

SUMMATIVE ASSESSMENT - TERM II (2025-26)
PHYSICS MODEL QUESTION PAPER II

Instructions

- The first 15 minutes is cool-off time. This time is meant for reading the questions and planning your answers.
 - This question paper includes 18 questions in sections A, B, C, D.
 - Questions 5, 11, 13, 14, and 18 contain choices (OR).
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Section-A

Write down the correct answer by choosing from the given options for questions 1 to 4. Each question carries 1 score

1. Which device utilizes the conversion of Electric Energy to Mechanical Energy based on the motor principle?
 - a) AC Generator
 - b) Moving Coil Loudspeaker
 - c) Electric Motor
 - d) Transformer
2. If a solenoid is held with the right hand such that the fingers curl in the direction of the current, the thumb points toward the:
 - a) South pole
 - b) Direction of the magnetic field outside the solenoid
 - c) North pole
 - d) Axis of the solenoid
3. The characteristic of Nichrome wire that allows a short length to provide sufficient resistance for a heating element is its:
 - a) High melting point
 - b) High oxidation resistance
 - c) High resistivity
 - d) Low resistance
4. The commercial unit used to measure electric energy consumption in households is:
 - a) Joule (J)
 - b) Kilowatt (kW)
 - c) Kilowatt hour (kWh)
 - d) 10

d) Volt ampere (VA)

Section-B

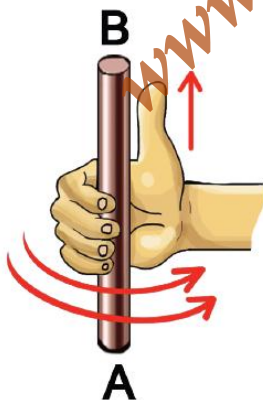
Write down the answers to the questions 5 to 11. Questions 5 and 11 have choices. Each question carries 2 score.

5. A. Explain the statement: "The magnetic force obtained from a coil of wire is temporary."

OR

B. List two factors that influence the strength or intensity of the magnetic field around a coil of wire.

6. A Moving Coil Loudspeaker works on the motor principle.
a) State the energy conversion that takes place in this device.
b) How does the vibration of the voice coil lead to the production of sound?
7. What is the **Motor Principle**? Give one example of a domestic appliance that works based on this principle. ¹⁷
8. A piece of insulated copper wire is wound in a spiral shape.
a) What is this arrangement called?
b) Explain one way to significantly increase the magnetic strength of this arrangement without changing the number of turns.
9. **Joule's Law** states that the heat produced in a conductor is directly proportional to three factors. List these three factors.
10. Explain the phenomenon of **Electromagnetic Induction**. Name the scientist who discovered this phenomenon experimentally.
- 11.

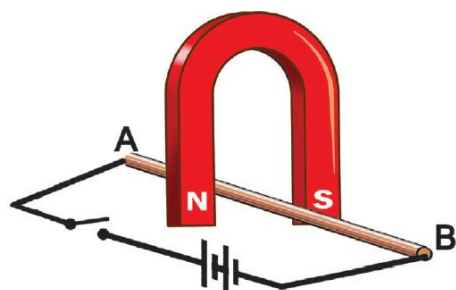


A straight current-carrying conductor (AB) is held with the right hand.

- a) State the rule used to find the direction of the magnetic field around the conductor.
- b) Describe the direction of the magnetic field based on this rule. ²⁵

OR

B.



A conducting rod (AB) is placed in the magnetic field of a horseshoe magnet and connected to a battery.

- a) State the law or principle that governs the rod's movement when current flows. 26b)
If the direction of the current is reversed, what must be done to keep the direction of motion of the rod unchanged?

Section-C

Write down the answers to questions 12 to 17. Questions 13 and 14 have choices. Each question carries 3 score.

12. The electric motor and the generator are two critical machines based on electromagnetism.

- a) What is the main difference in the energy conversion that occurs in an electric motor compared to a generator?
b) What is the specific function of the split ring commutator in a DC motor?

13. A. A heating appliance is marked 529W, 230V.

- a) What does the marking 529W indicate?
b) Calculate the resistance (R) of this heating appliance. (Show steps using $P = V^2 / R$)
c) Calculate the quantity of heat energy (H) produced if the appliance operates at the specified voltage for 10 minutes. (Show steps using $H = Pt$)

OR

B. Explain the characteristics of Nichrome wire that make it the most suitable material for the heating element in electric heating appliances. List any three.

14. A. The two types of generators are the AC generator and the DC generator.

- a) What are the main components (rings and brushes) that differ between the AC and DC generators?

b) Draw a simple graph showing the voltage (V) versus time (t) for the output obtained from a Cell and an AC Generator

OR

B. Energy conservation is equivalent to energy production.

a) List two suggestions that can be implemented at home to reduce the consumption of electric energy.

b) Explain the term Carbon Footprint.

