CBSE CLASS X

Science (086)

QUESTION PAPER

From previous CBSE Board Exam questions

Code: T4QIMM **Questions: 93** **Maximum Marks: 235** **Generated: 2026-06-15 13:05**

SELECTIONS USED

Source	Previous-year board
Subject	Science
Lessons	Electricity
Year	2022-2026
Questions selected	93

Composition — Types: 28 Short · 22 MCQ · 15 Very short · 13 Long · 5 Case-based · 5 source_based · 3 Assertion–reason

Q1. § Chapter Introduction § 11.7.1 Practical Applications of Heating Effect of Electric Current **[2]**

A fuse in electric circuit is rated 4 A. Can it be used with an electric heater of rating 2 kW, 200 V ? Explain your answer.

Previously asked in: 2026 31/4/1 Q33 (A)

◆ **Electricity** Electric Power and Fuse Rating

Q2. § Chapter Introduction § 11.1 ELECTRIC CURRENT AND CIRCUIT § 11.3 CIRCUIT DIAGRAM **[1]**

In domestic electric circuits the wiring with 15 A current rating is for the electric devices which have

(a) higher power ratings such as geyser.
(b) lower power ratings such as fan.
(c) metallic bodies and low power ratings.
(d) non-metallic bodies and low power ratings.

Previously asked in: 2023 31/1/1 Q14

◆ **Electricity** Domestic Electric Circuits – Current Rating and Wiring

Q3. § Chapter Introduction **[1]**

Assertion (A) : In the common domestic circuits the earth wire is connected to a metallic plate buried deep inside the earth.
Reason (R) : Earth wire ensures that any leakage of current to the metallic body of the appliance keeps its potential to that of the earth, so the user may not get a severe electric shock.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Previously asked in: 2025 31/6/1 Q19

◆ **Electricity** Domestic Electric Circuits and Safety – Earth Wire

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Q4. § 11.2 ELECTRIC POTENTIAL AND POTENTIAL DIFFERENCE **[1]**

Assertion (A) : Electrons move from lower potential to higher potential in a conductor.
Reason (R) : A dry cell maintains electric potential difference across the ends of a conductor.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Previously asked in: 2024 31/5/1 Q19

◆ **Electricity** | Electron flow and conventional current direction in a conductor | Role of a cell in maintaining potential difference

Q5. § 11.4 OHM'S LAW | § 11.6.2 Resistors in Parallel | § 11.8 ELECTRIC POWER

Answer the following : Define volt, the unit of potential difference.

Previously asked in: 2026 31/4/1 Q34 (a)

◆ **Electricity** | Potential Difference and Volt (Definition)

Q6. § 11.4 OHM'S LAW | § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS | § 11.6.2 Resistors in Parallel

Answer the following : Calculate the work done required to move an electron between two points A and B located at a potential difference of 100 V in an electric field.

Previously asked in: 2026 31/4/1 Q34 (b)

◆ **Electricity** | Potential Difference and Volt (Definition)

Q7. § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS **[3]**

The resistance of a wire of 0.01 cm radius is 7 ohms. If the resistivity of the material of the wire is 44×10^{-6} ohm meter, calculate the length of the wire.

Previously asked in: 2025 31/5/1 Q32

◆ **Electricity** | Resistivity and Calculation of Length of Wire using $R = \rho L/A$

Q8. § Chapter Introduction | § 11.3 CIRCUIT DIAGRAM **[3]**

Explain the meaning of overloading of an electrical circuit. List two possible causes due to which overloading may occur in household circuits. Write one preventive measure that should be taken to avoid overloading of domestic circuits.

Previously asked in: 2023 31/2/1 Q32

◆ **Electricity** | Overloading of Electrical Circuits

Q9. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[1]**

If four identical resistors, of resistance 8 ohm, are first connected in series so as to give an effective resistance R_s, and then connected in parallel so as to give an effective resistance R_p, then the ratio R_s/R_p is

(a) 32
(b) 2
(c) 0.5
(d) 16

Previously asked in: 2023 31/1/1 Q13

◆ **Electricity** | Series and Parallel Combination of Resistors – Ratio of Effective Resistance

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Q10. § 11.4 OHM'S LAW § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS **[5]**

Answer the following parts:

(i) When is the potential difference between two points said to be 1 volt ? [2]

(ii) A copper wire has a diameter of 0·2 mm and resistivity of $1{\cdot}6 \times 10^{-8}\ \Omega$ m. What will be the length of this wire to make its resistance 14 Ω ? How much does the resistance change, if the diameter of the wire is doubled ? [3]

Previously asked in: 2024 31/5/1 Q36 (b)

◆ **Electricity** Electric Potential Difference – definition of 1 volt Resistivity and resistance calculation using R = ρl/A

Q11. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[1]**

For verification of Ohm's law, we design an electrical circuit diagram in which we show the arrangement of different circuit components. We find that with respect to the resistor, the :

(a) ammeter is connected in parallel and the voltmeter in series.
(b) ammeter is connected in series and the voltmeter in parallel.
(c) ammeter and voltmeter are both connected in series.
(d) ammeter and voltmeter are both connected in parallel.

Previously asked in: 2023 31/2/1 Q14

◆ **Electricity** Verification of Ohm's Law – Circuit Diagram and Component Arrangement

Q12. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS § 11.6.2 Resistors in Parallel **[2]**

A wire of resistance R is cut into three equal parts. If these three parts are then joined in parallel, calculate the total resistance of the combination so formed.

Previously asked in: 2025 31/1/1 Q25(a)

◆ **Electricity** Resistors in Parallel – Combination of resistances

Q13. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[3]**

Consider the following electric circuit :

(a) The total resistance of the circuit [1]

(b) The total current drawn from the source [1]

(c) Potential difference across the parallel combination of 10 Ω and 15 Ω resistors [1]

Previously asked in: 2025 31/1/1 Q32

◆ **Electricity** Ohm's Law – Current and Voltage calculations Series and Parallel Combination of Resistors

Q14. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[2]**

Show how you would connect three resistors each of resistance 6 Ω, so that the combination has a resistance of 9 Ω. Also justify your answer.

