



PHYSICS

Set A

PART 1A

Answer **any 4 questions** from 1 to 6. (1 score each.)

1. Identify the relation between the first pair and complete the second. (1)
Heating coil: Nichrome Safety fuse: _____

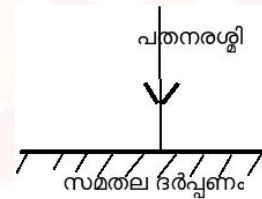
2. Find the correct statement. (1)

- The resistance of the coil of the heaters with high power is more.
- The resistance of the coil of the heaters with high power is less.
- There is no relation between the power and resistance of the heaters.

3. The frequency of the electricity available for industrial purpose in India isHz. (1)

4. Observe the figure of a light ray falling normal to a plane mirror. (1)
Find the incident angle from the given below.

[90° , 0° , 180° , 60°]



5. The critical angle of glass is 42° . Which of the given measurements of incident angles shows a possibility for Total internal reflection. (1)

[42° , 40° , 46° , 24°]

6. Choose the correct statement related to dispersion of light. (1)

- a) The deviation of the colour with longest wavelength is less.
- b) The deviation of the colour with longest wavelength is more.
- c) Wavelength does not influence the deviation of light.
- d) The deviation of the colour with highest frequency is less.

PART 1B

Answer **all questions** from 7 to 9. 1 score each.

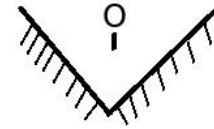
7. Identify the relation between the first pair and complete the second. (1)

The direction of the magnetic field around a current carrying conductor : Right hand thumb rule.

The direction of the motion of an electric conductor situated in a magnetic field:

8. Two plane mirrors are placed 60° apart. If an object O is placed at its centre, how many images are formed? (1)

[2, 3, 4, 5]



9. The distance to the near point of a healthy person is (1)

[25cm, infinity, 25m, None of these]

PART 2A

Answer the given question.(2 Score)

10. Answer the questions related to the loud speaker.

a) Write down the energy change in a loud speaker. (1)

b) What is the working principle of a loud speaker? (1)

PART 2B

Answer **any 1 questions** from question number 11 and 12.(2 Score)

11. Earthing is necessary to ensure safety in current distribution.

a) What is earthing? (1)

b) What are the precautions to be taken to avoid electric shock? (1)

12. Now-a-days LED bulbs are used commonly. Write any 2 merits of LED bulbs compared to other bulbs.(2)

PART 3A

Answer **any 3 questions** from 13 to 16.3 score each.

13. A magnetic field is developed around a current carrying solenoid.

a) Which is the method used to find the polarity of the solenoid with the help of the direction of electric current. (1)

b) Write any 2 methods to increase the strength of an electromagnet. (2)

14. There are 100 turns in the primary coil and 5000 turns in the secondary coil of a transformer.

a) Which type of transformer is this? (1)

b) Write the working principle of a transformer. (1)

c) Why thicker wires are used in the secondary coil of a step down transformer? (1)

15. A convex lens of focal length 25 cm is given.

a) Write the equation to find the power of the lens. (1)

b) Find the power of the above lens. (1)

c) What change will happen to the power when the focal length increases? (1)

16. Rainbow is formed by the dispersion of light.

a) What is the colour seen in the upper edge of the rainbow? (1)

b) Explain the change that happens to the sunlight through a water droplet during the formation of rainbow? (2)

PART 3B

Answer the given question.(3 Score)

17. In early times incandescent lamps were used for lighting purpose.

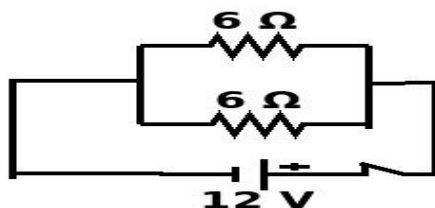
a) Which material is used as filament in an incandescent lamp? (1)

b) Write any 2 characteristics of the filament. (2)

PART 4A

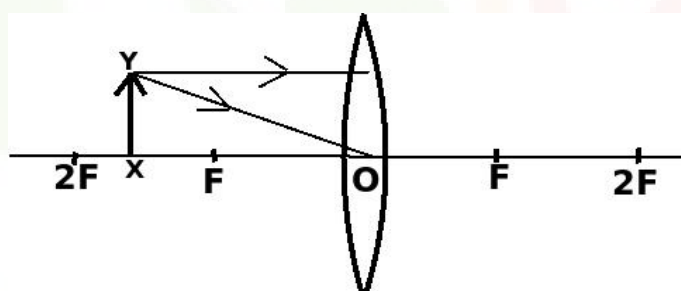
Answer **any 2 questions** from 18 to 20 (4 score each.)

18. Two $6\ \Omega$ resistors are connected as shown in the circuit. Observe the circuit and answer the following questions.



- In which method resistors are connected in the circuit? (1)
- Calculate the effective resistance when current flows through the circuit? (1)
- Draw a circuit diagram so that an effective resistance of $12\ \Omega$ is obtained using the components of this circuit. (2)

19. An object XY is placed on the principal axis of a convex lens. Observe the figure and answer the following questions.



- Choose the position of the object in the figure from the given measurements in the bracket.
[Beyond $2F$, Between F and $2F$, Between F and O , At $2F$] (1)
 - Where is the position of the image on the other side of the lens? (1)
 - Complete the ray diagram of the image formation. (2)
20. When an object is placed on the principal axis at a distance of 40 cm from the pole of a spherical mirror, an inverted image is formed at a distance of 20cm. Answer the following questions.
- Which type of spherical mirror is this? (1)
 - Write the mirror equation. (1)
 - Write down the distance to the object and distance to the image using new Cartesian sign convention? (1)
 - Find the magnification of the image.(Use new Cartesian sign convention) (1)

21. A Watt hour meter is connected first in a house hold electrical circuit.

- a) What is the purpose of a watt hour meter? (1)
- b) Which is the commercial unit of electrical energy? (1)
- c) The devices to be connected after the watt hour meter in a house hold electric circuit are given in the bracket. Write these devices in the correct order to be connected in the circuit.

[Main switch, Main fuse, MCB distribution board, ELCB] (2)

1	2	3	4	5
watt hour meter	_____	_____	_____	_____

22. Snell's law helps to determine the refractive index of the medium.

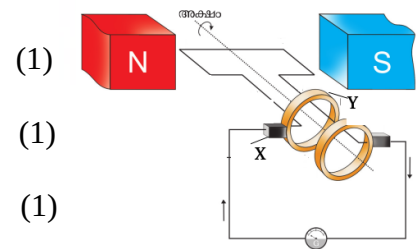
- a) Express Snell's law in the form of equation. (1)
- b) What is absolute refractive index? (1)
- c) The speed of light in air is 3×10^8 m/s and in glass is 2×10^8 m/s. Calculate the refractive index of glass with respect to air. (2)

PART 5

Answer **any 1** question from question number 23 and 24 . (5 score)

23. The figure of a generator is given. Answer the questions based on the figure.

- a) What is the energy change in a generator? (1)
- b) Whether AC generator or DC generator is given in the figure. (1)
- c) What is the working principle of a generator? (1)
- d) Identify the parts marked X and Y in the figure. (1)
- e) Draw the graphic representation of the electricity generated by this type of generators. (1)



24. The resistance of the heating coil of an electric heater working in 230V potential difference is 115Ω .

- a) What is the energy change in a heating coil? (1)
- b) Calculate the current through the electric heater when it works. (1)
- c) Find the power of the heater. (1)
- d) Which are the factors that influence the heat generated in the heater? (1)

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