



PHYSICS

BOOKS - X BOARDS

X BOARDS

Section A

1. Mention the between a current carrying conductor and magnetic field for which the

force experienced by this current conductor placed field is largest ?



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2. (a) What is a solar cell ? Draw the labelled diagram of a solar cell.

(b) Name the semi-conductor material which is usually used for making solar cells.

(c) Write the uses of solar cells.



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3. We often observe domestic waste decomposing in the bylanes of residential colonies. Suggest ways to make people realise that the improper disposal of waste is harmful to the environment.



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4. Three resistors of 5Ω , 10Ω and 15Ω are connected in series and the combination is connected to battery of 30 V. 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 10Ω resistance?



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5. Mention the types of mirrors used as (i) rear view mirrors, (ii) shaving mirrors. List two reasons to justify your answers in each case.



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6. An object of height 6 cm is placed perpendicular to the principal axis of a concave axis of a concave lens of focal length 5 cm. Use lens formula to determine the position, size and nature of the image if the distance of the object from the lens is 10 cm.



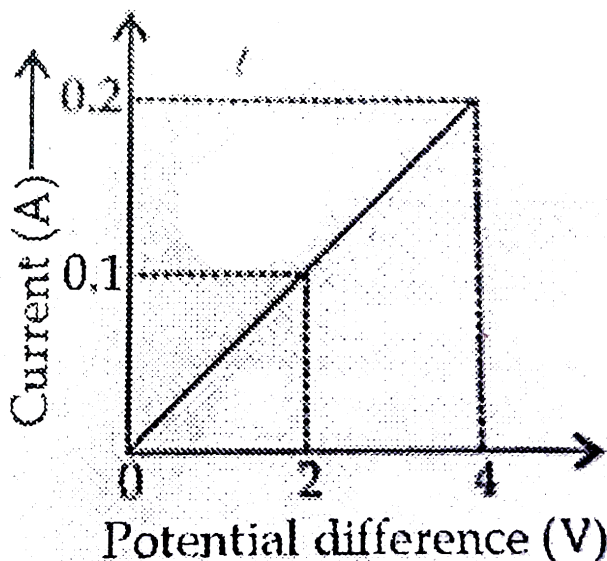
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7. What is the difference in colours of the sun observed during sunrise/sunset and noon?
Give explanation for each.



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8. (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.



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9. (a) Identify A, B and C in the given diagram and write their functions.

(b) Mention the role of gamete and zygote in sexually reproducing organisms.



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10. State the laws of refraction of light. Explain the term 'absolute refractive index of a medium' and write an expression to relate it with the speed of light in vacuum.



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11. Name the physical quantities which are indicated by the direction of thumb and forefinger in the Fleming's right hand rule ?



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12. "A concave mirror of focal length 'f' can form a magnified erect as well as an inverted image of an object placed in front of it. " Justify this statement stating the position of the object with respect to the mirror in each case for obtaining these images.



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13. (i) State Maxwell's right-hand thumb rule.

(ii) PQ is a current carrying conductor in the

plane of the paper as shown in the figure.

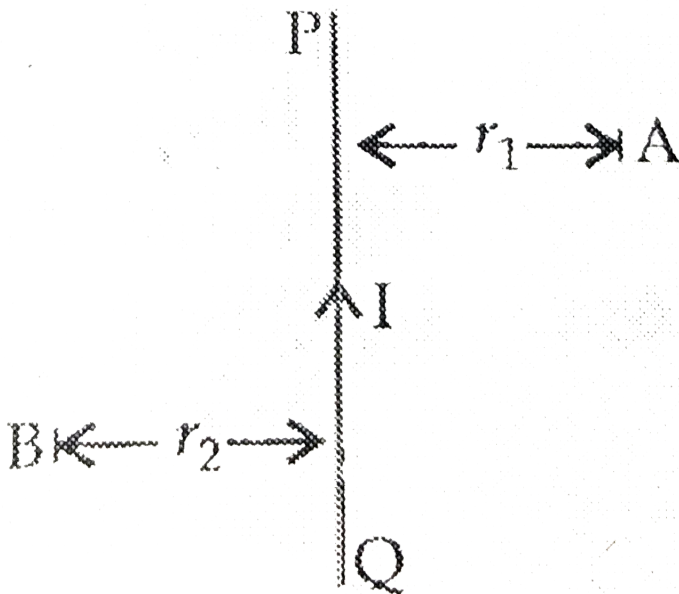
Mention the direction of magnetic fields

produced by it at points A and B. Given

$r_1 < r_2$, where will the strength of the

magnetic field be larger?

Justify your answer in each case.





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14. (a) Shruti draws magnetic field lines close to the axis of a current carrying circular loop. As she moves away from the centre of circular loop, she observes that the lines keep on diverging. Explain the reason for her observation.

(b) Write two properties of magnetic field lines.



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15. Name the type of mirror used (i) by dentists and (ii) in solar furnaces. Give two reasons why such mirrors are used in each case.



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16. When and where do we see a rainbow? How is a rainbow formed? Draw a labelled diagram to illustrate the formation of a rainbow.



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17. (a) Resistors given as R_1 , R_2 and R_3 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 $R_1 = 10\Omega$, $R_2 = 20\Omega$ and $R_3 = 30\Omega$, calculate the effective resistance when they are connected in series to a battery of 6 V. Also find the current flowing in the circuit.



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18. (a) To construct a ray diagram we use two light rays which are so chosen that it is easy to know their directions after reflection. Use these two rays to locate the image of an object placed between infinity and the centre of curvature of a concave mirror.

(b) Draw a ray diagram to show the formation of image of an object placed between the pole and principal focus of a concave mirror. How will the nature and size of the image formed change, if the mirror is replaced by a converging lens of same focal length?



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19. (a) A student cannot see clearly a chart hanging on a wall placed at a distance of 3m from his eyes. Name the defect of vision he is suffering from. Draw a ray diagram to illustrate this defect. List its two possible causes.

(b) Draw a ray diagram to show how this defect may be corrected using a lens of appropriate focal length.

(c) What do you mean by the 'Power of Accommodation' of human eye?



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20. Write any one method to induce in a coil.



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21. Mention any one reason due to which most of the thermal power plants are set up near coal or oil fields.



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22. These resistors of 10Ω , 15Ω and 5Ω are connected in parallel. Find their equivalent resistance.



