SET - A **E 1006 - Ph**

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Summative Assessment - II Term, 2025 - 26

PHYSICS

Standard : X **Time : 1½ hour**
Total Score : 40

Instructions

- The first 15 minutes is cool-off time. Use this time to read and understand the questions and plan your answers.
- This question paper has 18 questions in sections A, B, C, and D.
- Choices are provided for questions 7, 11, 12, 17, and 18.
- For the questions that offer a choice, you only need to answer one of the options.

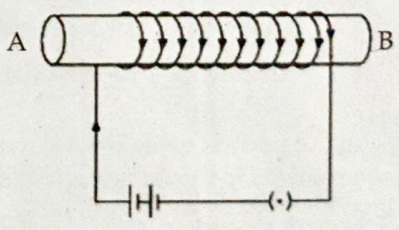
Section - A

Write answer for all questions from 1 to 4. Each question carries 1 score **(4 x 1 = 4)**

1. Which type of lens has a positive power? (1)
   a) Concave lens
   b) Convex lens
   c) Plano-concave lens
   d) None of these

2. Assertion: White light passing through a prism split into its component colours. (1)
   Reason: The deviation of different colours of light varies according to their wave length.
   a) Both assertion and reason are true, and reason is the correct explanation of assertion.
   b) Both assertion and reason are true, but reason is not the correct explanation of assertion.
   c) Assertion is true, but reason is false.
   d) Assertion is false, but reason is true.

3. A few statements are given about the magnetic poles formed at the ends A and B of a current-carrying solenoid. (1)
   i. North poles are formed at A and B.
   ii. When the electric current flows in the opposite direction, the magnetic polarity changes.
   iii. North pole is formed at A and South pole is formed at B.
   iv. South pole is formed at A and North pole is formed at B.



   Which of the following is the correct option?
   a) i and iii
   b) ii and iv
   c) iii and iv
   d) i and ii

4. Match the following: (1)

Parts of Step up transformer	Function	Structure
A. Primary coil	1. Output	i. Soft iron
B. Secondary coil	2. Confining flux	ii. Thin wire
C. Core	3. Input	iii. Thick wire

Choose the correct answer from the options given below,

a) A - 2 - iii, B- 1- ii, C – 3 – i
b) A - 1- iii, B- 3- ii, C – 2 – i
c) A - 3 - iii, B- 1- ii, C – 2 – i
d) A - 3 - iii, B-2- ii, C – 1 - i

Section - B

Answer questions from 5 to 11. Questions 7 and 11 have choices. Each question carries 2 score **(7 x 2 = 14)**

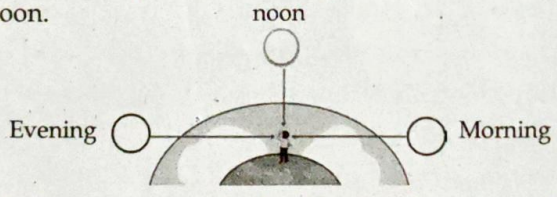
5. The distance between two consecutive particles in the same phase of vibration in a transverse wave is 4 m. If a particle in the medium take 5 s for 10 vibrations, what is the speed of this wave? (2)

6. A tuning fork is placed near a stretched string and made to vibrate. The string starts vibrating with the same frequency as the tuning fork. Give reason. Justify your answer.(2)

7 A. When a beam of light passes through a colloidal solution the path of the light becomes visible. Name the phenomenon that makes this effect. Give another occasion of this phenomenon experienced in daily life. (2)

OR

7 B. The given figure shows a person observing the Sun from the Earth during sunrise, sunset and at noon. (2)

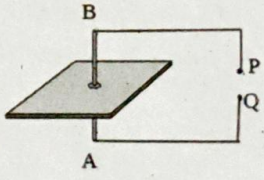


In which colours will the person view the Sun? Explain how you arrived at the answer.

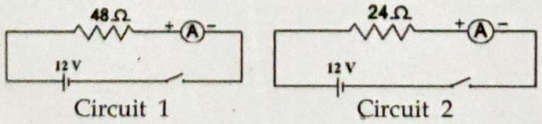
8. A conducting wire AB is fixed vertically through the center of a cardboard.

a) Which terminal of the cell is to be connected to the part P in the circuit to make the magnetic field around the conductor AB in the anticlockwise direction? (1)

b) State the rule that helped you to arrive at this conclusion. (1)



9. In the circuits given below, when current is passed for 5 minutes, 900 J of heat energy is produced in the first circuit and 3600 J of heat energy is produced in the second circuit.