Previously asked in: 2024 31/1/1 Q25(A)

◆ **Electricity** Combination of Resistors – Series and Parallel

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Q15. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[1]**

Four identical resistors of 12 Ω each are connected in series to form a square ABCD as shown in the figure. The resistance of the network between the two points 1 and 2 is :

(A) 48 Ω
(B) 36 Ω
(C) 9 Ω
(D) 6 Ω

Previously asked in: 2025 31/2/1 Q15

◆ **Electricity** Combination of Resistors – Series and Parallel (Network/Square Circuit)

Q16. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS § 11.6.1 Resistors in Series **[3]**

Three resistors of 2 Ω, 3 Ω and 6 Ω are connected in (i) series, and (ii) parallel. Draw the arrangements of the resistors and find the equivalent resistance of each arrangement.

Previously asked in: 2025 31/2/1 Q32

◆ **Electricity** Circuit Diagram Drawing for Series and Parallel Combinations Resistors in Parallel – Equivalent Resistance Resistors in Series – Equivalent Resistance

Q17. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[1]**

The maximum resistance of a network of five identical resistors of 1/5 Ω each can be –

(A) 1 Ω
(B) 0.5 Ω
(C) 0.25 Ω
(D) 0.1 Ω

Previously asked in: 2024 31/2/1 Q14

◆ **Electricity** Series and Parallel Combination of Resistors – Maximum Resistance

Q18. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS § 11.6.1 Resistors in Series **[4]**

> As shown in the diagram, an electric circuit consisting of an ammeter, a voltmeter, 4 cells of 1·5 V each, a plug key with a gap XY was set up. Voltmeter and ammeter readings were recorded in the observation table for four arrangements as given below :
> Arrangement No. 1 – only resistor R_1 in gap XY
> Arrangement No. 2 – only resistor R_2 in gap XY
> Arrangement No. 3 – Resistors R_1 and R_2 in series in gap XY
> Arrangement No. 4 – Resistors R_1 and R_2 in parallel in gap XY
> Based on the observations, four V – I graphs A, B, C and D as shown in figure were drawn.

Read the following case and answer the questions that follow.

(a) Which one of the graphs represents the series combination of R_1 and R_2 ? [1]

(b) Which one of these graphs represents the parallel combination of R_1 and R_2 ? [1]

(c) (i) Show an arrangement of three resistors, each of resistance 10 Ω, so that the combination has a resistance of 15 Ω. Give justification for your answer. [2]

Previously asked in: 2025 31/3/1 Q39

◆ **Electricity** Equivalent Resistance of Combined Resistors Series and Parallel Combinations of Resistors

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Q19. § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[2]**

Calculate the equivalent resistance of the following electric circuit:

Previously asked in: 2022 31/3/1 Q4(b)

◆ **Electricity** Equivalent Resistance of Series and Parallel Combinations

Q20. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[1]**

Consider the following combinations of resistors :

The combinations having equivalent resistance 1 Ω is/are :

A I and IV
B Only IV
C I and II
D I, II and III

Previously asked in: 2024 31/4/1 Q13

◆ **Electricity** Equivalent Resistance of Series and Parallel Combinations

Q21. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS § 11.6.2 Resistors in Parallel **[4]**

> An electric circuit diagram showing resistors arranged in three arms A, B and C connected to a battery and an ammeter.

Study the following electric circuit in which the resistors are arranged in three arms A, B and C:

(a) Find the equivalent resistance of arm A. [1]

(b) Calculate the equivalent resistance of the parallel combination of the arms B and C. [1]

(c) Internal choice: [2]

Previously asked in: 2022 31/3/1 Q14

◆ **Electricity** Mixed/combined series-parallel circuits Parallel combination of resistors (equivalent resistance) Series combination of resistors (equivalent resistance of an arm)

Q22. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[3]**

Answer the following:

(a) State Ohm's law. Write formula for the equivalent resistance R_p of the parallel combination of three resistors of values R_1, R_2 and R_3.

(b) Find the resistance of the following network of resistors :

Previously asked in: 2024 31/3/1 Q33

◆ **Electricity** Equivalent Resistance in Parallel Combination Ohm's Law Resistance of a Resistor Network (Series-Parallel Combination)

Q23. § 11.7.1 Practical Applications of Heating Effect of Electric Current

Answer the following: Why does an electric bulb become dim when an electric heater in parallel circuit is switched ON ?

Previously asked in: 2026 31/5/1 Q37 (a)

◆ **Electricity** Effect of adding a parallel load on circuit current and terminal voltage

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Q24. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS

Answer the following: How to connect three resistors each of resistance 8 Ω, so that the equivalent resistance of the combination is 12 Ω ? Draw diagram of the combination and justify your answer.

Previously asked in: 2026 31/5/1 Q37 (b)

◆ **Electricity** | Combination of Resistors – Mixed (Series and Parallel) to Achieve Equivalent Resistance | Equivalent Resistance of Series and Parallel Combinations

Q25. § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS | § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS | § 11.6.1 Resistors in Series **[4]**

> Study the following circuit :

On the basis of this circuit, answer the following questions :

(a) Find the value of total resistance between the points A and B. [1]

(b) Find the resistance between the points B and C. [1]

(c) Answer either (i) or (ii): [2]

Previously asked in: 2024 31/4/1 Q39

◆ **Electricity** | Equivalent Resistance Calculation | Series and Parallel Combination of Resistors

Q26. § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS | § 11.6.1 Resistors in Series | § 11.6.2 Resistors in Parallel **[1]**

The correct way to connect an ammeter and a voltmeter in an electric circuit is :

(A) Ammeter in parallel and voltmeter in series
(B) Ammeter and voltmeter both in parallel
(C) Ammeter in series and voltmeter in parallel
(D) Ammeter and voltmeter both in series

Previously asked in: 2026 31/3/1 Q30

◆ **Electricity** | Connection of Ammeter and Voltmeter in a Circuit

Q27. § 11.6.1 Resistors in Series **[4]**

> An electrical circuit diagram in which nine identical resistors of 3 Ω each are connected as shown. Ammeter A1 reads 1 ampere.