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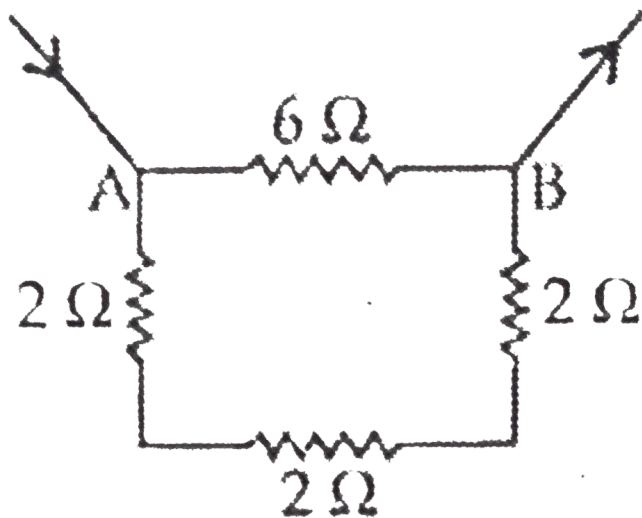
23. (i) Calculate the current through a lamp of 25 W operating at 250 V.

(ii) Why elements of electrical heating devices are made up of alloys?



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24. Find the resistance between point A and B in the circuit diagram given below:





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25. (a) Describe an activity to show with the help of a compass that magnetic field is strongest near poles of a bar magnet.

(b) Mention the direction of magnetic field lines (i) inside a bar magnet and (ii) outside a bar magnet.



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26. Write the basic principle involved for producing electric energy in a nuclear power plant. Write two problems faced by the people living near such nuclear power plants.



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27. A spherical mirror produces an image of magnification -1 on a screen placed at a distance of 50 cm from the mirror.

(a) Write the type of mirror.

(b) Find the distance of the image from the object.

(c) Draw the ray diagram to show the image formation in this case.



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28. Explain giving reason why the sky appears blue to an observer from the surface of the earth? What will the colour of the sky be for an astronaut staying in the international

space station orbiting the earth? Justify your answer giving reason.



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29. (a) Differentiate between AC and DC. Write any two points of difference.

(b) A person operates a microwave oven of 2kW power rating in a domestic circuit of 220 V and current rating 5A. What result is expected? Explain with reason.

(c) Write the frequency of AC and DC.



30. A student want to project the image of a candle flame on the walls of school laboratory by using a lens:

(a) Which type of lens should he use and why?

(b) At what distance in terms of focal length 'F' of the lens should he place the candle flame so as to get (i) a magnified, and (ii) a diminished image respectively on the wall?

(c) Draw ray diagram to show the formation of the image in each case.



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31. Write the relation between electric power (W) of a device with potential difference (Volt) across it and current (amp) flowing through it.



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32. Give two reasons why different electrical appliances in a domestic circuit are connected in parallel.



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33. Explain the effect on the magnetic field produced at a point in a current carrying circular coil due to :

(i) increase in the amount of current flowing through it.

(ii) increase in the distance of point from the coil

(iii) increase in the number of turns of the coil.



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34. An electric lamp and a conductor of resistance 4Ω are connected in series to a 6 V battery. The current drawn by the lamp is 0.25 A. Find the resistance of the electric lamp.



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35. With the help of suitable examples, explain why certain traits cannot be passed on to the next generation. What are such traits called?
or

"A trait may be inherited, but may not be expressed. " Justify this statement with the help of a suitable example.



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36. A student wants to project the image of a candle flame on a screen 60cm in front of a mirror by keeping the flame at a distance of 15 cm from its pole.

(i) Write the type of mirror he should use.

(ii) Find the linear magnification of the image

produced.

(iii) What is the distance between the object and its image ?

(iv) Draw a ray diagram to show the image formation in this case.



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37. A narrow beam PQ of white light is passing through a glass prism ABC as shown in the diagram

(i) Write the name and cause of the

phenomenon observed.

(ii) Where else in nature is this phenomenon observed ?

(iii) Based on this observation, state the conclusion which can be drawn about the constituents of white light.



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38. (a) Two identical resistors each of resistance 10 ohm are connected :

(i) in series.

(ii) in parallel , in terun to a battery of 6V.

Calculate the ratio of power consumed in the combination of resistors in the two cases.

(b) Establish the relationship between 1 kWh and SI unit of energy .



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39. (a) Draw a sectional view of human female reproductive system and label the part where

(i) eggs develop

(ii) fertilisation take place.

(iii) fertilised egg gets implanted.

(b) Describe, in brief, the changes the uterus undergoes

(i) to receive the zygote.

(ii) if zygote is not formed.



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40. (a) Explain the following terms related to spherical lenses :

(i) optical center (ii) centre of curvature.

(iii) principal axis (iv) aperture

(v) principal focus (vi) focal length

(b) A converging lens has focal length of 12 cm.

Calculate at what distance should the object be placed from the lens so that it forms an image at 48 cm on the other side of the lens.

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41. List four characteristics of the images formed by plane mirrors.

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42. State reason for the following :

(i) Lemon is used for restoring the shine of tarnished copper vessels.

(ii) A metal sulphide is converted into its oxide to extract the metal from the sulphide ore.

(iii) Copper wire are used in electrical connections.



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43. The rate of breathing in aquatic organisms is much faster than that seen in terrestrial

organisms. Give reason. State the pathway of air from nostrils to the lungs in human beings.

or

Mention three characteristic features of hormonal secretions in human beings.



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44. A circuit has a line of 5 A. How many lamps of rating 40W, 220V can simultaneously run on this line safely ?



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45. To construct a ray diagram we use two rays of light which are so chosen that it is easy to determine their directions after reflection from the mirror. Choose these two rays and state the path of these rays after reflection from a concave mirror. Use these two rays to find the nature and position of the image of an object placed at a distance of 15 cm from a concave mirror of focal length 10 cm.



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46. (a) Draw magnetic field lines of a bar magnet. "Two magnetic field lines never intersect each other." Why?

(b) An electric oven of 1.5 kW is operated in a domestic circuit (220V) that has a current rating of 5A. What result do you expect in this case? Explain.

or

Which is meant by resistance of a conductor?

Name and define its SI units. List the factors on which the resistance of a conductor

depends. How is the resistance of a wire affected if –

(i) its length is doubled , (ii) its radius is doubled ?



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47. "A convex lens can form a magnified erect as well as magnified inverted image of an object placed in front of it." Draw ray diagram to justify this statement stating the position of the object with respect to the lens in each

case.

An object of height 4 cm is placed at a distance of 20 cm from a concave lens of focal length 10cm. Use lens formula to determine the position of the image formed.



