**Q1) According to ohm’s law current flowing in a conductor is directly proportional to:**

1. Resistance
2. Voltage
3. Resistivity
4. Length of conductor

Correct Option: (b)

Explanation: According to ohm’s law V proportional to I

Difficulty Level- Easy

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**Q2) Property by which conductor opposes flow of charge is known as:**

1. Voltage
2. Resistivity
3. Resistance
4. Both (b) and (c)

Correct option: (d)

Explanation: Resistivity is property of conductor by virtue of which it opposes flow of charge.

Resistance depends on resistivity.

Difficulty Level- Easy

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**Q3)** **What is the application of potentiometer?**

1. Measuring current
2. Measuring internal resistance
3. Measuring external resistance
4. Used to compare two currents

Correct option: (b)

Explanation: A potentiometer is an electrical device used to measure electromotive force (emf), internal resistance, and to compare the emf’s of various cells. A potentiometer can also function as a variable resistor.

Hence option (b) is correct.

Difficulty Level- Easy

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**Q4)** **Correct statement about shunt resistance is?**

1. Shunt resistance is a term for a high resistance resistor.
2. Shunt resistance is a term for a low resistance resistor.
3. Shunt resistance is a term for a none resistance resistor.
4. None of these

Correct option: (b)

Explanation: Note that shunt resistance is a term for a low resistance resistor. It can be used to gauge how far it has been stretched. One can compute the current flowing through the load. by connecting the same shunt resistance in series with the load.

Hence, the correct option is (b).

Difficulty Level- Easy

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**Q5)** **Choose the correct statement about Galvanometer.**

a) It functions both with and without a magnetic field.

b) It gauges both direct and alternating current.

c) It is more precise.

d) Bridges and potentiometers both use it.

Correct option: (d)

Explanation: Note that, the galvanometer exhibits deflection when the magnet's South Pole is positioned close to the solenoid. The galvanometer indicates a swerve to the left when clockwise current travels through the solenoid coil.

Therefore, bridges and potentiometers employ it.

Hence, option (d) is correct.

Difficulty Level- Easy

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**Q6) In the absence of an external electric field, the average number of electrons going in any direction of a conductor is equal to:**

1. Zero.
2. the average number of electrons in the opposite direction.
3. Both a and b.
4. None of the above.

Correct Option: the average number of electrons in the opposite direction.

Explanation: As current is constituted by flow of charges, we don’t detect any current in a conductor until a potential difference is applied across it. Hence, we can conclude that the average number of electrons going in any direction in a conductor in the absence of an external electric field is equal to the number of electrons going in the opposite direction

Difficulty Level- Easy

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**Q7)** **What equipment has the highest resistance?**

1. A voltmeter
2. An ammeter.
3. Galvanometer.
4. None of these

Correct option: (a)

Explanation: Note that, if a voltmeter doesn't require any current from the circuit element to operate (has infinite resistance), it is considered to be perfect. Voltmeter is without a doubt the device with the highest internal resistance.

Thus, the appropriate choice is (a).

Difficulty Level- Easy

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**Q8) Material A has a larger electron affinity than Material B. If Material B is rubbed against Material A then which material will have excess negative charge:**

1. Material B
2. Material A
3. Both having same negative charge
4. Negative charge cannot occur.

Correct option: (b)

Explanation: If any material has large electron affinity then it means it can attract electrons more as compared to other materials so material A has large electron affinity so it can attract electrons and become negative charge.

Hence the correct option is (b)

Difficulty Level- Easy

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**Q9) A glass rod rubs with a silk cloth together and the glass rod becomes positively charged. Which of the following statements is true?**

1. The glass rod gained protons during the rubbing process.
2. If the glass acquires a charge of +5 units, then the cloth acquires a charge of -6 units.
3. Electrons are transferred from glass to cloth.
4. In general, glass materials must have a greater affinity for electrons than cloth materials.

Correct option: (c)

Explanation: When two bodies get rubbed then due to rubbing some heat gets produced and this heat will work as ionization energy for the glass rod and electrons will eject out from it and the glass rod becomes positively charged.

Hence the correct option is (c)

Difficulty Level- Easy

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**Q10) Which statement best explains why a rubber rod becomes negatively charged when rubbed with fur?**

1. Protons get transferred from rubber rods.
2. Rubber rod has less electron affinity than fur.
3. Molecules in the rubber rod have a stronger attraction for electrons than the molecules in the fur.
4. Molecules in the fur have a stronger attraction for electrons than the molecules in the rubber rod.

Correct option: (c)

Explanation: If any material has large electron affinity then it means it can attract electrons more as compared to others so rubber has large electron affinity so it can attract electrons and become negative charge.

Hence the correct option is (c)

Difficulty Level- Easy

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**Q11) Temperature coefficient of resistance of metal is:**

1. positive
2. negative
3. zero
4. cannot be predicted

Correct Option: (a)

Explanation: As when we increase temperature of metal its resistance increases, so temperature coefficient of resistance of metal is positive.