Answer the questions based on the following electrical circuit diagram:

(a) What is the relationship between the readings of A1 and A3 ? Give reasons for your answer. [1]

(b) What is the relationship between the readings of A2 and A3 ? [1]

(c) Determine the reading of the voltmeter V1. [2]

Previously asked in: 2023 31/2/1 Q39

◆ **Electricity** | Ammeter and Voltmeter Readings in Circuits | Ohm's Law Application | Series and Parallel Combinations of Resistors

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Q28. § 11.6.1 Resistors in Series **[1]**

Two LED bulbs of 12W and 6W are connected in series. If the current through 12W bulb is 0.06A the current through 6W bulb will be :

(a) 0.04A
(b) 0.06A
(c) 0.08A
(d) 0.12A

Previously asked in: 2023 31/4/1 Q13

◆ **Electricity** Current in Series Circuit

Q29. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS § 11.6.1 Resistors in Series § 11.6.2 Resistors in Parallel **[4]**

> Two resistors X (3 Ω) and Y (6 Ω) joined in series with a battery of 2 V, along with a voltmeter and ammeter.

Study the circuit shown in which two resistors X and Y of resistances 3 Ω and 6 Ω respectively are joined in series with a battery of 2 V.

(I) Draw a circuit diagram showing the above two resistors X and Y joined in parallel with same battery and same ammeter and voltmeter. [1]

(II) In which combination of resistors will the (i) potential difference across X and Y and (ii) current through X and Y, be the same ? [1]

(III) Answer either (a) or (b). [2]

Previously asked in: 2025 31/6/1 Q39

◆ **Electricity** Potential difference and current in series vs parallel circuits Series and Parallel Combinations of Resistors Voltmeter and Ammeter placement in circuits

Q30. § 11.4 OHM'S LAW § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS § 11.6.2 Resistors in Parallel **[1]**

In the following diagram, the position of the needle is shown on the scale of a voltmeter. The least count of the voltmeter and the reading shown by it respectively are :

(a) 0.15 V and 1.6 V
(b) 0.05 V and 1.6 V
(c) 0.15 V and 1.8 V
(d) 0.05 V and 1.8 V

Previously asked in: 2023 31/1/1 Q15

◆ **Electricity** Least count and reading of a voltmeter

Q31. § 11.6.1 Resistors in Series § 11.6.2 Resistors in Parallel **[2]**

Use Ohm's law to determine the potential difference across the 3 Ω resistor in the circuit shown in the following diagram when key is closed :

Previously asked in: 2024 31/2/1 Q25

◆ **Electricity** Ohm's Law – application to resistor circuits Potential difference across a resistor in a series/parallel circuit

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Q32. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS § 11.6.2 Resistors in Parallel **[3]**

Answer the following:

(a) Three resistors R1, R2 and R3 are connected in parallel and the combination is connected to a battery, an ammeter, a voltmeter and a key. Draw suitable circuit diagram to show the arrangement of these circuit components along with the direction of current flowing.

(b) Calculate the equivalent resistance of the following network :

Previously asked in: 2022 31/1/1 Q11

◆ **Electricity** Equivalent resistance of a resistor network Parallel combination of resistors – circuit diagram with ammeter, voltmeter and key

Q33. § 11.7 HEATING EFFECT OF ELECTRIC CURRENT § 11.8 ELECTRIC POWER **[1]**

In a resistive circuit if the current is increased to two times, the percentage change in the amount of heat dissipated in the circuit would be :

(a) 400%
(b) 300%
(c) 200%
(d) 100%

Previously asked in: 2023 31/2/1 Q15

◆ **Electricity** Heating Effect of Electric Current (Joule's Law)

Q34. § 11.7 HEATING EFFECT OF ELECTRIC CURRENT **[1]**

The resistance of a resistor is reduced to half of its initial value. If other parameters of the electrical circuit remain unaltered, the amount of heat produced in the resistor will become :

(a) four times
(b) two times
(c) half
(d) one fourth

Previously asked in: 2023 31/4/1 Q15

◆ **Electricity** Heating Effect of Electric Current – Effect of Changing Resistance on Heat Produced (Joule's Law)

Q35. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS § 11.6.1 Resistors in Series **[5]**

(i) How many bulbs of resistance 8 Ω each should be connected in parallel combination to draw a current of 2 A from a battery of 4 V ?
(ii) Name the device used for measuring electric current. How is it connected in a circuit ?
(iii) State Joule's law of heating.

Previously asked in: 2026 31/1/1 Q39(b)

◆ **Electricity** Ammeter and its connection in a circuit Joule's law of heating Resistors in parallel combination

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Q36. § Chapter Introduction § 11.7 HEATING EFFECT OF ELECTRIC CURRENT § 11.7.1 Practical Applications of Heating Effect of Electric Current **[4]**

> When electric current flows in a purely resistive circuit electrical energy gets fully converted into heat energy. The amount of heat produced (H) in the circuit is found to be directly proportional to (i) the square of current (I^2) (ii) the resistance (R) of the conductor and (iii) the time (t) for which current flows. In other words $H = I^2Rt$. Electrical devices such an electric fuse, electric heater, electric iron etc. are all based on this effect called heating effect of electric current.

Read the source and answer the sub-parts that follow.