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48. The absolute refractive indices of glass and water are $\frac{3}{2}$ and $\frac{4}{3}$ respectively. If the speed of light is $2 \times 10^8 m/s$, calculate the speed of light in (i) vacuum, (ii) water.



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49. What are magnetic field lines? List two characteristic properties of these lines.



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50. Define 1 ohm resistance.

A student has a resistance wire of 1 ohm. If the length of this wire is 50 cm, to what length he should stretch it uniformly so as to

obtain a wire of 4Ω resistance? Justify

your answer .



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51. If the image formed by a mirror for all positions of the object in front of it is always erect diminished, what type of mirror is it? Draw a ray diagram to justify your answer . Where and why do we generally use this type of mirror?



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52. What is meant by scattering of light ?



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53. (a) Explain feed back mechanism for regulation of hormonal secretion with the help

of one example .

(b) State two different types of movement in plant. Mention two points of difference between them.



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54. Name an instrument that measures potential difference between two points in a circuit.

Define the unit of potential difference in terms of SI unit of charge and work. Draw the circuit symbols for a (i) variable resistor, (ii) a plug key which is closed one.

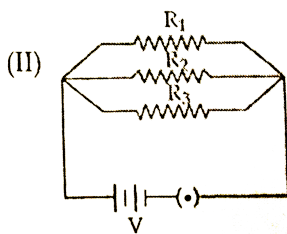
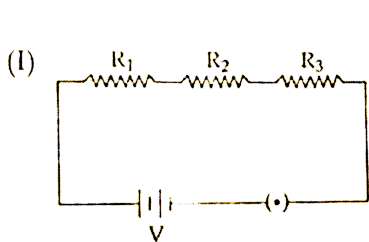
Two electric circuits I and II are shown below.

(i) Which of the two circuits has more resistance?

(ii) Through which circuit more current passes?

(iii) In which circuit, the potential difference across each resistor is equal?

(iv) If $R_1 > R_2 > R_3$, in which circuit more heat will be produced in R_1 as compared to other two resistors?



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55. (a) How do Mendel's experiments show that traits may be dominant or recessive ?

(b) How do Mendel's experiments show that traits are inherited independently ?



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56. What is meant by power of a lens? Define its S.I.unit.

You have two lenses A and B of focal lengths + 10 cm and - 10 respectively. State the

nature and power of each lens. Which of the two lenses will form a virtual and magnified image of an object placed 8 cm from the lens? Draw a ray diagram to justify your answer.



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57. One half of a convex lens of focal length 10 cm is covered with a black paper. Can such a lens produce an image of a complete object placed at a distance of 30 cm from the

lens? Draw a ray diagram to justify your answer. A 4 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 20 cm. The distance of the object from the lens is 15 cm. Find nature, position and size of the image.



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58. State two positions in which a concave mirror produces a magnified image of a given

object. List two difference between the two images.



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59. Which important properties of aluminium are responsible for its great demand in industry?



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60. Draw the pattern of magnetic field lines around a current carrying straight conductor.

How does the strength of the magnetic field produced change.

(i) with the distance from the conductor ?

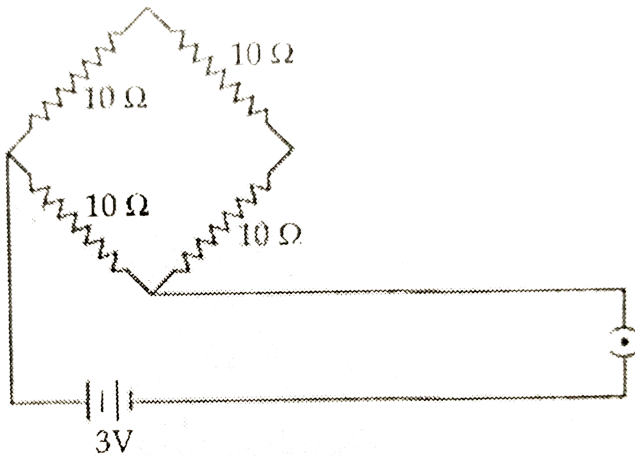
(ii) with increase in current in a conductor ?



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61. Find the current drawn from the battery by the network of four resistors shown in the

figure.

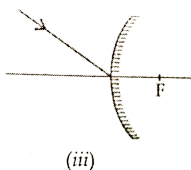
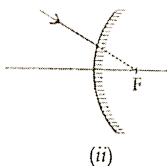
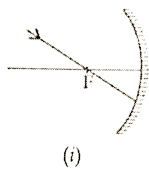


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62. Write the principle of a thermal power plant ? What are disadvantages of installing such power plants ?

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63. Draw the following diagram, in which a ray of light is incident on a concave/convex mirror, on your answer sheet. Show the path of this ray, after reflection, in each case.



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64. Why does the sun appear reddish early in the morning ? Will this phenomenon be

observed by an observe on the moon ? Justify your answer with a reason.



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65. For the series combination of three resistors establish the relation :

$$R = R_1 + R_2 + R_3$$

where the symbols have their usual meanings.

Calculate the equivalent resistance of the combination of three resistors of 6Ω , 9Ω and 18Ω joined in parallel.



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66. What is meant by electric circuit ? Why does electric current start flowing in a circuit the moment circuit is complete ? When do we say that the potential difference across a conductor in a circuit is 1 volt ?

Calculate the potential difference between the two terminals of a battery if 12 joules of work is done in transferring 2 coulombs of charge.



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67. (a) Write the function of each of the following parts of human eye :

cornea, iris, crystalline lens, ciliary muscles

(b) Millions of people of the developing countries of the world are suffering from corneal blindness. These persons can be cured by replacing the defective cornea with the cornea of a donated eye. A charitable society of your city has organised a campaign in your neighbourhood in order to create awareness about this fact. If you are asked to participate in this mission how would you contribute in

this noble cause ?

(i) State the objective of organising such campaigns.

(ii) List two arguments which you would give to motivate the people to donate their eyes after death.

(iii) List two values which are developed in the persons who actively participate and contribute in such programmes.



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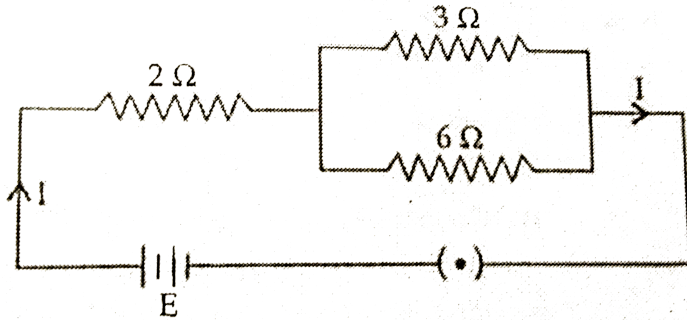
68. Name the type of mirrors used in the design of solar furnaces. Explain how high temperature is achieved by this device.