Hence, correct option is (a)

Difficulty Level- Medium

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**Q12) Temperature coefficient of resistance of semiconductor is:**

1. positive
2. negative
3. zero
4. cannot be predicted

Correct Option: (b)

Explanation: As when we increase temperature of metal its resistance decreases, so temperature coefficient of resistance of semiconductor is negative.

Hence, correct option is (b)

Difficulty Level- Medium

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**Q13) Temperature coefficient of resistance of alloy is:**

1. positive
2. negative
3. zero
4. near to zero

Correct Option: (d)

Explanation: As when we increase temperature of alloy material its resistance approximately remains same, so temperature coefficient of resistance of alloy is said to be approximately equal to zero.

Hence, correct option is (d)

Difficulty Level- Medium

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**Q14) Value of resistivity depends on:**

1. Shape of conductor
2. Length of conductor
3. Material of conductor
4. Area of conductor

Correct Option: (c)

Explanation: Resistivity is fundamental property of a material so its value depends only on type of material

Hence, correct option is (c)

Difficulty Level- Medium

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**Q15)** **What is the use of jockey in meter bridge?**

1. To determine the length of the wire
2. To determine the null point of the bridge
3. To determine the radius of the meter bridge
4. Both (a) and (b)

Correct Option: (b)

Explanation: Jockey: On the bridge wire, the jockey is utilised for sliding. It's a metal rod with a knife edge on one end. After that, slide the jockey along the wire while adjusting the resistance value in the resistance box. Continually repeat this technique until the galvanometer registers a zero or null deflection.

Whereas, Null Deflection can be defined as:

The galvanometer’s null deflection point is the location where there is no deflection visible. Jockey is moved along the length of the potentiometer wire in order to obtain the zero reading in the galvanometer. The null deflection is reached at a specific location, and that length is referred to as balanced length.

Thus, Option B is the correct option.

Difficulty Level- Medium

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**Q16) Statement:**

1. **Charges move from lower concentration to higher concentration**
2. **Conservation of charge is an analogy to the conservation of energy**

**Chose the correct option**

1. I True & II false
2. Both are true
3. Both are false
4. I false & II true

Correct option: (d)

Explanation:

1.Charges are similar to water flow. Moves from higher concentration to lower concentration. So, the statement is false.

2. Conservation of charges means neither charges created nor destroyed. But charges can be transferred into one form to another. This is similar to the conservation of energy. So, the statement is true.

Hence the correct option is (d).

Difficulty Level- Medium

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**Q17) Two-point charges of the same nature are placed 2 light years apart. One of the charges is displaced towards the other charge by 1m. At that instance as soon as the distance between them is reduced,**

1. Force of repulsion between them increases
2. Force of attraction between them increases
3. Force between them remains the same
4. Can’t say

Correct option: (c)

Explanation: The force on one charge due to other is due to the fact that a charge in space produces electric field. So once any other charge is brought in the region of influence of the other, it experiences a force due to the electric field of the other. As soon as the charge is taken 1m closer to the other charge, the electric field at the point where the other is located will change and as a result the force will increase. But no information can be transmitted from one point to another point greater than the speed of light. The two charges are at a distance of two light years apart. Hence it will take a period of minimum two years for the electric field at the point where the other charge is located to change due to the reduction in the distance between them. Therefore, at that instance as soon as the distance between them is reduced, force between them remains the same.

Hence the correct option is c.

Difficulty Level- Medium

$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$  
**Q18) When a dielectric slab is placed between two like charges, the net interaction on each charge:**

1. Decrease
2. Increase
3. Same
4. May increase or decrease

Correct option: (a)

Explanation: The polarisation of the slab happens in a way that the force applied on each point charge due to induced charges on the slab is opposite to the force acting on them due to each other. Hence, the net interaction decreases.

Difficulty Level- Medium

$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$  
**Q19) Identify the false statement.**

1. Inside a charged or neutral conductor electrostatic field is zero
2. The electrostatic field at the surface of the charged conductor must be tangential to the surface at any point.
3. There is no net charge at any point inside the conductor
4. Electrostatic potential is constant throughout the volume of the conductor.

Correct option: (b)

Explanation: Because, the electrostatic field at the surface of a conductor is normal to the surface.

Difficulty Level- Medium

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**Q20) Choose the correct option regarding the charge densities of conductors vary on an irregularly shaped conductor.**

1. High at flat portion
2. High at sharp portion
3. Low at sharp portion
4. Low at sharp portion and high at flat portion

Correct option (b)

Explanation: Because for an irregularly shaped conductor, the surface charge density is non-uniform and it is greatest at the locations where the radius of curvature of the surface is smallest.

Difficulty Level- Medium

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**Q21) Two cylindrical conductors of equal volume and of same material Carry equal current if one is longer and the other one is shorter, respectively, which of the two will have higher current density?**

1. Both will have same current density
2. longer one will have more current density
3. shorter one will have more current density
4. data insufficient

Correct Option: (b) longer one will have more current density

Explanation**: S**ince both the cylindrical conductors have equal volume the longer one must have a shorter radius hence lesser cross sectional area hence it will have more current density than the short one.

