

## PHYSICS

Standard: X

Time : 1½ Hour  
Total Score : 40

**Instructions**

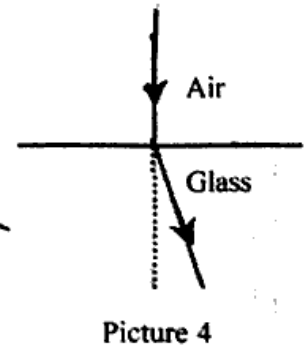
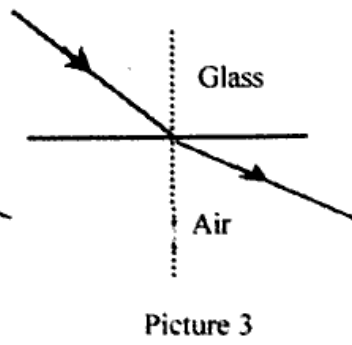
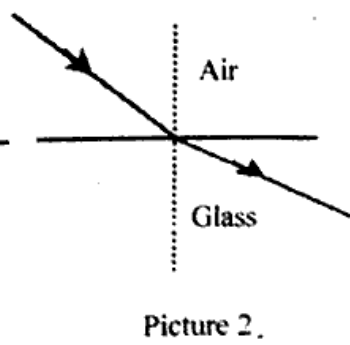
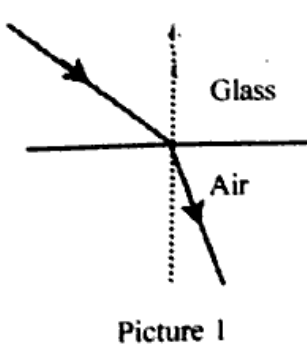
- First 15 minutes is given as cool off time. This time is to be spent for reading and understanding the questions.
- Answer the questions based on instructions.
- Answer the questions according to score and time

Answer any **FOUR** questions from 1 to 5. Each question carries 1 score. (4 x 1 = 4)

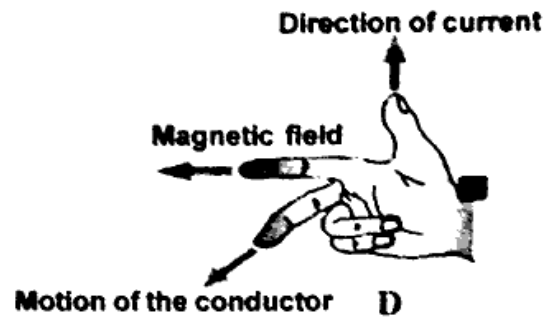
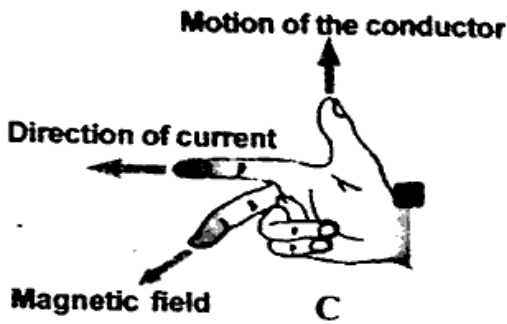
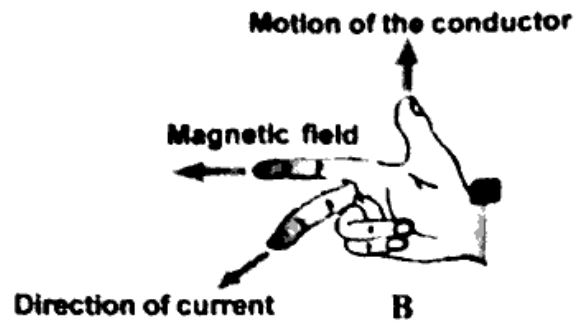
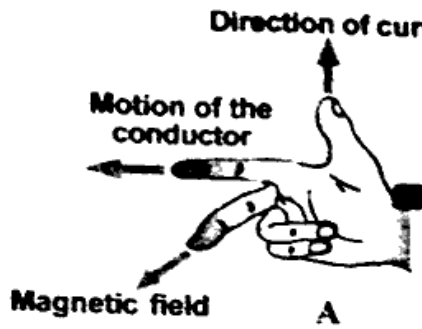
1) Find MCB and Watt hour meter from the following?