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69. In the given electric circuit if the current flowing through 3Ω resistor is 1 A, find the voltage of the battery and the current I drawn

from it.



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70. How are the areas of study – evolution and classification – interlinked?



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71. The image of an object formed by a mirror is real, inverted and its magnification -1 . If the image is at a distance of 40 cm from the mirror, where is the object placed ? Where would the image be if the object is moved 20 cm towards the mirror? State reason and also draw ray diagram for the new position of the object to justify your answer.



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72. State Ohm's law. Draw a labelled circuit diagram to verify this law in the laboratory. If you draw a graph between the potential difference and current flowing through a metallic conductor, what kind of curve will you get? Explain how would you use this graph to determine the resistance of the conductor.



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73. A coil of insulated wire is connected to a galvanometer. What would be seen if a bar magnet with its south pole towards one face of the coil is

(i) moved quickly toward it

(ii) moved quickly away from it

(iii) placed near its one face ?

These activities are then repeated with north pole of the magnet. What will be the observations?

(b) Name and define the phenomenon involved in above activities.

(c) Name the rule which can determine the direction of current in each case.



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74. Define evolution. How does it occur ?

Explain how fossils provide evidences in support of evolution ?



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75. It is desired to obtain an erect image of an object, using concave mirror of focal length of 12 cm.

(i) What should be the range of distance of an object placed in front of mirror ?

(ii) Will the image be smaller or large than the object ? Draw a ray diagram to show the formation of image in this case.

(iii) Where will the image of this object be, if it is placed 24 cm in front of the mirror ? Draw a ray diagram for this situation also to justify your answer.

Show the positions of the pole, the principal focus and the centre of curvature in the above ray diagrams.



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76. An object is placed at a distance of 30 cm in front of a convex mirror of focal length 15 cm. Write four characteristics of the image formed by the mirror.



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77. Describe the structure and functioning of nephrons.



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78. Compare and contrast nervous and hormonal mechanisms for control and coordination in animals.



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79. Two lamps, one rated 40 W at 220 V and the other 100 W at 220 V, are connected in parallel to the electric supply at 220V.

(a) Draw a circuit diagram to show the connections.

(b) Calculate the current drawn from the electric supply.

(c) Calculate the total energy consumed by the two lamps together when they operate for one hour.



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80. Two resistors, with resistance 10Ω and 15Ω , are to be connected to a battery of e.m.f. 12 V so as to obtain :

(i) minimum current (ii) maximum current

(a) Describe the mode of connecting the resistances in each case.

(b) Calculate the strength of the total current in the circuit in each case.



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81. A coil of insulate copper wire is connected to a galvanometer. What will happen if a bar magnet is (i) pushed into the coil, (ii) withdrawn from inside the coil, (iii) held stationary inside the coil ?



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82. Due to gradual weakening of ciliary muscles and diminishing flexibility of the eye lens, a certain defect of vision arises. Write the

name of this defect. Name the type of lens required by such persons to improve the vision. Explain the structure and function of such a lens.



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83. (a) To construct a ray diagram, we use two rays which are so chosen that it is easy to know their directions after reflection from the mirror. List two such rays and state the path of these rays after reflection in case of concave

mirrors. Use these two rays and draw ray diagram to locate the image of an object placed between pole and focus of a concave mirror.

(b) A concave mirror produces three times magnified image on a screen. If the object is placed 20 cm in front of the mirror, how far is the screen from the object?



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84. (a) Draw a ray diagram to explain the term angle of deviation.

(b) Why do the component colours of incident white light split into a spectrum while passing through a glass prism, explain.

(c) Draw a labelled ray diagram to show the formation of a rainbow.



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85. State two ways to prevent the rusting of iron.



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86. List the properties of magnetic lines of force.



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87. Differentiate between metal and non-metal on the basis of their chemical properties.



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88. Show how you would connect three resistors, each of 6Ω , so that the combination has a resistance of (a) 9Ω , (b) 4Ω .



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89. Draw a sketch of the pattern of field lines

due to a:

(a) current flowing into a circular coil,

(b) solenoid carrying current.



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90. If the image formed by a lens for all positions of an object placed in front of it is always erect and diminished, what is the nature of this lens ? Draw a ray diagram to

justify your answer. If the numerical value of power of this lens is 10 D, what is its focal length in cartesian system ?



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91. (a) Water is an elixir of life, a very important natural resource. Your Science teacher wants you to prepare a plan for a formative assessment activity, "How to save water, the vital natural resource." Write any two ways that you will suggest to bring awareness in

your neighbourhood, on 'how to save water'.

(b) Name and explain any one way by which the underground water table does not go down further.



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92. (a) Explain solar cell panel.

(b) Give the principle of working of a windmill.



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93. (a) If the image formed by a mirror for all positions of the object placed in front of it is always diminished, erect and virtual, state the type of the mirror and also draw a ray diagram to justify your answer. Write one use such mirrors are put to and why?

(b) Define the radius of curvature of spherical mirrors. Find the nature and focal length of a spherical mirror whose radius of curvature is +24 cm.



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94. (a) A student suffering from myopia is not able to see distinctly the objects placed beyond $5m$. Two possible reasons due to which this defect of vision may have arisen.

With the help of ray diagrams, explain :

(i) Why the student is unable to see distinctly the objects placed beyond $5m$ from his eyes.

(ii) The type of corrective lens used to restore proper vision and how this defect is corrected by the use of this lens.

(b) If in this case, numerical value of focal length of corrective lens is $5m$, find the power

of the lens as per the new cartesian sign convention.



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95. If the image formed by a spherical mirror for all positions of the object placed in front of it is always erect and diminished, what type of mirror is it? Draw a labelled ray diagram to support your answer.



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96. State the laws of refraction of light. Explain the term 'absolute refractive index of a medium' and write an expression to relate it with the speed of light in vacuum.



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97. What is meant by power of a lens? Write its SI unit. A student uses a lens of focal length 40 cm and another of -20 cm. Write the nature and power of each lens.



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98. Show how would you join three resistors, each of resistance 9Ω so that the equivalent resistance of the combination is (i) 13.5Ω , (ii) 6Ω ?



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99. (a) Write Joule's law of heating.

(b) The lamps, one rated $100\text{ W}, 220\text{ V}$, and the other $60\text{ W}, 220\text{ W V}$, are connected parallel to

electric mains supply. Find the current drawn two bulbs from the line,if the supply voltage is 220 V.