(a) List two properties of heating elements. [1]

(b) List two properties of electric fuse. [1]

(c) Name the principle on which an electric fuse works. Explain how a fuse wire is capable of saving electrical appliances from getting damaged due to accidently produced high currents. [2]

Previously asked in: 2024 31/2/1 Q39

◆ **Electricity** Electric Fuse – Principle and Working Heating Effect of Electric Current – Joule's Law Properties of Heating Elements

Q37. § 11.7 HEATING EFFECT OF ELECTRIC CURRENT § 11.7.1 Practical Applications of Heating Effect of Electric Current § 11.8 ELECTRIC POWER **[1]**

An electric iron of resistance 20 Ω draws a current of 5 A. The heat developed in the iron in 30 seconds is :

A 15000 J
B 6000 J
C 1500 J
D 3000 J

Previously asked in: 2024 31/4/1 Q14

◆ **Electricity** Heating Effect of Electric Current – Joule's Law ($H = I^2Rt$)

Q38. § 11.8 ELECTRIC POWER **[2]**

An electric source can supply a charge of 500 coulomb. If the current drawn by a device is 25 mA, find the time in which the electric source will be discharged completely.

Previously asked in: 2024 31/5/1 Q26

◆ **Electricity** Relationship between charge, current and time ($Q = I \times t$)

Q39. § Chapter Introduction § 11.7 HEATING EFFECT OF ELECTRIC CURRENT § 11.8 ELECTRIC POWER **[2]**

Answer the following on Joule's heating and electric energy / resistance.

(A) State two applications of Joule's heating in domestic electric circuit.

(B) Establish the relationship between the commercial unit of electric energy and the SI unit of electric energy.

Previously asked in: 2025 31/5/1 Q25

◆ **Electricity** Applications of Joule's Heating Effect Commercial Unit of Electric Energy and its relation to SI unit (kWh to Joule)

Q40. § 11.8 ELECTRIC POWER **[2]**

Define electric power. When do we say that the power consumed in an electric circuit is 1 watt ?

Previously asked in: 2025 31/1/1 Q25(b)

◆ **Electricity** Electric Power – Definition and Unit (Watt)

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Q41. § 11.8 ELECTRIC POWER **[3]**

Answer the following:

(a) What is the meaning of electric power of an electrical device ? Write its SI unit. (1½)

(b) An electric kettle of 2kW is used for 2h. Calculate the energy consumed in (i) kilowatt hour and (ii) joules. (1½)

Previously asked in: 2022 31/2/1 Q12 (OR-2)

◆ **Electricity** | Electric Power – definition and SI unit | Electrical Energy consumption – calculation in kWh and joules

Q42. § Chapter Introduction | § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS **[4]**

> In our homes, we receive the supply of electric power through a main supply also called mains, either supported through overhead electric poles or by underground cables. In our country the potential difference between the two wires (live wire and neutral wire) of this supply is 220 V.

Read the passage carefully and answer the questions that follow.

(a) Write the colours of the insulation covers of the line wires through which supply comes to our homes. [1]

(b) What should be the current rating of the electric circuit (220 V) so that an electric iron of 1 kW power rating can be operated ? [1]

(c) Answer the following : [2]

Previously asked in: 2025 31/1/1 Q39

◆ **Electricity** | Domestic Electric Circuits – Live, Neutral and Earth Wires | Electric Power and Current Rating Calculation | Household Electric Supply – Mains, Potential Difference and Safety

Q43. § 11.8 ELECTRIC POWER **[3]**

An electric motor rated 1100 W is connected to 220 V mains. Find : (i) The current drawn from the mains, (ii) Electric energy consumed if the motor is used for 5 hours daily for 6 days. (iii) Total cost of energy consumed if the rate of one unit is ₹ 5.

Previously asked in: 2022 31/4/1 Q13 (main)

◆ **Electricity** | Cost of Electrical Energy | Electric Power and Current Calculation (P = VI) | Electrical Energy Consumption and Units (kWh)

Q44. § 11.8 ELECTRIC POWER **[2]**

An electric heater is rated 220 V; 11 A. Calculate the power consumed if the heater is operated at 200 V.

Previously asked in: 2026 31/1/1 Q34(b)

◆ **Electricity** | Electric Power ($P = V^2/R$)

Q45. § Chapter Introduction | § 11.1 ELECTRIC CURRENT AND CIRCUIT | § 11.7.1 Practical Applications of Heating Effect of Electric Current **[1]**

An electric bulb is connected to a power supply of 220 V. If the current drawn by the bulb from the supply is 500 mA, the power of the bulb is :

(A) 11 W
(B) 110 W
(C) 220 W
(D) 1100 W

Previously asked in: 2025 31/2/1 Q14

◆ **Electricity** | Electric Power (P = VI)

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Q46. § 11.8 ELECTRIC POWER **[2]**

In the given circuit calculate the power consumed in watts in the resistor of 2 Ω :

Previously asked in: 2024 31/1/1 Q25(B)

◆ **Electricity** Power consumed in a resistor (P = I²R / V²/R)

Q47. § Chapter Introduction § 11.8 ELECTRIC POWER **[5]**

Answer the following about electric power :

(i) Define electric power. Express it in terms of potential difference (V) and resistance (R).

(ii) An electric oven is designed to work on the mains voltage of 220 V. This oven consumes 11 units of electrical energy in 5 hours. Calculate : (a) power rating of the oven (b) current drawn by the oven (c) resistance of the oven when it is red hot

Previously asked in: 2024 31/1/1 Q36(A)

◆ **Electricity** Electric Power – definition and formula (P = V²/R) Electrical Energy and Power rating calculations

Q48. § Chapter Introduction § 11.7.1 Practical Applications of Heating Effect of Electric Current **[2]**

An electric kettle is rated 750 W; 220 V. Can this kettle be used in a circuit which has a fuse of current rating 3 A ? Give reason for your answer.

