**OUR OWN HIGH SCHOOL, Al WARQA’A, DUBAI**

**ELECTRICITY (BOARD PAPER QUESTIONS)**

**Grade: X**

**Subject: Physics Date: 22/06/2016**

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| 1  | Calculate the work done in moving a charge of 2 coulombs across two points having a potential difference of 12V. |
| 2 | Define resistance. Write the SI unit of resistance and define it. Match the correct range of resistivity with the materials given. |
| 3 | State Ohm’s law. Express it mathematically. Draw circuit diagram for its experimental verification. Draw the pattern of graph between potential difference and current. |
| 4 | (i) How will you convert a given set of resistors so that the equivalent resistance is increased? Give reason for your answer.In the above circuit diagram, calculate :(a) the value of current through each resistor.(b) the total current in the circuit.(c) the total effective resistance of the circuit. |
| 5 | (i) Draw a diagram to show how two resistors R1 and R2 are connected in parallel. (ii) In a circuit if two resistors of 4Ω and 8Ω are connected in parallel, find out the ratio of current passing through the two resistors. |
| 6 | (a) What is meant by potential difference? State its SI unit.(b) Name a device that helps to maintain a potential difference across a conductor.(c) Calculate: (i) the highest (ii) the lowest resistance that can be obtained by the combination of four coils of resistances 4Ω, 8Ω, 12Ω and 24Ω? |
| 7 | Out of the two wires X and Y shown below which one has greater resistance. Justify your answer? |
| 8 | Find: (a) the highest (b) the lowest value of resistance that can be secured by the combination of four resistors of 4 ohms, 8 ohms, 12 ohms and 24 ohms. |
| 9 | Name and define S.I unit of resistance. Calculate the resistance of a resistor if the current flowing through it is 200 mA, when the applied potential difference is 0.8V. |
| 10 | (a) Nichrome wire of length l and radius ‘r’ has resistance of 10 Ω. How would the resistance of the wire change when:(i) Only length of the wire is doubled? (ii) Only diameter of the wire is doubled? Justify your answer. (b) Why element of electrical heating devices are made up of alloys? |
| 11 | Three resistors of 5 Ω, 10 Ω and 15 Ω are connected in series and the combination is connected to battery of 30V. Ammeter and voltmeter are connected in the circuit. Draw a circuit diagram to connect all the devices in proper correct order. What is the current flowing and potential difference across 10 Ω resistance? |
| 12 | (a) Calculate the resistance of the wire using the graph.(b) How many 176Ω resistors in parallel are required to carry 5A on a 220 V line?(c) Define electric power. Derive relation between power, potential difference and resistance. |
| 13 | State any two factors on which the resistance of a cylindrical conductor depends. Compare the resistance of a conductor of length ‘l’ and area of cross section ‘a’ with that of another conductor of same material but of length and area of cross section half and double respectively of the former. |
| 14 | How you would connect three resistors each of resistance 6 Ω so that the combination has a resistance of (i) 9 Ω (ii) 4 Ω? Justify your answer. |
| 15 | Draw a schematic diagram of circuit consisting of a battery of 1.5V and three resistances of 5Ω, 4Ω, 3Ω respectively joined in series with an ammeter and a key. Find out the current in the circuit. |
| 16 | A resistance wire is stretched to double its length so that its area of cross – section is halved. How will its resistance change? Will any change be observed in its resistivity? Justify your answer. |
| 17 | A battery of 12 V is connected to a series combination of resistors, 3Ω, 4Ω, 5Ω, and 12Ω. How much current would flow through the 12Ω resistor? |
| 18 | Find out the following in the electric circuit given in the figure.(a) Effective resistance of two 8Ω resistors in the combination. (b) Current flowing through 4Ω resistor.(c) Potential difference across 4Ω resistor (d) Power dissipated in 4 Ω resistor. (e) Difference in readings of ammeter A1 and A2 if any. |
| 19 | (a) State ohm’s law. (b) Draw a circuit diagram for the verification of Ohm’s law. (c) The potential difference between the terminals of an electric heater is 60 V when it draws current of 4 A from the source. What current will the heater draw if the potential difference is increased to 120 V. |
| 20 | (a) Resistors given as R1, R2 and R3 are connected in series to a battery V. Draw the circuit diagram showing the arrangement. Derive an expression for the equivalent resistance of the combination. (b) If R1 =10Ω, R2=20Ω and R3= 30Ω, calculate the effective resistance when they are connected in series to a battery of 6V. Also find the current flowing in the circuit. |
| 21 | (a) Two students perform experiments on two given resistors R1 and R2 and plot the following V – I graphs. If R1 > R2, which of the two diagrams correctly represent the situation on the plotted curves? Justify your answer.(b)An electric lamp of 24Ω and a conductor of 6Ω are connected in parallel to a 12V battery. Calculate.(i) Total resistance (ii) Total current in the circuit (iii) Potential difference across the conductor. |
| 22 | Define potential difference between two points in an electric circuit. State its S.I. unit. Name the device used to measure potential difference between two points in an electric circuit. |
| 23 | A piece of wire of resistance 6Ω is connected to a battery of 12V. Find the amount of current flowing through it. Now, the same wire is redrawn by stretching it to double its length, find the resistance of the new (redrawn) wire. |
| 24 | Define electric current. Name the device used to measure electric current in a circuit. How is it connected in the circuit? |