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100. (a) List the factors on which the resistance of a conductor in the shape of the wire depend.

(b) Why are metals good conductors of electricity whereas glass is a bad conductor of electricity ? Give reason .

(c) Why are alloys commonly used in electrical heating devices ? Give reason.



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101. What is dam ? Why do we seek to build large dams ? While building large dams, which three main problems should particularly be addressed to maintain peace among local people ? Mention them .



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102. (a) Write the steps involved in the extraction of pure metals in the middle of the activity series from their carbonate ores.

(b) How is copper extracted from its sulphuric ore? Explain the various steps supported by chemical equations. Draw labelled diagram from the electrolytic refining of copper.



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103. (a) The modern periodic table has been evolved through the early attempts of

Dobereiner, Newland and Mendeleev. List one advantage and one limitation of all the three attempts.

(b) Name the scientist who first of all showed that atomic number of an element is a more fundamental property than its atomic mass.

State Modern periodic law.



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104. (a) A student is unable to see clearly the words written on the black board placed at a

distance of approximately 3 m from him. Name the defect of vision the boy is suffering from. State the possible causes of this defect and explain the method of correcting it.



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105. (a) Write the function of each of the following parts of human eye :

(i) Cornea

(ii) Iris

(iii) Crystalline lens

(iv) Ciliry muscles



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106. (a) State Fleming's left hand rule.

(b) Write the principle of working of an electric motor.

(c) Explain the function of the following parts of an electric motor.

(i) Armature , (ii) Brushes , (iii) Split ring



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107. Draw in sequence (showing the four stages), the process of binary fission in Amoeba.



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108. An object of height 4.0 cm is placed at a distance of 30 cm from the optical centre 'O' of a convex lens of focal length 20 cm. Draw a ray diagram to find the position and size of the image formed. Mark optical centre 'O' and

principal focus 'F' on the diagram. Also find the approximate ratio of size of the image to the size of the object.



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109. The values of current (I) flowing through a given resistor of resistance (R), for the corresponding values of potential difference (V) across the resistor are as given below :

| | | | | | | | | |
|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| V (volts) | 0.5 | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 4.0 | 5.0 |
| I (amperes) | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.8 | 1.0 |

Plot a graph between current (I) and potential

difference (V) and determine the resistance (R) of the resistor.



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110. An object is kept 40 cm in front of a concave mirror of focal length of 20 cm. Find the position and nature of the image. Draw a ray diagram to show the formation of image in this case.



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111. We wish to obtain an equal sized inverted image of a candle flame on a screen kept at a distance of 4 m from the candle flame.

(a) Name the type of lens that should be used.

(b) what should be the focal length of the lens and at what distance from the candle flame the lens be placed ?

(c) Draw a labelled diagram to show the image formation in this case.



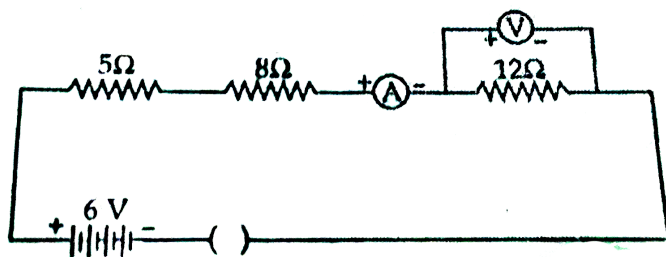
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112. A 5 cm tall object is placed at a distance of 30 cm from a convex mirror of focal length 15 cm. Find the position, size and nature of the image formed.



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113. Consider the following circuit :



What would be the readings of the ammeter

and the voltmeter when key is closed ? Give reason to justify your answers .



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114. What is electrical resistivity ? Derive its SI unit, In a series electrical comprising a resistor made up of metallic wire, the ammeter reads , 100 mA. If the length of the wire is doubled, how will the current in the circuit change ? Justify your answer.



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115. Calculate the total cost of running the following electrical devices in the month of September, if the rate of 1 unit of electricity is ₹6.00.

(i) Electric heater of 1000 W for 5 hours daily.

(ii) Electric refrigerator of 400 W for 10 hours daily.



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116. (a) What is presbyopia ? State its cause.

How is it corrected ?

(b) Why does the sun appear reddish early in the morning ? Explain with the help of a labelled diagram.



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117. (a) What are magnetic field lines ? How is the direction of magnetic field at a point in a magnetic field determined using field lines ?

(b) Two circular coils X and Y are placed close to each other. IF the current in the coil X is changed, will some current be induced in the coil Y ? Give reason.

(C) State " Fleming's right hand rule .



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Section B

1. Give any four precautions taken by a student to perform an experiment to determine the

resultant resistance of two resistors when connected in series.



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2. Why does a ray of light while passing through a prism, bend towards its base?



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3. (a) What is least count of voltmeter ?

(b) In a voltmeter there are 20 divisions

between the '0' mark and 0.5 V mark. Calculate its least count.



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4. What are the precautions taken to prepare a temporary mount of a leaf peel to show its stomata?



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5. List the factors on which the angle of deviation through a prism depend?



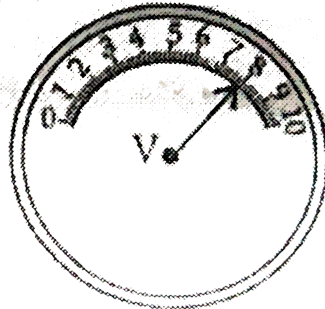
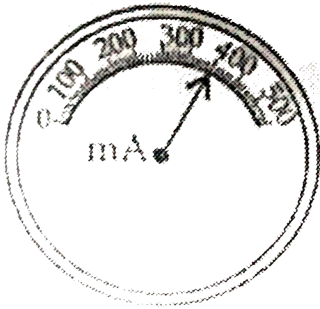
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6. The reading of current flowing through a conductor and the potential difference its two end are shown in the ammeter and voltmeter given below. What will be the value of

resistance

in

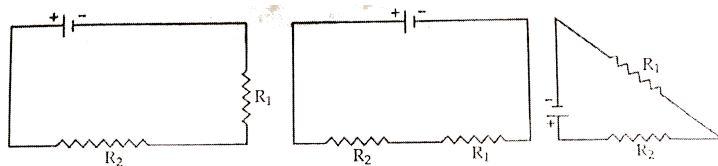
it?



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7. Two resistance $R_1 = 10$ ohm and $R_2 = 10$ ohm are to be connected with 20V battery. Out of which of the following maximum

current will flow. Calculate its magnitude.