Previously asked in: 2025 31/2/1 Q26

◆ **Electricity** Fuse and Safety in Electric Circuits Power, Voltage, and Current Calculation (P = VI)

Q49. § 11.3 CIRCUIT DIAGRAM **[1]**

The expressions that relate (i) Q, I and t and (ii) Q, V and W respectively are (Here the symbols have their usual meanings) :

(a) (i) I = Q/t (ii) W = V/Q
(b) (i) Q = I × t (ii) W = V × Q
(c) (i) Q = I/t (ii) V = W/Q
(d) (i) I = Q/t (ii) Q = V/W

Previously asked in: 2023 31/5/1 Q13

◆ **Electricity** Relation between electric charge (Q), current (I) and time (t): Q = I × t
Relation between electric charge (Q), potential difference (V) and work done (W): V = W/Q

Q50. § Chapter Introduction **[3]**

Explain in brief the function of an electric fuse in a domestic circuit. An electric heater of current rating 3 kW; 220 V is to be operated in an electric circuit of rating 5 A. What is likely to happen when the heater is switched 'ON' ? Justify your answer with necessary calculation.

Previously asked in: 2024 31/3/1 Q32

◆ **Electricity** Electric Fuse – Function in Domestic Circuit Power, Current and Voltage Calculations in Electric Circuits

Q51. § Chapter Introduction § 11.7.1 Practical Applications of Heating Effect of Electric Current **[3]**

The electrical resistivity of three materials A, B and C at 20°C is given below :

(i) Classify these materials as conductor, alloy and insulator.

(ii) Give one example of each of these materials and state one use of each material in the design of an electrical appliance say an electric stove or an electric iron.

Previously asked in: 2025 31/4/1 Q32

◆ **Electricity** Conductors, Alloys and Insulators – Classification and Uses Electrical Resistivity of Materials

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Q52. § 11.4 OHM'S LAW § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[5]**

Option (A):

(i) The given electric circuit is a part of an electrical device. Use the information given in the electric circuit diagram to calculate : (I) Potential difference across the ends of resistor R2. (II) Value of resistor R2. (III) Value of resistor R1.

(ii) Write the factors on which resistance of a conductor depends and derive the formula for resistance of a given conductor.

Previously asked in: 2026 31/4/1 Q39 (A)

◆ **Electricity** Factors affecting resistance and resistivity formula (R = ρl/A) Ohm's law and circuit calculations (V, I, R)

Q53. § 11.7.1 Practical Applications of Heating Effect of Electric Current § 11.8 ELECTRIC POWER **[5]**

Option (B):

(i) How much electric current will an electric iron draw from 220 V source if the resistance of its heating element when hot, is 55 Ω ? Calculate the power consumed by the electric iron when it is operated at 220 V.

(ii) In a house, 3 bulbs of 100 watt each, are lit for 5 hours daily and an electric heater of 1.0 kW is used for half an hour daily. Calculate the total energy consumed in a month of 30 days and its cost at the rate of ₹ 3.60 per kWh.

(iii) With reason explain, why are alloys commonly used to make elements of electrical heating devices.

Previously asked in: 2026 31/4/1 Q39 (B)

◆ **Electricity** Electric power (P = VI / V^2/R) Electrical energy and cost calculation (kWh) Heating effect of electric current and use of alloys Ohm's law and current calculation

Q54. § 11.4 OHM'S LAW § 11.6.1 Resistors in Series § 11.6.2 Resistors in Parallel **[3]**

The values of current I flowing in a given resistor for the corresponding values of potential difference V applied across the ends of resistor are given below in the table :

Plot a graph between V and I and calculate the resistance of that resistor.

Previously asked in: 2026 31/2/1 Q37

◆ **Electricity** Ohm's Law – V-I graph and calculation of resistance

Q55. § 11.6.1 Resistors in Series **[5]**

Answer the following parts:

(i) The potential difference across the two ends of a circuit component is decreased to one-third of its initial value, while its resistance remains constant. What change will be observed in the current flowing through it ? Name and state the law which helps us to answer this question. [2]

(ii) Draw a schematic diagram of a circuit consisting of a battery of four 1·5 V cells, a 5 Ω resistor, a 10 Ω resistor and a 15 Ω resistor and a plug key, all connected in series. Now find (I) the electric current passing through the circuit, and (II) potential difference across the 10 Ω resistor when the plug key is closed. [3]

Previously asked in: 2024 31/5/1 Q36 (a)

◆ **Electricity** Ohm's Law – relationship between potential difference, current, and resistance Series combination of resistors – total resistance and current

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Q56. § 11.4 OHM'S LAW § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS § 11.6.1 Resistors in Series **[2]**

Let the resistance of an electrical device remain constant, while the potential difference across its two ends decreases to one fourth of its initial value. What change will occur in the current through it ? State the law which helps us in solving the above stated question.

Previously asked in: 2023 31/6/1 Q24

◆ **Electricity** Ohm's Law and effect of changing potential difference on current

Q57. § 11.4 OHM'S LAW § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[2]**

V–I graph for two conducting wires A and B are as shown. If both wires are of the same length and same diameter, which of the two is made of a material of high resistivity ? Give reasons to justify your answer.

Previously asked in: 2023 31/2/1 Q25

◆ **Electricity** V–I graph and resistivity of conducting wires

Q58. § Chapter Introduction § 11.2 ELECTRIC POTENTIAL AND POTENTIAL DIFFERENCE § 11.7 HEATING EFFECT OF ELECTRIC CURRENT **[3]**

Answer the following :

(a) Name a device which is used to : (i) Maintain a constant potential difference in a circuit. (ii) Change the electric current in an electric circuit.

(b) When the potential difference between the terminals of an electric heater is 110 V, a current of 5 A flows through it. What will be the value of current flowing through it when the potential difference is increased to 220 V ?

Previously asked in: 2026 31/3/1 Q36

◆ **Electricity** Devices maintaining constant potential difference (battery/cell) and varying current (rheostat/variable resistor) Ohm's Law — calculating current from potential difference and resistance

Q59. § 11.4 OHM'S LAW § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS § 11.6.2 Resistors in Parallel **[3]**

Consider the given electric circuit :
Calculate the following :

(a) Total resistance of the circuit [1]

(b) The electric current drawn from the battery [1]

(c) Potential difference between points P and Q [1]

Previously asked in: 2026 31/3/1 Q37

◆ **Electricity** Ohm's Law – Current drawn from battery Potential Difference across circuit elements Series and Parallel Combination of Resistors

Q60. § 11.2 ELECTRIC POTENTIAL AND POTENTIAL DIFFERENCE § 11.3 CIRCUIT DIAGRAM § 11.4 OHM'S LAW **[3]**

Answer the following about electricity.