| 25 | Define resistance of a conductor. State two factors on which resistance of a conductor depends by stating the dependence also. Calculate the resistance of 50m length of wire of cross - sectional area 0.01 mm2 and of resistivity 5 X 10-8 Ωm. |
| 26 | State the law that gives the relationship between the potential difference (V) across the two ends of a conductor and the current (I) flowing through it. Describe an activity to verify this law. Draw circuit diagram for its verification. What type of graph is obtained between V and I. |
| 27 | For the circuit given below, calculate –(i) Current through each resistor. (ii) Total current in the circuit. (iii) Total resistance in the circuit. |
| 28 | Find the equivalent resistance of the following circuit- |
| 29 | Find out the reading of ammeter and voltmeter in the circuit given below : |
| 30 | List in a tabular form two differences between a voltmeter and an ammeter. |  |
| 31 | Draw a schematic diagram of a circuit consisting of a battery of five 2V cells, a 5 ohm, a 10 ohm and a 15 ohm resistor and a plug key all connected in series. Calculate the electric current passing through the above circuit when the key is closed. |  |
| 32 | (i) List three factors on which the resistance of a conductor depends. (ii) Write the SI unit of resistivity. |  |
| 33 | Copper wire has diameter 0.5 mm and resistivity 1.6 X 10-8Ωm. Calculate the length of this wire to make its resistance 10Ω. How much does the resistance change if the diameter is doubled without changing its length? |  |
| 34 | Describe an activity to show the variation of resistance on length of wire. A wire of given material having length L and area of cross-section A, has a resistance of 20Ω. What would be the resistance of another wire of the same material having length L/2 and area of cross-section 2 A? |  |
| 35 | State ohm’s law. Represent it graphically. In the given circuit diagram calculate (i) the total effective resistance of the circuit. (ii) the current through each resistor. |  |
| 36 | (a) Define one ampere. (b) Prove that the equivalent resistance of three resistors R1, R2 and R3 in series is R1 + R2+ R3 (c) You have four resistors of 8Ω each. Show how you would connect these resistors to have effective resistance of 8Ω. |  |
| 37 | (a) Define one volt. (b) Draw symbols of the following components as used in circuit diagrams:(i) electric bulb (ii) ammeter |  |
| 38 | For the circuit shown in the diagram calculate :-(i) the value of current through each resistor. (ii) the total current drawn from the battery. (iii) the total effective resistance of the circuit. |  |
| 39 | (i) Define resistance and its S.I unit. (ii) List two factors on which the resistance of a conductor depends. (iii) The resistivity of copper is 1.7x10-8 Ω-m. What length of copper wire of diameter 0.1 mm will have a resistance of 34Ω? |  |
| 40 | Find the total resistance between the points A and B in the circuit diagram shown. |  |
| 41 | The values of current I flowing in a given resistor for the corresponding valued of potential difference V across the resistor are given below:(i) Plot a graph between V and I. (ii) Calculate the resistance of the resistor from the graph.(iii) What does the graph represent? Name and state the law. |  |
| 42 | A current of 0.5 A is drawn by a filament of an electric bulb for 10 minutes. Find the amount of charge that flows through the circuit. |  |
| 43 | For the circuit shown calculate:(i) the total effective resistance of the circuit. (ii) the value of current through each resistor and (iii) the total current drawn from the battery. |  |
| 44 | Describe an activity to show the variation of resistance on material of the conductor. |  |
| 45 | Define resistivity. State its S.I unit? Mention the effect of temperature on the resistivity of a material. There are two conductors A and B of the same material of length l and 2l and radii r and r/2 respectively. Find the ratio of their resistance. |  |
| 46 | Describe an activity to show the variation of resistance with area of cross section of a conductor. |  |
| 47 | Define SI unit of resistance. How is (i) an ammeter and (ii) a voltmeter connected in an electric circuit? A set of ‘n’ identical resistors each of resistance R are connected in series and the effective resistance is found to be ‘X’. When these ‘n’ resistors are connected in parallel, the effective resistance is found to be ‘Y’. Find the ratio X/Y. |  |
| 48 | (a) Define one volt. (b) 100 J work is done in transferring 20 C of charge between two points in a conductor. Find the resistance offered by the conductor if a current of 2A flows through it. |  |
| 49 | State the physical quantity which is equal to the ratio of potential difference and current. Define its SI unit. |  |
| 50 | (a) Define electric resistance of a conductor. List two factors on which the resistance of a conductor depends. (b) Resistance of a metal wire of length 1m is 26Ω at 200C. If the diameter of the wire is 0.3 mm, what will be the resistivity of the metal at that temperature? |  |
| 51 | State with the help of a circuit diagram an activity to find the resistance ‘R’ of a given wire. A current of 0.2 A passes through a resistor of 20Ω. Find the potential difference across its ends. |  |
| 52 | Mention the condition under which charges can move in a conductor. Name the device which is used to maintain this condition in an electric circuit. |  |
| 53 | Define '1 Volt'. State the relation between work, charge and potential difference for an electric circuit. Calculate the potential difference between two terminals of the battery if 100 Joules of work is required to transfer 20 Coulombs of charge from one terminal of the battery to the other. |  |