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8. For finding the focal length of a concave mirror, where do we keep the object? What is the position of image formed? On which structure we get the image? What is the nature of the image formed?



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9. A student prepared a temporary mount of a leaf peel and observed some green dots.

(i) Name these green dots and name the pigment present in them.

(ii) State the function of this pigment.



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10. Which is smaller, terminal-p.d. or e.m.f. of a cell and why ?



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11. When a ray of light passes through a glass slab how many times does it change its path and why ?



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12. A student while verifying Ohm's law calculated the value of resistance of the resistor for each set of observation .However, the values of resistance were slightly different

from the actual value . Is his experiment wrong

? Justify your answer.



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13. To find the image-distance for varying object-distances in case of a convex lens, a student obtains on a screen a sharp image of a bright object placed very far from the lens. After that he gradually moves the object towards the lens and each time focuses its image on the screen.

(a) In which direction-towards or away from the lens, does he move the screen to focus the object ?

(b) What happens to the size of image - does it increase or decrease?

(c) What happen when he moves the object very close to the lens ?



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14. Draw a labelled circuit diagram to study the dependence of current (I) on the potential

difference (V) across a resistor.



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15. Students were asked to observe the permanent slides showing different stage of budding in yeast under high power of a microscope.

(a) Which adjustment scraw (coarse/fine) were you asked to move to focuss the slides?

(b) Draw three diagrams in correct sequence showing budding in yeast.



16. A 4 cm tall object is placed on the principal axis of a convex lens. The distance of the object from the optical centre of the lens is 12 cm and its sharp image is formed at a distance of 24 cm from it on a screen on the lens, in the which ways (towards the lens or away from the lens) will he have to move the screen to get a sharp image of the object on it again?

How will the magnification of the image be affected ? .



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17. In an experiment , to study the dependence of potential difference (V) on the electric current (I) across a conductor (resistor), if the circuit is on for long time, then -select two correct options from the following:

- (i) Zero error of an ammeter will be changed.
- (ii) Zero error of a voltmeter will be changed .

(iii) Value of a resistance will be changed.

(iv) Resistor will be heated.



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18. Identify the observed various parts of temporary mount of well stained leaf peel, when focussed under the high power of a microscope.



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19. A student focuses the image of a well illuminated distant object on a screen using a convex lens. After that the gradually moves the object towards the lens and each time focuses its image on the screen by adjusting the lens.

(a) In which direction -towards the screen or away from the screen, does he move the lens ?

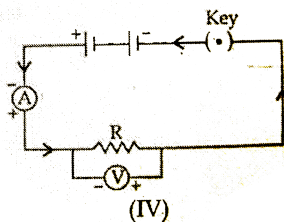
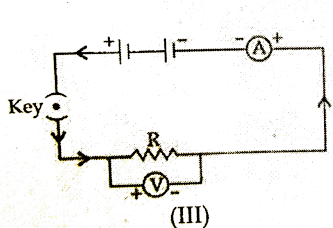
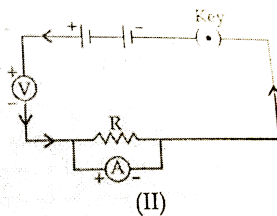
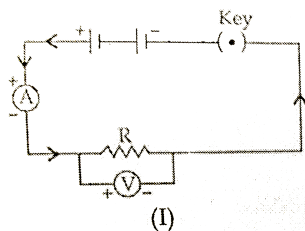
(b) What happens to the size of the image- does it decrease or increase ?

(c) What happens to the image on the screen

when he moves the object very close to the lens ?

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20. To study the dependence of potential difference (V) on current I across Resistor (R), Four circuit diagrams are prepared.



(i) Select the circuit diagrams which are correct.

(ii) Give reason for the circuit diagrams which are not correct.



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21. A student is viewing under a microscope a permanent slide showing various stages of asexual reproduction by budding in yeast. Draw diagrams of what he observes. (In proper sequence)



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22. An object of height 2.5 cm is placed at a distance of 15 cm from the optical centre 'O' of a convex lens of focal length 10 cm. Draw a ray diagram to find the position and size of the image formed. Mark optical centre 'O', principal focus F and height of the image on the diagram.



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23. Give any four precautions taken by a student to perform an experiment to determine the resultant resistance of two resistors when connected in series.



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24. A student places a candle flame at a distance of about 60 cm from a convex lens of focal length 10 cm and focuses the image of the flame on a screen. After that he gradually

moves the flame towards the lens and each time focuses the image on the screen.

(a) In which direction-toward or away from the lens, does he move the screen to focus the image ?

(b) How does the size of the image change ?

(c) How does the intensity of the image change as the flame moves towards the lens ?

(d) Approximately for what distance between the flame and the lens, the image formed on the screen is inverted and of the same size ?



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25. (a) What is least count of voltmeter ?

(b) In a voltmeter there are 20 divisions between the '0' mark and 0.5 V mark. Calculate its least count.



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26. A student focuses the image of a candle flame, placed at about 2 m from a convex lens of focal length 10 cm, on a screen. After that, he moves gradually the flame towards the lens

and each time its image on the screen.

(a) In which direction does he move the lens to focus the flame on the screen?

(b) What happens to the size of the image of the flame formed on the screen ?

(c) What difference is seen in the intensity (brightness) of the image of the flame on the screen ?

(d) What is seen on the when the flame is very close (at about 5 cm) to the lens ?



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27. While tracing the path of a ray of light passing through a rectangular glass slab a student tabulated his observations. If in his experiment for two readings he takes two values of $\angle i$ as 40° and 50° . What should be the correct values of $\angle e$ and $\angle r$ in each case ?



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28. Draw a labelled ray diagram for the formation of image by a convex lens of focal

length 15 cm when the object is placed at a distance of 25 cm from the lens. Determine the size of the image formed, if size of the object is 4 cm.



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29. You have following material :

An ammeter (0-1A0 ,a voltmeter (0-3V) , a resistor of 20Ω , a key, a rheostat, a battery of 3 V and seven connecting wires.

Using this material draw a labelled circuit

diagram to study the dependence of potential difference (V) across a resistor on the current (I) passing through it.



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Set I Section A

1. What is the function of the radial magnetic field in the moving coil galvanometer?



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Set I Section B

1. Define the term power of accommodation.

Write the modification in the curvature of the eye lens which enables us to see the nearby objects clearly.



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Set I Section C

1. Trace the sequence of events which occur when a bright light is focused on your eyes.



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2. What is a rainbow? Draw a labelled diagram to show the formation of a rainbow.