(a) Explain the statement "Potential difference between two points is 1 volt".

(b) What do the symbols given below represent in an electric circuit ? Write one function of each.

Previously asked in: 2025 31/6/1 Q33

◆ **Electricity** Circuit symbols and their functions Electric Potential Difference – definition and unit (volt)

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Q61. § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[3]**

Answer the following:

(a) State Ohm's Law. Represent it mathematically.

(b) Define 1 ohm.

(c) What is the resistance of a conductor through which a current of 0.5 A flows when a potential difference of 2 V is applied across its ends ?

Previously asked in: 2022 31/2/1 Q11

◆ **Electricity** Definition of 1 ohm Numerical application of Ohm's Law (R = V/I) Ohm's Law – statement and mathematical representation

Q62. § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS **[3]**

Answer the following:

(a) List the factors on which the resistance of a uniform cylindrical conductor of a given material depends. (2+1)

(b) The resistance of a wire of 0.01 cm radius is 10 Ω. If the resistivity of the wire is 50×10^{-8} Ω m, find the length of this wire.

Previously asked in: 2022 31/2/1 Q12 (OR-1)

◆ **Electricity** Factors affecting resistance of a conductor Resistivity and calculation of length using R = ρL/A

Q63. § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[3]**
§ 11.7.1 Practical Applications of Heating Effect of Electric Current

Answer the following :

(a) Write the relationship between resistivity and resistance of a cylindrical conductor of length l and area of cross-section A. Hence derive the SI unit of resistivity. [2]

(b) Why are alloys used in electrical heating devices ? [1]

Previously asked in: 2025 31/1/1 Q33

◆ **Electricity** Alloys in electrical heating devices Resistivity and Resistance – relationship and SI unit derivation

Q64. § 11.7.1 Practical Applications of Heating Effect of Electric Current **[1]**

Which of the following is a poor conductor of electricity ?

A Pb
B Cu
C Ag
D Al

Previously asked in: 2026 31/1/1 Q21

◆ **Electricity** Conductors, Alloys and Insulators – Classification and Uses Electrical Resistivity of Materials

Q65. § 11.6.1 Resistors in Series § 11.6.2 Resistors in Parallel **[3]**

Study the following circuit and find : (i) Effective resistance of the circuit (ii) Current drawn from the battery (iii) Potential difference across the 5 Ω resistor

Previously asked in: 2022 31/4/1 Q13 (OR)

◆ **Electricity** Current drawn from a battery using Ohm's Law Effective/Equivalent Resistance of a Circuit (Series and Parallel Combinations) Potential Difference across a resistor in a circuit

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Q66. § Chapter Introduction § 11.1 ELECTRIC CURRENT AND CIRCUIT **[3]**

(A) (i) Why is an alternating current (A.C.) considered to be advantageous over direct current (D.C.) for the long distance transmission of electric power ?
(ii) How is the type of current used in household supply different from the one given by a battery of dry cells ?
(iii) How does an electric fuse prevent the electric circuit and the appliances from a possible damage due to short circuiting or overloading.

Previously asked in: 2023 31/4/1 Q32 (A)

◆ **Electricity** AC household supply vs DC from dry cell battery
Alternating Current (AC) vs Direct Current (DC) – advantages of AC for long distance transmission
Electric fuse – working principle and role in preventing damage due to short circuit and overloading

Q67. § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[2]**

The resistance of a wire of 0.01 cm radius and 1.0 cm length is 7 Ω. Calculate its resistivity.

Previously asked in: 2026 31/1/1 Q34(a)

◆ **Electricity** Resistivity and factors affecting resistance

Q68. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS § 11.6.1 Resistors in Series § 11.6.2 Resistors in Parallel **[5]**

Answer the following:

(i) How is electric current related to the potential difference across the terminals of a conductor ? Draw a labelled circuit diagram to verify this relationship.

(ii) Why should an ammeter have low resistance ?

(iii) Two V - I graphs A and B for series and parallel combinations of two resistors are as shown. Giving reason state which graph shows (a) series, (b) parallel combination of the resistors.

Previously asked in: 2023 31/4/1 Q36

◆ **Electricity** Ammeter – low resistance and its significance Circuit diagram to verify Ohm's Law
Ohm's Law – relationship between electric current and potential difference V-I graphs for series and parallel combinations of resistors

Q69. § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[5]**

(i) Due to change in length and area of cross-section of a conductor, resistance of conductor changes while resistivity does not change. Why ?
(ii) Conductors of electric toasters and electric iron are made of an alloy rather than a pure metal. Why ?
(iii) Define the S.I. unit of electric current.

Previously asked in: 2026 31/1/1 Q39(a)

◆ **Electricity** Resistance and Resistivity (factors affecting resistance) SI unit of electric current (Ampere)

Q70. § 11.7.1 Practical Applications of Heating Effect of Electric Current **[1]**

Assertion (A) : Nichrome is an alloy which is commonly used in electrical heating devices such as electric irons, toasters, etc.
Reason (R) : The resistivity of nichrome is high and its resistance decreases with increase in temperature.

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(C) Assertion (A) is true, but Reason (R) is false.
(D) Assertion (A) is false, but Reason (R) is true.

Previously asked in: 2025 31/2/1 Q19

◆ **Electricity** Resistivity and its dependence on temperature – Nichrome as heating element

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Q71. § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS **[5]**

Answer the following about electrical resistivity :

(i) Write the relation between resistance R and electrical resistivity ρ of the material of a conductor in the shape of cylinder of length l and area of cross-section A. Hence derive the SI unit of electrical resistivity.