Circuit 1 Circuit 2

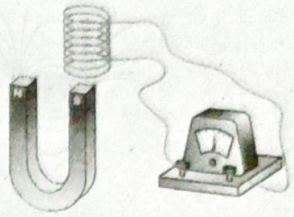
Explain the reason why more heat energy is produced in the second circuit, even though the time of flow of current and the voltage supplied are the same. (2)

10. A city is planning to implement a new public transportation system. What are the major steps you may adopt to reduce the carbon foot print? Explain. (2)

11 A. When a magnet is moved towards a coil an emf is induced.

a) What happens to the induced emf if the speed of the magnet is increased? Justify your answer. (1)

b) What will be the induced emf if the magnet and coil together moved in the same direction with the same speed? (1)

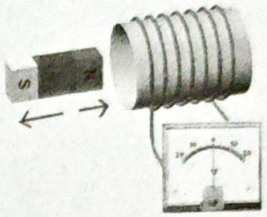


OR

11 B. A solenoid is placed in a changing magnetic field.

a) Which is the phenomenon behind the experiment illustrated here? Describe it. (1)

b) What are the factors that affect this phenomenon? (1)



Section - C

Answer questions 12 to 17. Each question carries 3 score. Questions 12 and 17 have choices. (6 x 3 = 18)

12 A. An object is placed 20 cm away from a concave lens. The image is formed at a distance 10 cm from the lens. Find the focal length of the lens. (Use Cartesian sign convention). (3)

OR

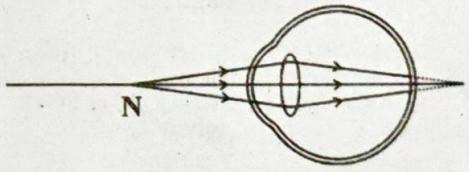
12 B. A concave lens has a focal length of 15 cm. An object is placed at a distance of 25 cm from the lens, and the image is formed at a distance of 10 cm from the lens. Find the magnification (Use Cartesian sign convention). (3)

13. The figure shows the image formation when an object is placed at the near point (N) of a person's eye.

a) What type of vision defect is it? Explain. (1)

b) How is this defect rectified? (1)

c) Compare the near point of this person with that of a normal eye. (1)



14. Patients undergoing MRI scanning are asked to remove all jewellery made of metal.

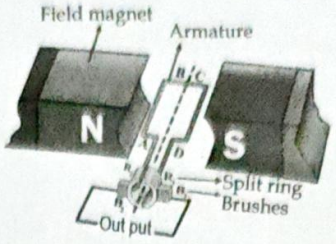
a) What might be the reason for this? Explain. (2)

b) What measures can be taken to prevent magnetic flux leakage? (1)

15. In a house 5 electric bulbs of 60 W each, 2 fans of 80 W each, and a refrigerator of 200 W are used 8 hours daily. Calculate the total energy consumed in one day. If the cost of electric energy is Rs. 5 per unit, calculate the cost of electric energy consumed in one month (30 days). (3)

16. A heating appliance is rated 400 W, 240 V. If the power produced by the appliance is only 100 W, calculate its operating voltage. (3)

17 A. Diagram of a generator is given.



a) What type of generator is this? How did you arrive at this inference? (1)

b) What is the arrangement that brings the emf induced in the armature to the external circuit? (1)

c) If the armature of the generator is kept stationary and the field magnet is rotated, what type of electricity will be obtained in the external circuit? Why? (1)

OR

17 B. There are many power stations in our country that produce electricity on a large scale by utilising various energy sources.

a) At what voltage is electricity generated in power stations? (1)

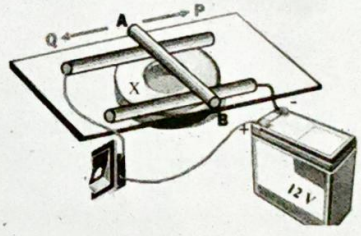
b) Write the energy conversion that takes place in a nuclear power station. (1)

c) Explain how a thermal power station works. (1)

Section - D

Answer any 1 question. Each carries 4 score. **(4 x 1 = 4)**

18 A. In the figure, a conductor AB is arranged across two parallel copper wires placed on an acrylic sheet which is kept above a ring magnet. A 12 V battery is connected to the parallel conductors through a bell switch.



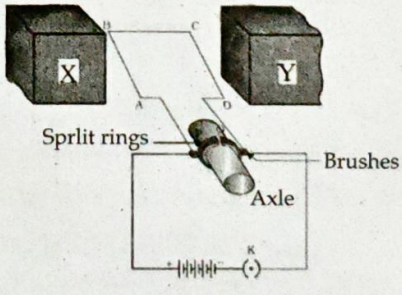
a) Which magnetic pole should be at the position of X for the conductor AB to move towards P? (1)

b) Which law helps in arriving at the answer? State that law. (2)

c) What change must be made to retain the initial direction of motion of the conductor when the polarity of the magnet is reversed? (1)

OR

18 B. Diagram of an electric motor is given. X and Y denote the magnetic poles.



a) Name the pole at Y when the side AB of the armature moves upwards. (1)

b) Draw a diagram illustrating the relationship between the direction of the magnetic field, the direction of the current, and the direction of the force experienced by the side AB. (1)

c) What change should be made in the circuit to rotate the armature in the opposite direction without changing the direction of the magnetic field? (1)

d) What is the energy conversion that takes place in this device? (1)