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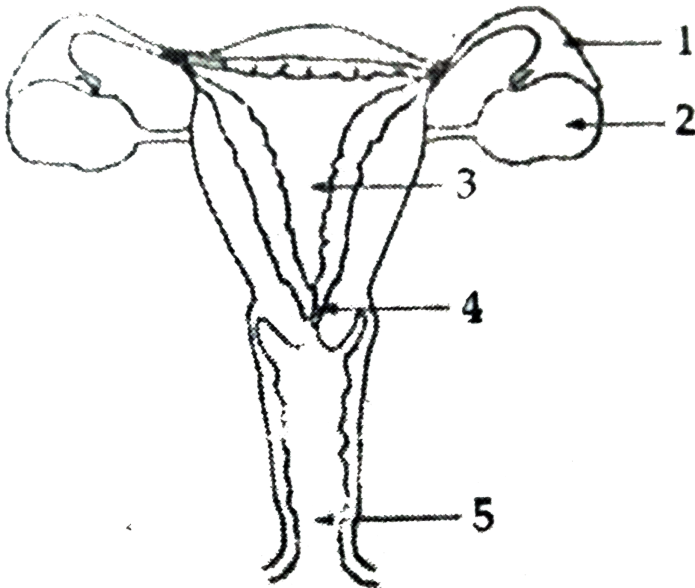
3. What is water harvesting? List two main advantages associated with water harvesting at the community level. Write two causes for the failure of sustained availability of groundwater.



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Set I Section D

1. (a) Identify the diagram. Name the parts 1 to 5.



(b) What is contraception? List three advantages of adopting contraceptive measures.

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2. An object is placed at a distance of 60 cm from a concave lens of focal length 30 cm.

(i) Use lens formula to find the distance of the image from the lens.

List four characteristics of image (nature, position, size, erect/inverted) formed by the lens in this case.

(iii) Draw any diagram to justify your answer of part (ii).



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3. (a) With the help of a suitable circuit diagram prove that the reciprocal of the equivalent

resistance of a group of resistances joined in parallel is equal to the sum of the reciprocals of the individual resistances.

(b) In an electric circuit two resistors of 12Ω each are joined in parallel to a $6V$ battery.

Find the current drawn from the battery.



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4. An electric lamp of resistance 2Ω and a conductor of resistance 4Ω are connected to a $6V$ Battery as shown in the circuit. Calculate:

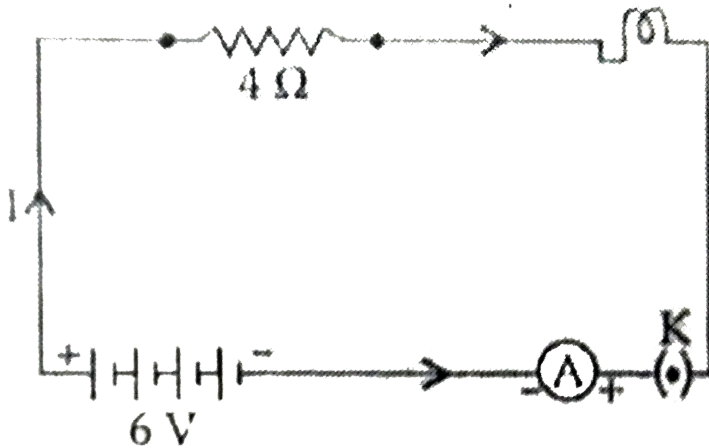
(a) the total resistance of the circuit,

(b) the current through the circuit,

(c) the potential difference across the (i) electric lamp

and (ii) conductor, and

(d) power of the lamp.



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5. What is a solenoid? Draw the pattern of magnetic field lines of (i) a current carrying solenoid and (ii) a bar magnet. List two

distinguishing features between the two fields.



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Set I Section E

1. Explain the process of budding in Hydra with the help of labelled diagram.



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2. While studying the dependence of potential difference (V) across a resistor on the current

(I) passing through it, in order to determine the resistance of the resistor, a student took 5 readings for different values of current and plotted a graph between V and I . He got a straight line graph passing through the origin. What does the straight line signify? Write the method of determining resistance of the resistor using this graph.



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3. What would you suggest to a student if while performing an experiment he finds that the pointer/needle of the ammeter and voltmeter do not coincide with the zero marks on the scales when circuit is open? No extra ammeter/voltmeter is available in the laboratory.



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4. List four precautions which a student should observe while determining the focal length

of a given convex lens by obtaining image of a distant object on a screen.



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Set II Section A

1. Name and define the SI unit of current.



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Set II Section C

1. Define the term transpiration. Design an experiment to demonstrate this process.



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Set II Section D

1. An object is placed at a distance of 30 cm from a concave lens of focal length 30 cm.

(i) Use lens formula to determine the distance of the image from the lens.

(ii) List four characteristics of the image (nature position, size, erect/inverted) in this case.

(iii) Draw a labelled diagram to justify your answer of part (ii).



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Set Iii Section A

1. If you could use any source of energy for heating your food, which one would you use and why ?



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2. Write the function of voltmeter in an electric circuit.



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Set Iii Section B

1. What happens to the image distance in the normal human eye when we decrease the distance of an object, say 10 m to 1 m? Justify your answer.



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Set Iii Section C

1. Nervous and hormonal systems together perform the function of control and coordination in human beings.' Justify the statement.



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Set Iii Section D

1. (a) Draw magnetic field lines produced around a current carrying straight conductor

passing through a cardboard. Name, state and apply the rule to mark the direction of their field lines.

(b) How will the strength of the magnetic field change when the point where magnetic field is to be determined is moved away from the straight wire carrying constant current? Justify your answer?



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Set I Section A

1. Define resistance of conductor.also give its units



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2. Name any two elements that are used in fabricating solar cells.



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Set I Section B

1. State laws of reflection of light.



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2. Define absolute refractive index.



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3. Draw magnetic field lines around a bar magnet.



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1. A coil of insulated copper wire is connected to galvanometer. What would happen if a bar magnet is

- (i) pushed into the coil?
- (ii) withdrawn from inside the coil?
- (iii) held stationary inside the coil?



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1. A person is unable to see objects distinctly placed within 50 cm from his eyes.

(a) Name the defect of vision the person is suffering from and list its two possible causes.

(b) Draw ray diagram to show the defect in the above case.

(c) Mention the type of lens used by him for the correction of the defect and calculate its power. Assume that the near point for the normal eye is 25 cm.

(d) Draw a labelled diagram for the correction of the defect in the above case.