(ii) The resistance of a metal wire of length 3 m is 60 Ω. If the area of cross-section of the wire is 4×10^{-7} m^2, calculate the electrical resistivity of the wire.

(iii) State how would electrical resistivity be affected if the wire (of part 'ii') is stretched so that its length is doubled. Justify your answer.

Previously asked in: 2024 31/1/1 Q36(B)

◆ **Electricity** | Effect of stretching a wire on electrical resistivity | Electrical Resistivity – formula, SI unit derivation | Numerical calculation of electrical resistivity using ρ = RA/l

Q72. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS | § 11.6.2 Resistors in Parallel **[1]**

Study the I-V graph for three resistors of resistances R_1, R_2 and R_3 and select the correct statement from the following :

(A) $R_1 = R_2 = R_3$
(B) $R_1 > R_2 > R_3$
(C) $R_3 > R_2 > R_1$
(D) $R_2 > R_3 > R_1$

Previously asked in: 2024 31/2/1 Q15

◆ **Electricity** | I-V graph and comparison of resistances

Q73. § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS **[1]**

A wire of length 'l' is gradually stretched so that its length increases to 3l. If its original resistance is R, then its new resistance will be :

(A) 3R
(B) 6R
(C) 9R
(D) 27R

Previously asked in: 2025 31/3/1 Q13

◆ **Electricity** | Resistance and its dependence on length and cross-sectional area (stretching of wire)

Q74. § 11.8 ELECTRIC POWER **[5]**

Answer the following :

(a) State Ohm's law.

(b) Name and define the physical quantity determined by the slope of V–I curve given in the diagram. Use this graph to find the value of this physical quantity in SI units.

(c) Establish the relationship between 1 kWh and 1 joule.

Previously asked in: 2023 31/5/1 Q36

◆ **Electricity** | Ohm's Law | Relationship between kWh and Joule (Electrical Energy) | Resistance from V–I graph (slope of V–I curve)

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Q75. § 11.4 OHM'S LAW § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[1]**

In case of four wires of same material, the resistance will be minimum if the diameter and length of the wire respectively are

A D/2 and L/4
B D/4 and 4L
C 2D and L
D 4D and 2L

Previously asked in: 2024 31/3/1 Q14

◆ **Electricity** Factors affecting resistance – length and cross-sectional area (diameter)

Q76. § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[2]**

Two wires A and B of same material, having same lengths and diameters 0·2 mm and 0·3 mm respectively, are connected one by one in a circuit. Which one of these two wires will offer more resistance to the flow of current in the circuit ? Justify your answer.

Previously asked in: 2024 31/4/1 Q26

◆ **Electricity** Resistance and its dependence on cross-sectional area (diameter) of a conductor

Q77. § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS **[4]**

> Three students Shweta, Ayesha and Samridhi were performing an experiment to understand the factors on which the resistance of a conductor depends. Each one of them completed electric circuit with the help of a cell, an ammeter, a plug key and wire.
>
> Shweta put nichrome wire of length 'l' in the circuit and after plugging the key, noted current in the ammeter.
> Ayesha put nichrome wire of same thickness but twice the length i.e. '2l' in the circuit and after plugging the key, noted current in the ammeter.
> Samridhi took copper wire of length 'l' and same thickness in the circuit and after plugging the key, noted current in the ammeter.

Answer the following questions based on the passage:

(a) If the ammeter reading is X ampere with nichrome wire of length 'l', then what will be the ammeter reading if the length of nichrome wire is doubled with same area of cross-section ? [1]

(b) What happens to the ammeter reading if the area of cross-section of nichrome wire is doubled, keeping the length of wire 'l' the same ? [1]

(c) Define 'resistivity'. Write its SI unit. Compare the resistivity of an alloy with its constituents metals. [2]

Previously asked in: 2026 31/5/1 Q38

◆ **Electricity** Factors affecting resistance of a conductor (length and area of cross-section)
Resistivity — definition, SI unit, and comparison with constituent metals

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Q78. § 11.7 HEATING EFFECT OF ELECTRIC CURRENT **[4]**

> Swati, a class 10 student, observes that when she passes close to the refrigerator in her kitchen, she feels the heat, although the things kept inside the refrigerator are cool.

Read the following passage and answer the questions that follow :

(a) Describe the cause of heating in the above-mentioned case. [1]

(b) A current I flows through a resistor of resistance R when the potential difference across it is V. Applying Ohm's law, write the formula for amount of heat produced by the resistor in time t. [1]

(c) Answer (i) or (ii): [2]

Previously asked in: 2026 31/2/1 Q38

◆ **Electricity** | Heating Effect of Electric Current | Joule's Law of Heating – Formula Derivation using Ohm's Law

Q79. § Chapter Introduction | § 11.7.1 Practical Applications of Heating Effect of Electric Current | § 11.8 ELECTRIC POWER **[5]**

Answer the following:

(a) An electric iron consumes energy at a rate of 880 W when heating is at the maximum rate and 330 W when the heating is at the minimum. If the source voltage is 220 V, calculate the current and resistance in each case.

(b) What is heating effect of electric current ?

(c) Find an expression for the amount of heat produced when a current passes through a resistor for some time.

Previously asked in: 2023 31/1/1 Q36

◆ **Electricity** | Heating Effect of Electric Current (Joule's Heating) | Joule's Law of Heating – derivation of $H = I^2Rt$ | Power, Current and Resistance calculations ($P = VI$, $I = P/V$, $R = V/I$)

Q80. § 11.5 FACTORS ON WHICH THE RESISTANCE OF A CONDUCTOR DEPENDS **[5]**

Answer the following:

(i) What is meant by resistance of a conductor ? Define its SI unit.

(ii) List two factors on which the resistance of a rectangular conductor depends.

(iii) How will the resistance of a wire be affected if its (1) length is doubled, and (2) radius is also doubled ? Give justification for your answer.