15. Fleming's Left-Hand Rule and Motor Application

a) State Fleming's Left-Hand Rule.

b) Explain how this rule confirms that the forces experienced on the sides AB and CD of the armature in an electric motor are in opposite directions, causing rotation.

16. A 600 W electric iron and a 500 W grinder each operate for 2 hours daily in a house.

a) What is the total electric energy consumed in Joule (J) per day? (Show steps using $E=Pt$)

b) Calculate the total energy consumed in units (kWh) per day.

17. A step-up transformer has a primary coil of 400 turns and operates at a primary voltage of 230 V. The secondary coil has 4000 turns.

a) Calculate the ratio of the **secondary voltage (V_s)** to the **primary voltage (V_p)**.

b) What is the voltage generated in the secondary coil?

c) Explain the benefit of using this high secondary voltage for long-distance power transmission.

Section-D

Answer any one of the two questions. Each question carries 4 score.

18. A student sets up an experiment as shown

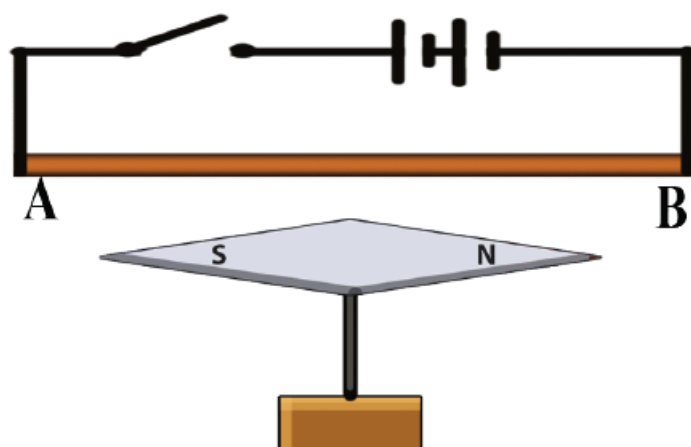


Figure 1

to demonstrate Oersted's discovery. The student then changes the setup to

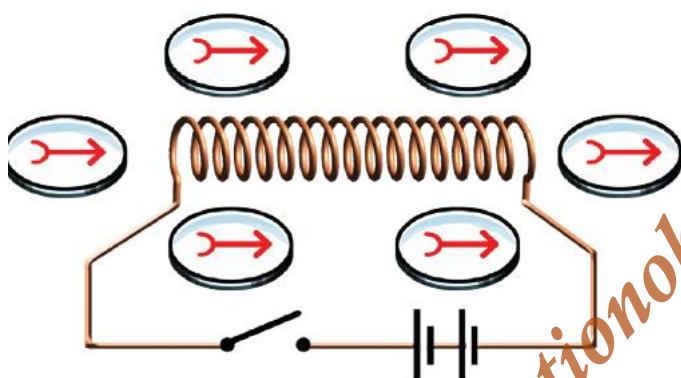


Figure 2

and finally to

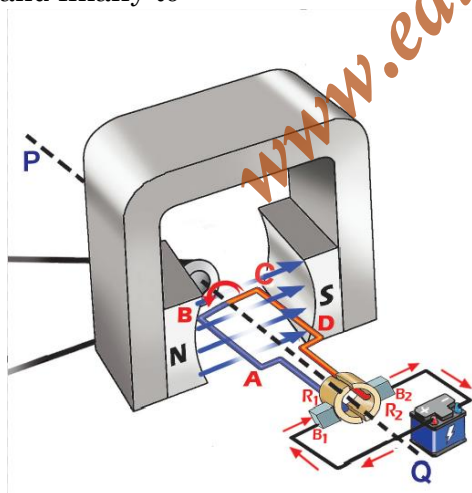


Figure 3

- Identify the magnetic effect of electricity demonstrated in Fig. 1
- How does the phenomenon in Fig. 2 differ from Fig. 1 in terms of field shape and strength control?

c) Fig. 3 (DC Motor) utilizes the Motor Principle. Explain why the use of a soft iron core in the armature, instead of an air core, is crucial for the efficient and continuous rotation of the motor.

d) What mechanism ensures that the armature in Fig. 3 continues to rotate in the same direction?

OR

B. Power stations are vital in meeting large-scale electricity needs. 49

a) What is the common underlying principle (Chapter 6) that enables all three major power stations (Thermal, Nuclear, Hydroelectric) to generate electricity?

b) Briefly explain the energy conversion process and primary source used in a Thermal Power Station and a Hydroelectric Power Station.

c) Relate the Energy Crisis to the concept of TOD billing introduced by KSEB. (Why is high-power consumption during peak hours discouraged?)

d) Give one major advantage of using rooftop Solar Panels over thermal power stations, in terms of environmental impact.

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