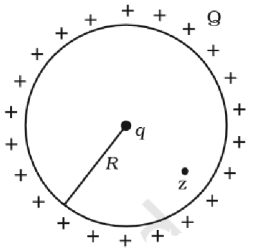
| 11) | A positive charge Q is uniformly distributed along a circular ring of radius R. A small test charge q is placed at the centre of the ring. Then<br>  <br><br>(a) If q > 0 and is displaced away from the centre in the plane of the ring, it will be pushed back towards the centre.<br>(b) If q < 0 and is displaced away from the centre in the plane of the ring, it will never return to the centre and will continue moving till it hits the ring.<br>(c) If q < 0, it will perform SHM for small displacement along the axis.<br>(d) q at the centre of the ring is in an unstable equilibrium within the plane of the ring for q > 0. |
| 12) | Which of the following characteristics of electrons determines the current in a conductor?<br>(a) Drift velocity alone.<br>(b) Thermal velocity alone.<br>(c) Both drift velocity and thermal velocity.<br>(d) Neither drift nor thermal velocity. |
| 13) | Kirchhoff 's junction rule is a reflection of<br>(a) Conservation of current density vector.<br>(b) Conservation of charge.<br>(c) The fact that the momentum with which a charged particle approaches a junction is unchanged (as a vector) as the charged particle leaves the junction.<br>(d) The fact that there is no accumulation of charges at a junction. |
| 14) | Temperature dependence of resistivity ρ (T) of semiconductors, insulators and metals is significantly based on the following factors:<br>(a) Number of charge carriers can change with temperature T.<br>(b) Time interval between two successive collisions can depend on T.<br>(c) Length of material can be a function of T.<br>(d) Mass of carriers is a function of T. |
| 15) | The measurement of an unknown resistance R is to be carried out using Wheatstone's bridge (see Fig. 3.25 of NCERT Book). Two students perform an experiment in two ways. The first students takes R2 = 10Ω and R1 = 5Ω. The other student takes R2 = 1000Ω and R1 = 500Ω. In the standard arm, both take R3 = 5Ω.Both find $R = \frac{R_2}{R_1} R_3 = 10\Omega$ Within errors.<br>(a) The errors of measurement of the two students are the same.<br>(b) Errors of measurement do depend on the accuracy with which R2 and R1 can be measured.<br>(c) If the student uses large values of R2 and R1, the currents through the arms will be feeble. This will make determination of null point accurately more difficult.<br>(d) Wheatstone bridge is a very accurate instrument and has no errors of measurement. |

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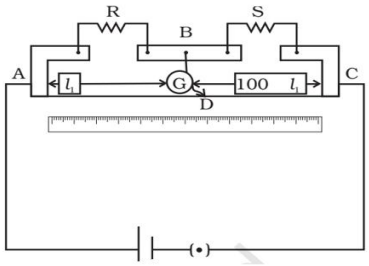
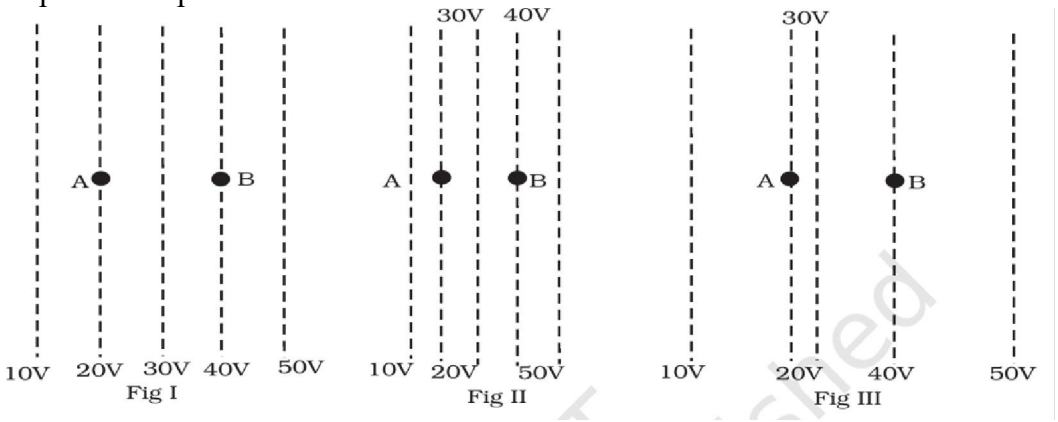
| 16) | In a meter bridge the point D is a neutral point (Fig 3.3).<br>  <br><br>(a) The meter bridge can have no other neutral point for this set of resistances.<br>(b) When the jockey contacts a point on meter wire left of D, current flows to B from the wire.<br>(c) When the jockey contacts a point on the meter wire to the right of D, current flows from B to the wire through galvanometer.<br>(d) When R is increased, the neutral point shifts to left. |
| 17) | Two cells of emf's approximately 5V and 10V are to be accurately compared using a potentiometer of length 400cm.<br>(a) The battery that runs the potentiometer should have voltage of 8V.<br>(b) The battery of potentiometer can have a voltage of 15V and R adjusted so that the potential drop across the wire slightly exceeds 10V.<br>(c) The first portion of 50 cm of wire itself should have a potential drop of 10V.<br>(d) Potentiometer is usually used for comparing resistances and not voltages. |
| 18) | A metal rod of length 10 cm and a rectangular cross-section of 1cm ×1/2 cm is connected to a battery across opposite faces. The resistance will be<br>(a) maximum when the battery is connected across 1 cm ×1/2 cm faces.<br>(b) maximum when the battery is connected across 10 cm × 1 cm faces.<br>(c) maximum when the battery is connected across 10 cm ×1/2 cm faces.<br>(d) same irrespective of the three faces. |
| 19) | Figure shows some equipotential lines distributed in space. A charged object is moved from point A to point B.<br>  <br><br>(a) The work done in Fig. (i) is the greatest.<br>(b) The work done in Fig. (ii) is least.<br>(c) The work done is the same in Fig. (i), Fig. (ii) and Fig. (iii).<br>(d) The work done in Fig. (iii) is greater than Fig. (ii)but equal to that in Fig. (i). |