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2. (a) Define Electric power. An electrical device of resistance R is connected across a source of voltage V and draws a current I . Derive an expression for power in terms of current and resistance.

(b) Two electric bulbs rated $100W$, $220V$ and $60W$, $220V$ are connected in parallel to an electric mains of $220V$. Find the current drawn by the bulbs from the mains.



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3. How will you infer with the help of an experiment that the same current flows through every part of the circuit containing three resistors, R_1 , R_2 and R_3 in series connected to a battery of V volts?

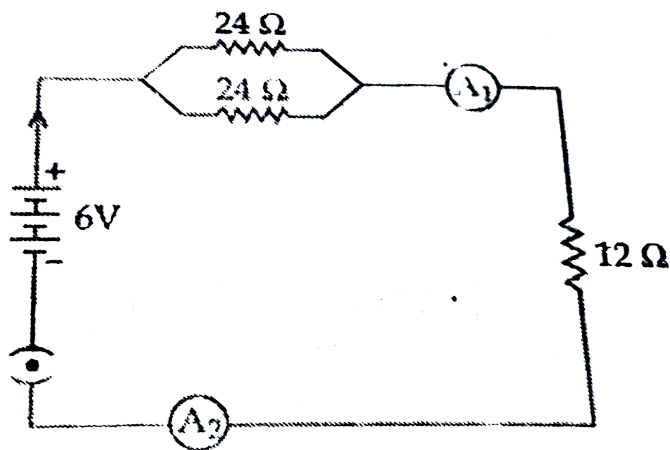


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4. Study the given circuit and find out:

(i) Current in 12Ω resistor,

(ii) Difference in the reading of A_1 and A_2 , if any.



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5. Why is vegetative propagation practised for growing some types of plants?

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6. What is contraception? List its four different methods. State four reasons for adopting contraceptive methods.

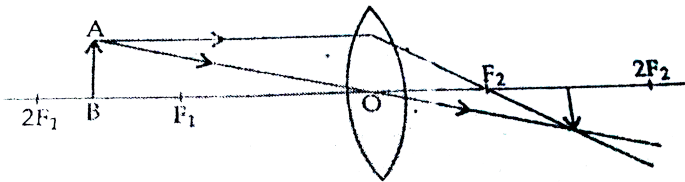


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Set I Section E

1. Study the following ray diagram and list any two mistakes committed by the student while

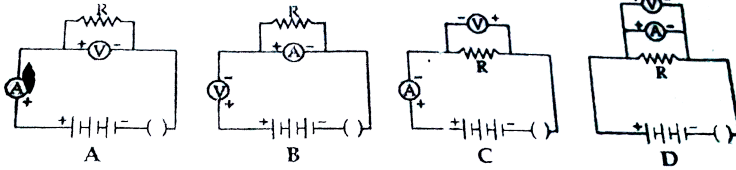
tracing it. Rectify these mistakes by drawing the correct ray diagram to show the real position and size of the image corresponding to the position of the object AB.



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2. Which of the following is the correct set-up for studying the dependence of the current on the potential difference across a resistor and

why?



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3. Write four sequential steps of the procedure of experiment "Preparing a temporary mount of a leaf peel to show stomata."



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4. List two observations on the basis of which it may be concluded that the given slide shown binary fission in Amoeba.



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Set II Section A

1. Define current. Give its S.I. unit.



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Set II Section B

1. State laws of refraction of light.



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2. List four characteristics of the image formed by a concave mirror of focal length 40 cm when the object is placed in front of it at a distance of 20 cm from its pole.



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3. Write the name and molecular formula of an organic compound having its name suffixed with '-ol' and having two carbon atoms in the molecule. With the help of a balanced chemical equation indicate what happens when it is heated with excess of conc. H_2SO_4 .



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Set II Section C

1. Define the time evolution. " Evolution cannot be equated with progress. " Give examples to justify this statement.



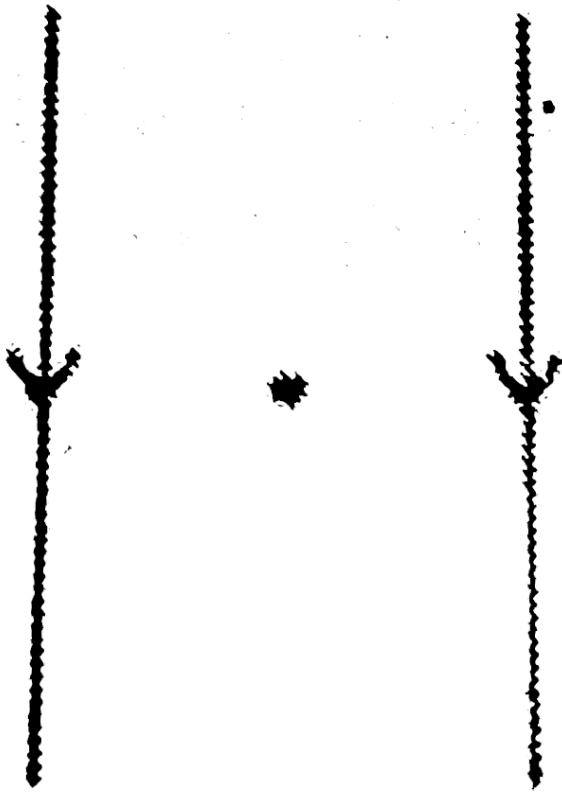
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2. The following diagram shows two parallel straight conductors carrying same current. Copy the diagram and draw the pattern of the magnetic field lines around them showing their directions. What is the

magnitude of magnetic field at a point 'X'

which is equidistant from the conductors ?

Given justification for your answer.



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3. What would be the advantages of exploiting resources with short-term aims?



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Set Iii Section A

1. Mention the condition under which a current can flow in a conductor .



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2. List two merist of solar cells.



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Set Iii Section B

1. List four characteristics of the image formed by a convex lens of focal length 20 cm when the object is placed in front of it is a distance of 10 cm from its optical centre .



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2. Define refractive index of a transparent medium . The speed of light in a medium of absolute refractive index 1.5 is $2 \times 10^8 \text{ms}^{-1}$. What is the speed of light in vacuum ?



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3. It is established that an electric current through a conductor produces a magnetic field around it . Is there a similar magnetic field

produced around a thin beam of moving (i) alpha particles, (ii) neutrons ? Justify your answer in each case .



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Set Iii Section C

1. State right hand thumb rule to determine the direction of magnetic field around a current carrying conductor. Apply this rule to find the direction of magnetic field inside and

outside a circular loop of wire lying in the plane of a table and current is flowing through it clockwise .



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