Previously asked in: 2023 31/6/1 Q36(a)

◆ **Electricity** | Effect of doubling length and radius on resistance ($R = \rho l/A$) | Factors affecting resistance of a conductor (length, cross-sectional area, material) | Resistance of a conductor and its SI unit (Ohm)

Q81. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS | § 11.6.1 Resistors in Series | § 11.7.1 Practical Applications of Heating Effect of Electric Current **[5]**

In an electric circuit three bulbs of 100 W each are connected in series to a source. In another circuit set of three bulbs of the same wattage are connected in parallel to the same source.

(i) Will the bulb in the two circuits glow with the same brightness ? Justify your answer.

(ii) Now, let one bulb in both the circuits get fused. Will the rest of the bulbs continue to glow in each circuit ? Give reason for your answer.

Previously asked in: 2023 31/6/1 Q36(b)

◆ **Electricity** | Effect of fusing of one bulb on rest of the circuit in series and parallel connections | Series and Parallel Circuits – comparison of brightness and power dissipation

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Q82. § Chapter Introduction § 11.7 HEATING EFFECT OF ELECTRIC CURRENT **[3]**

Answer the following:

(a) A student wants to use an electric heater, an electric bulb and an electric fan simultaneously. How should these gadgets be connected with the mains ? Justify your answer giving three reasons.

(b) What is an electric fuse ? How is it connected in a circuit ?

Previously asked in: 2022 31/4/1 Q12

◆ **Electricity** Electric fuse – definition and circuit connection Parallel combination of electrical appliances

Q83. § Chapter Introduction § 11.7.1 Practical Applications of Heating Effect of Electric Current **[1]**

An electric kettle consumes 1 kW of electric power when operated at 220 V. The minimum rating of the fuse wire to be used for it is

(a) 1 A
(b) 2 A
(c) 4 A
(d) 5 A

Previously asked in: 2023 31/5/1 Q15

◆ **Electricity** Electric Power and Fuse Rating (P = VI)

Q84. § Chapter Introduction § 11.7.1 Practical Applications of Heating Effect of Electric Current § 11.8 ELECTRIC POWER **[2]**

An electric kettle is rated 230 V; 1000 W. Calculate the resistance of its heating element when in operation.

Previously asked in: 2025 31/3/1 Q26

◆ **Electricity** Electrical Power and Resistance Calculation ($P = V^2/R$)

Q85. § 11.8 ELECTRIC POWER **[3]**

Answer the following:

(i) Define Electric Power and write its SI unit. [1]

(ii) Two bulbs rated 100 W; 220 V and 60 W; 220 V are connected in parallel to an electric mains of 220 V. Find the current drawn by the bulbs from the mains. [2]

Previously asked in: 2022 31/1/1 Q12 (a)

◆ **Electricity** Electric Power – definition and SI unit Parallel combination of bulbs – current drawn from mains

Q86. § 11.7 HEATING EFFECT OF ELECTRIC CURRENT § 11.8 ELECTRIC POWER **[3]**

Answer the following:

(i) State Joule's law of heating. Express it mathematically for the situation in which an appliance of resistance R is connected to a source of voltage V and the current I flows through the appliance for a time t.

(ii) A 5 Ω resistor is connected across a battery of 6 volts. Calculate the energy that dissipates as heat in 10 s.

Previously asked in: 2022 31/1/1 Q12 (b)

◆ **Electricity** Heat Dissipated in a Resistor – Numerical Joule's law of heating

Q87. § 11.8 ELECTRIC POWER **[2]**

An electric heater rated 1100 W operates at 220 V. Calculate (i) its resistance, and (ii) the current drawn by it.

Previously asked in: 2022 31/3/1 Q4(a)

◆ **Electricity** Electric Power and Rated Wattage Ohm's Law and Resistance Calculation

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Q88. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS **[1]**

A piece of wire of resistance 'R' is cut lengthwise into three identical parts. These parts are then connected in parallel. If the equivalent resistance of this combination is R′, then the value of R/R′ is :

(a) 1/9
(b) 1/3
(c) 3
(d) 9

Previously asked in: 2025 31/4/1 Q12

◆ **Electricity** Resistance of a wire cut lengthwise and connected in parallel

Q89. § 11.7.1 Practical Applications of Heating Effect of Electric Current **[1]**

An electric bulb is rated 220 V; 11W. The resistance of its filament when it glows with a power supply of 220 V is :

(a) 4400 Ω
(b) 440 Ω
(c) 400 Ω
(d) 20 Ω

Previously asked in: 2025 31/4/1 Q13

◆ **Electricity** Electric Power and Resistance Calculation (P = V²/R)

Q90. § 11.6.2 Resistors in Parallel **[1]**

The minimum number of identical bulbs of rating 4V; 6W, that can work safely with desired brightness, when connected in series with a 240 V mains supply is :

(a) 20
(b) 40
(c) 60
(d) 80

Previously asked in: 2025 31/4/1 Q14

◆ **Electricity** Series combination of bulbs and voltage distribution

Q91. § 11.6 RESISTANCE OF A SYSTEM OF RESISTORS § 11.6.1 Resistors in Series § 11.6.2 Resistors in Parallel **[4]**

> In a domestic circuit five LED bulbs are arranged as shown. The source voltage is 220 V and the power rating of each bulb is marked in the circuit diagram.

In a domestic circuit five LED bulbs are arranged as shown. The source voltage is 220 V and the power rating of each bulb is marked in the circuit diagram. Based on the following circuit diagram, answer the following questions :

(a) State what happens when (i) key K_1 is closed. (ii) key K_2 is closed. [1]

(b) Find the current drawn by the bulb B when it glows. [1]

(c) Calculate (i) the resistance of bulb B, and (ii) total resistance of the combination of four bulbs B, C, D and E. [2]

Previously asked in: 2024 31/3/1 Q39

◆ **Electricity** Domestic electric circuit and parallel combination of bulbs Electric power and current calculation (P = VI, I = P/V) Resistance calculation using P = V²/R and equivalent resistance of parallel combination

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