GRADE 9 PHYSICS

SMART SYLLABUS TEST SERIES BOARD EXAMINATION 2027

Chapter-wise Tests | Combined Tests | Full Board Model Papers | Answer Keys

Prepared for: Punjab Boards Annual Examination 2027
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PAPER PATTERN & MARKS DISTRIBUTION

Total Marks: 60 Marks | **Time Allowed:** 2 Hours

- **Objective Section:** 12 MCQs (15 Minutes) — 12 Marks
- **Subjective Section:** 1 Hour 45 Minutes — 48 Marks
  - **Q2:** Attempt 5 out of 8 short questions (10 Marks)
  - **Q3:** Attempt 5 out of 8 short questions (10 Marks)
  - **Q4:** Attempt 5 out of 8 short questions (10 Marks)
  - **Q5–Q7:** Detailed Questions (9 Marks each; Attempt any 2)

Important Note: This test series is a practice resource based on the supplied Grade 9 Physics material, the Smart Syllabus exclusions, and the 2027 pairing pattern. Confirm any later board notification before the examination. Deleted topics and excluded exercise items are intentionally avoided where identified.

CHAPTER TEST 1: PHYSICAL QUANTITIES AND MEASUREMENTS

Time: 35 mins | Marks: 20

SECTION A — MCQS (5 MARKS) CHOOSE THE CORRECT OPTION.

1. Which of the following is an SI base quantity?
A. Speed B. Mass C. Force D. Pressure

2. Which is a derived quantity?
A. Time B. Mass C. Volume D. Temperature

3. The prefix kilo represents:
A. 10^{-3} B. 10^{2} C. 10^{3} D. 10

4. Area is measured in:
A. m B. m^2 C. m^3 D. kg

5. The SI unit of length is:
A. Metre B. Kilogram C. Second D. Kelvin

SECTION B — SHORT QUESTIONS (8 MARKS) ATTEMPT ANY FOUR. (2 MARKS EACH)

1. Define a physical quantity and give two examples.
2. Differentiate between base and derived quantities.
3. Write SI units of length, mass, time and temperature.
4. Define density and write its formula.
5. What is meant by a prefix? Give two examples.
6. Differentiate between scalar and vector quantities.

SECTION C — DETAILED QUESTION (7 MARKS) ATTEMPT THE FOLLOWING QUESTION.

1. Explain base and derived physical quantities with suitable examples.

ANSWER KEY / MARKING POINTS
MCQs: 1-B, 2-C, 3-C, 4-B, 5-A
Short answers: Award 2 marks for a correct definition/explanation and relevant equation, unit or example where required.
Detailed answer: Award marks for correct concepts, equations, units, explanation and suitable examples/working.

CHAPTER TEST 2: KINEMATICS

Time: 35 mins | Marks: 20

SECTION A — MCQS (5 MARKS) CHOOSE THE CORRECT OPTION.

1. Displacement is a:
A. Scalar B. Vector C. Base quantity D. Unit

2. The SI unit of acceleration is:
A. m/s B. m/s^2 C. km/h D. N

3. The area under a speed-time graph represents:
A. Force B. Distance travelled C. Power D. Mass

4. Kinematics is the study of:
A. Motion without its causes B. Heat C. Magnetism D. Chemical change

5. Average speed equals:
A. Time/distance B. Total distance/total time C. Force/mass D. Change in velocity/time

SECTION B — SHORT QUESTIONS (8 MARKS) ATTEMPT ANY FOUR. (2 MARKS EACH)

1. Define distance and displacement.
2. Differentiate between speed and velocity.
3. Define acceleration and write its SI unit.
4. What information is obtained from a speed-time graph?
5. A car travels 150 m in 10 s. Find its average speed.
6. A body's velocity changes from 4 m/s to 16 m/s in 3 s. Find acceleration.

SECTION C — DETAILED QUESTION (7 MARKS) ATTEMPT THE FOLLOWING QUESTION.