Difficulty Level- Hard

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**Q22) Mobility of electrons is……………… than mobility of holes:**

1. greater
2. smaller
3. equal
4. depends on the type of conductor

Correct Answer: a) greater

Explanation: Mobility of electrons is roughly 3 times larger than the mobility of holes as holes are closer to the valence band and have higher effective mass than electrons.

Difficulty Level- Hard

$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$  
**Q23)** **Which of these statements is accurate of the voltmeter?**

1. It is a tool for displaying the magnitude of potential differences between two places in a circuit.
2. It is a device that displays how much current is flowing through a circuit.
3. It is a device for determining how much current is flowing through a circuit.
4. All of these

Correct option: (a)

Explanation: Note that, it is a tool for displaying the magnitude of potential differences between two places in a circuit.

Hence, the correct option is (a).

Difficulty Level- Hard

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**Q24)** **Why can't a galvanometer serve as an ammeter alone?**

1. The lowest galvanometer deflection will occur. Consequently, if a small current is sent through the galvanometer, it could be damaged.
2. The greatest galvanometer deflection will occur. Consequently, if a large current is sent through the galvanometer, it could be damaged.
3. The greatest ammeter deflection will occur. Consequently, if a large current is sent through the galvanometer, it could be damaged.
4. None of these

Correct option: (b)

Explanation: Note that, the maximum galvanometer deflection will occur at a very low a few micro amps of current. Therefore, if a large current is sent through the galvanometer, it could be damaged. Considering that the galvanometer's resistance is greater than that of the ammeter, connecting them in series will lower the current flowing through the circuit.

As a result, the appropriate choice is (b).

Difficulty Level- Hard

$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$  
**Q25) Consider a hollow spherical conductor that has a potential of 300 volts at its outside surface. The potential inside the hollow space must be-**

1. Zero at the centre and rising to some thing less then 300 V at the edge of the hollow space.
2. Zero at outer part and rising to 300 volts at centre.
3. Zero every where
4. 300V everywhere

Correct Option: d)

Explanation:As we know, the potential inside the hollow space must be 300 everywhere. Because the potential inside the hollow or solid conductor remains constant and equal to the potential on the surface of the conductor.

Difficulty Level- Hard

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**Q26) Choose the correct statement:**

1. In northern hemisphere of the earth, the south pole of the needle gets depressed below the horizontal.
2. In northern hemisphere of the earth, the north pole of the needle gets depressed above the horizontal.
3. In northern hemisphere of the earth, the north pole of the needle aligns itself parallel to the horizontal.
4. In northern hemisphere of the earth, the north pole of the needle gets depressed below the horizontal.

Correct Option: d)

Explanation:The magnetic south pole of the Earth lies in northern hemisphere. Hence the north pole of the magnetic needle gets depressed below the horizontal in northern hemisphere.

Difficulty Level- Hard

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**Q27)** **Angle of dip varies between:**

1. It varies between 0° and 90°.
2. It varies between 0° and 180°.
3. It varies between 0° and 360°.
4. It varies between +90° and -90°.

Correct Answer: a)

Explanation:Either the magnetic needle becomes completely vertical (at poles) or it aligns itself parallel to the horizontal component of Earth’s magnetic field.

Difficulty Level- Hard

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**Q28) A compass placed between the magnetic and geographic North Poles will point directly …………………, away from the geographic pole and toward the magnetic pole, resulting in a magnetic declination of about ……………… degrees.**

1. South, 180
2. North, 180
3. South, 0
4. North, 0

Correct option (a)

Explanation:A compass placed between the magnetic and geographic North Poles will point directly south, away from the geographic pole and toward the magnetic pole, resulting in a magnetic declination of about 180°.

Difficulty Level- Very Hard

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**Q29) What will be the magnetic declination at a place if the magnetic bearing of the sun at noon is 170° ?**

1. 10°E
2. 8°E
3. 4°E
4. 10°W

Correct option (a)

Explanation: The sun is exactly on the geographical meridian.

Hence the true bearing of the sun at noon is zero or 180° depending upon whatever it is to the north of the place or to the south of the place.

If, true bearing = magnetic bearing + declination

⟹170° + θ = 180°

⟹ θ = 10°E

Difficulty Level- Very Hard

$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$  
**Q30) What will be the magnetic declination at a place if the magnetic bearing of the sun at noon is 180°?**

1. 4°W
2. 0°
3. 4°E
4. 8°

Correct option (d)

Explanation: The sun is exactly on the geographical meridian.

Hence the true bearing of the sun at noon is zero or 180° depending upon whatever it is to the north of the place or to the south of the place.

If, true bearing = magnetic bearing + declination

⟹180° + θ = 180°

⟹ θ = 0°

Difficulty Level- Very Hard