- 2) What is the voltage of electricity generated for power transmission in India?  
( 230V, 1100V, 110kV, 11kV)
- 3) Find out the number of images seen if the two plane mirrors are arranged at an angle of 120°.  
[1, 2, 3, 4]
- 4) The figure given below shows a ray of light passing through two different media. Choose the correct image from the following?



- 5) Which of the following picture is correct according to Fleming's right-hand rule?



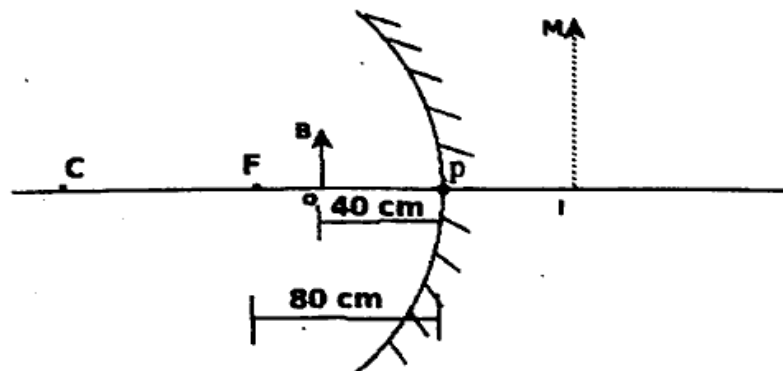
Answer any **FOUR** questions from 6 to 10. Each question carries 2 score. (4 x 2 = 8)

- 6) Fill in part a,b,c.and d of the table given below most suitably.

Situations	Mirror used	Use of the mirror
For the object placed between principal focus and pole, the images formed are enlarged and erect.	Concave mirror	Shaving mirror
Mirror Converges distant rays to the principal focus.	(a) .....	(b) .....
Image is always formed in between the focus and the pole of the mirror	(c) .....	(d) .....

(4 x 1/2 = 2)

- 7) Analyse the figure and answer to the following questions based on the new Cartesian sign convention? (1+1)



- a) Write the mirror equation.  
 b) A large, virtual and erect image is formed by the mirror. Calculate the distance from pole to the image.
- 8) Electrical shock is a dangerous hazard. Write any four precautions to be taken to avoid electrical shock while handling electrical appliance. (2)

9) Match the following suitably.

(1+1)

1	Total internal reflection	Convex mirror
2	Rear view mirror	Endoscope
		Concave mirror

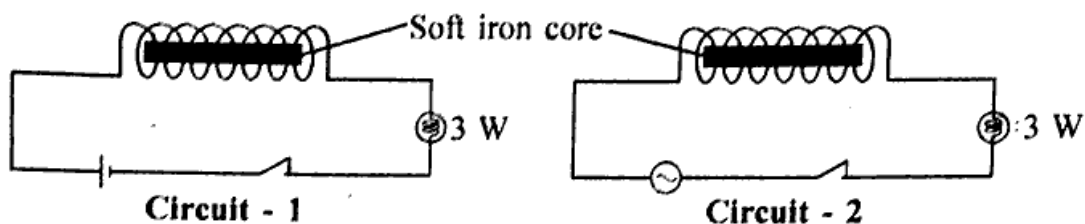
10) Answer the following questions about the incandescent lamps.

- What is the reason for filling of an inert gas/nitrogen in an incandescent lamp?
- Write any two properties of Tungsten that make it suitable for being used as a filament?

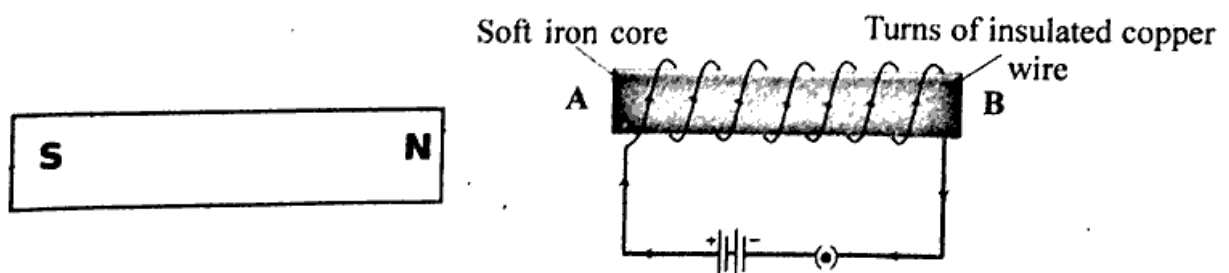
Answer any **FOUR** questions from 11 to 15. Each question carries 3 score. (4 x 3 = 12)

11) Analyse the circuits and answer the following questions.

