



## PHYSICS

# BOOKS - SANTRA PHYSICS (BENGALI ENGLISH)

## CURRENT ELECTRICITY

### Numerical Examples

1. The amount of charge present in a charged body is  $3.2 \times 10^{-17} C$ . If the charge of an

electron be  $e = -1.6 \times 10^{-19}C$ , then calculate the number of deficit of electrons in that body.



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2. Calculate the force of repulsion acting between two positive charges of magnitude 20 esu and 30 esu when they are kept at a distance of 2 cm in air.



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3. If 50 coulomb charge flows through a conductor in 10 second, then find the strength of current through the conductor.



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4. If a current of 3 A flows through a conductor for 10 minutes, then calculate the amount of charges that flows through the conductor in that time.



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5. If the potential difference between the two ends of a conductor is 15 volt for which current flowing through it is 3A, then find the resistance of the conductor.



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6. If the resistance of a conductor is  $5\Omega$  and strength of current through it be 2A, find the terminal potential difference between the two ends of the conductor.





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7. Resistance of a conductor is twice that of another conductor and the potential differences between the two ends of the two conductors are same. Find the ratio of strengths of currents flowing through them.



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8. Two wires made of same material have equal length and radius of one of them is twice that

of the other. Find the ratio of their resistances.



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9. Resistance of a copper wire of cross sectional area  $0.02\text{cm}^2$  is  $5\Omega$ . If the resistivity of copper be  $1.72 \times 10^{-6}\Omega\text{-cm}$  then find the length of the wire.



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**10.** Keeping the temperature and diameter constant the length of a wire is made thrice.

What change in the resistance of the wire will be seen ?



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**11.** If a conducting wire is stretched to make itself twice longer then what change in the resistance of the wire will be seen if its resistivity and volume remain unchanged ?





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**12.** Resistances of two coils of wire are  $3\Omega$  and  $6\Omega$ . If these coils be connected is (i) series and in (ii) parallel combination, then what will be the equivalent resistance in each case ?



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**13.** If a source of electricity having potential difference  $10\text{ V}$  sends  $5\text{ A}$  current through a



circuit for 2 minutes then calculate the amount of work done by the source.



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**14.** If a current of strength 3 A flows through a resistance of  $20\Omega$  for 10 minutes, then calculate the amount of heat produced in the resistance.



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**15.** What is the resistance of the filament of a 220V-60 W bulb ? If the bulb is used in a 110 V line instead of 220 V line, then what amount of power it will consume ?



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**16.** Two resistors of resistance  $5\Omega$  and  $10\Omega$  are connected in parallel with a battery of emf 10 V. Draw the circuit diagram and calculate

the amount of energy expended for 5 minutes in each resistor.



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17. What is be the strength of current through a heater coil if a 220 V-0.5 kWh heater is used in 220 V line ?



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1. If 720 C charge flows through a conductor in 2 minutes, the current-strength through the conductor will be

A. a) 6A

B. b) 12A

C. c) 3A

D. d) 2A

**Answer:**



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2. If a current  $I$  flows through a resistance  $R$  for time  $t$ , then the amount of electrical energy consumed will be

A. a)  $iR^2t$

B. b)  $i^2Rt$

C. c)  $iRT$

D. d)  $i^2R^2t$

**Answer:**



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3. If 4 equal resistances each of magnitude  $10\Omega$  be connected in parallel, then equivalent resistance the combination will be

A. a)  $10\Omega$

B. b)  $40\Omega$

C. c)  $2.5\Omega$

D. d)  $5\Omega$

**Answer:**



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## Very Short Answer Type Questions

1. What is the unit of electric charge ?



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2. What is the unit of electromotive force ?



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3. Write down the practical unit of resistance.





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4. What is the value of the smallest charge present in nature ?



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5. What is the CGS unit of resistivity ?



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**6. Define electric power.**



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**7. Define BOT unit.**



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**8. Mention one characteristics of fuse wire.**



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9. How the direction of rotation of Barlow's wheel can be changed?



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10. What is the SI unit of current ?



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**Fill In The Blanks**

1.  $1 \text{ BOT} = 3.6 \times \text{_____ J}$ .



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2. If length of a conductor increases the resistance \_\_\_\_\_.



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**Short Answer Type Questions**

1. How the resistance of conductor depends on its length and area of cross-section ?



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2. Why the term 220 V-100W is written on an electric bulb ?



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3. Why nichrome wire is used in electric heater ?



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4. Write down Ampere's swimming rule.



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5. Write down Flemming's left hand rule.



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6. Write down the Faraday's laws of electromagnetic induction.



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7. Mention the advantages of AC over DC.



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8. Resistance of a wire of circular cross-section is  $2\Omega$ . If both the length and radius of cross-section of the wire be halved, then what will be the resistance of the wire ?



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## Long Answer Type Questions

1. Why fuse is used in electric lines? ?



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2. State Joule's laws of heating effect of current.



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3. In a school there are 10 electric fans each of 40 W runs for 5 hours a day, 5 electric lamps each of 60 W runs for 3 hour daily. If the cost of each unit of electricity be Rs. 5, then calculate the monthly cost for electricity



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4. Find the equivalent resistance between A and B in the circuit shown in the fig. (a).



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5. If two bulbs of powers 60 W and 40 W be joined in series with 220 V main line, then which bulb will glow brighter and why ?



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