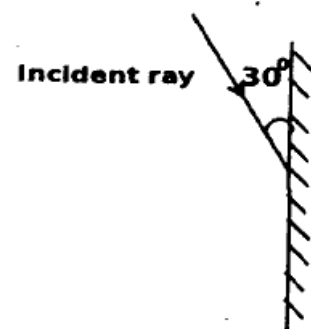
(1+2)



- A student said that magnetic field is developed around the solenoid in the second circuit only. Explain your opinion about the statement.
  - In which circuit, a continuous emf produced. Name this phenomenon and explain.
- 12) Three resistors are given. Their values are of  $2\Omega$ ,  $3\Omega$  and  $6\Omega$ .
- Find out the maximum resistance that can be made with all these three in a circuit.
  - Illustrate how to setup a circuit with  $4.5\Omega$ , effective resistance using all three given resistances ( $2\Omega$ ,  $3\Omega$ ,  $6\Omega$ ). (1+2)
- 13) The following figure represents a permanent magnet and an electromagnet. (1+2)



- Find out the polarity of the electromagnet at A.
  - Write any two differences between a permanent magnet and an electromagnet.
- 14) The diagram represents an incident ray falling on a plane mirror.
- Find the incident angle using the given diagram.
  - State the laws of reflection. (1+2)



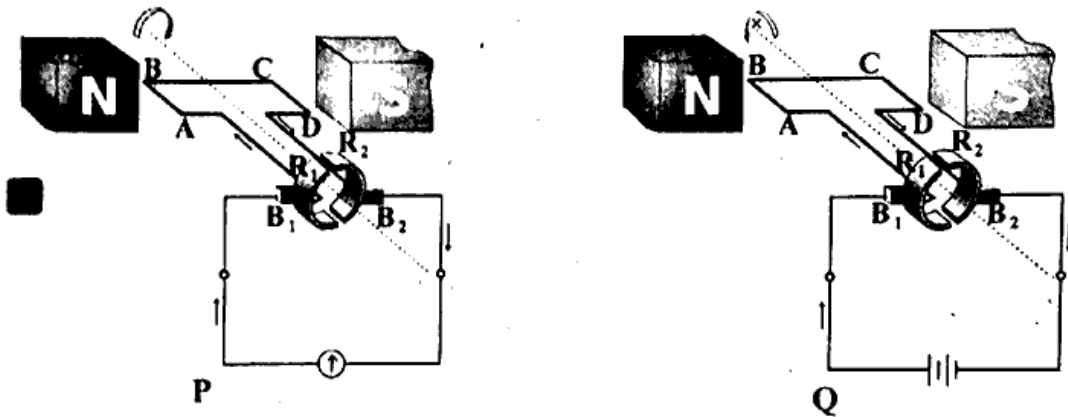
15) Analyse the following table and write answer to the questions.

Medium	Speed of light (m/s)
Vacuum/Air	$3 \times 10^8$ m/s
Water	$2.25 \times 10^8$ m/s
Glass	$2 \times 10^8$ m/s (approximately)

- Find out the medium which has highest optical density from the table.
- Calculate the refractive index of glass with water.
- What is absolute refractive index of a medium. (1+1+1)

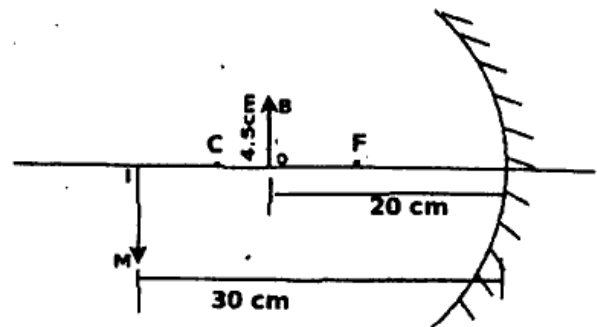
Answer any **FOUR** questions from 16 to 20. Each question carries 4 score. (4 x 4 = 16)

16) Observe the figures.



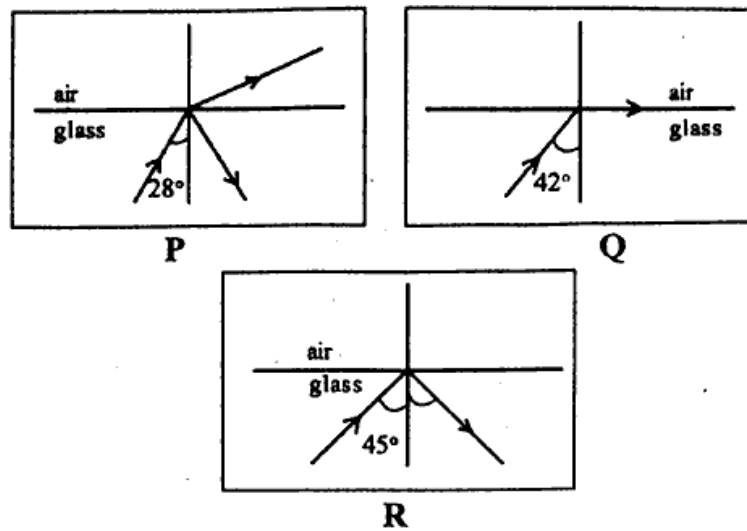
- Identify the devices P, Q and write it's name.
  - Write down the difference in function of split rings in these devices.
  - Write the working principles of each of these devices. (1+2+1)
- 17) A transformer having no power loss has 5000 turns in its primary. The current in the primary coil and secondary coil are 0.1A and 10A respectively.
- Which type of transformer is this? (Step up/ Step down)
  - Calculate the secondary voltage if the applied voltage in the primary is 1100V.
  - Calculate the output power of this transformer. (1+2+1)
- 18) The following diagram represents the image formation in a concave mirror. (use New Cartesian Sign Conventions to solve the problems).

- Write the object distance (u) and the image distance (v).
- Define magnification in mirrors? Find out the magnification (m).
- Calculate the height of the image in the figure, If the height of the object is 4.5 cm.

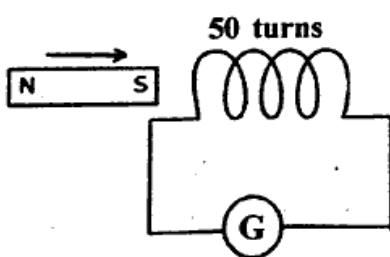


(1+2+1)

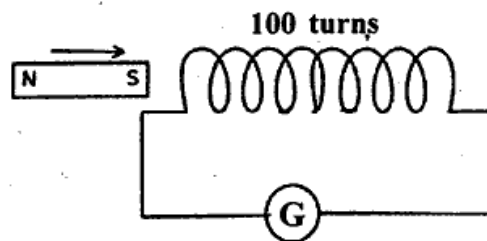
- 19) The path of light through different media is shown in the following figure Analyse them and answer the following questions.



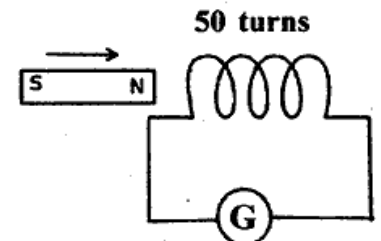
- Find out critical angle of glass.
  - Which figure represents the total internal reflection?
  - Explain how total internal reflection takes place in glass by referring the above figures. (1+1+2)
- 20) Three students are doing the same experiment by using the following sets of solenoids and magnets. (magnets are identical, and the solenoids are wound in clockwise direction with the same type of wire).



Experiment 1



Experiment 2



Experiment 3

- Why the galvanometer needle deflects while the magnet moves towards the solenoid?
- Among the experiments 1, 2 and 3 identify the solenoids which produce the same direction of deflection when the magnet is moved towards the coil.
- Write any two methods to increase the induced emf in the solenoid. (1+1+2)