1. Explain distance and displacement with examples.

ANSWER KEY / MARKING POINTS
MCQs: 1-B, 2-B, 3-B, 4-A, 5-B
Short answers: Award 2 marks for a correct definition/explanation and relevant equation, unit or example where required.
Detailed answer: Award marks for correct concepts, equations, units, explanation and suitable examples/working.

CHAPTER TEST 3: DYNAMICS

Time: 35 mins | Marks: 20

SECTION A — MCQS (5 MARKS) CHOOSE THE CORRECT OPTION.

1. Newton's second law is commonly written as:

A. $F = ma$ B. $P = F/A$ C. $W = mg/h$ D. $v = s/t^2$

2. The SI unit of momentum is:

A. N/m^2 B. kg m/s C. J/s D. kg/m^3

3. The approximate value of g near Earth's surface is:

A. 9.8 m/s^2 B. 98 m/s^2 C. 1.6 m/s^2 D. 0.98 m/s^2

4. The tendency to resist a change in motion is:

A. Pressure B. Inertia C. Power D. Density

5. Momentum is the product of:

A. Mass and velocity B. Force and area C. Work and time D. Mass and volume

SECTION B — SHORT QUESTIONS (8 MARKS) ATTEMPT ANY FOUR. (2 MARKS EACH)

1. Define inertia and give one everyday example.
2. State Newton's first law of motion.
3. Write Newton's second law in equation form and define its symbols.
4. Define momentum and write its SI unit.
5. Differentiate between mass and weight.
6. Calculate force when a 4 kg body accelerates at 3 m/s^2.

SECTION C — DETAILED QUESTION (7 MARKS) ATTEMPT THE FOLLOWING QUESTION.

1. State and explain Newton's three laws of motion.

ANSWER KEY / MARKING POINTS

MCQs: 1-A, 2-B, 3-A, 4-B, 5-A
Short answers: Award 2 marks for a correct definition/explanation and relevant equation, unit or example where required.
Detailed answer: Award marks for correct concepts, equations, units, explanation and suitable examples/working.

CHAPTER TEST 4: TURNING EFFECTS OF FORCE

Time: 35 mins | Marks: 20

SECTION A — MCQS (5 MARKS) CHOOSE THE CORRECT OPTION.

1. Moment of force equals force multiplied by:

A. Time B. Perpendicular distance from pivot C. Mass D. Speed

2. For rotational equilibrium, clockwise moments equal:

A. Weight B. Anticlockwise moments C. Mass D. Acceleration

3. The turning effect of a force is called:

A. Momentum B. Moment of force C. Pressure D. Power

4. The turning point of a lever is called:

A. Load B. Pivot C. Effort D. Beam

5. A force whose line of action passes through the pivot has moment:

A. Zero B. Maximum C. Infinite D. Negative always

SECTION B — SHORT QUESTIONS (8 MARKS) ATTEMPT ANY FOUR. (2 MARKS EACH)

1. Define moment of force and write its formula.
2. What is a pivot? Give one example.
3. State the principle of moments.
4. Why is a door handle fixed far from its hinges?
5. Calculate the moment of a 15 N force acting 0.4 m from a pivot perpendicularly.
6. When is the moment of a force zero?

SECTION C — DETAILED QUESTION (7 MARKS) ATTEMPT THE FOLLOWING QUESTION.

1. Explain the principle of moments with a labelled lever example.

ANSWER KEY / MARKING POINTS

MCQs: 1-B, 2-B, 3-B, 4-B, 5-A
Short answers: Award 2 marks for a correct definition/explanation and relevant equation, unit or example where required.
Detailed answer: Award marks for correct concepts, equations, units, explanation and suitable examples/working.

CHAPTER TEST 5: WORK, ENERGY AND POWER

Time: 35 mins | Marks: 20

SECTION A — MCQS (5 MARKS) CHOOSE THE CORRECT OPTION.

1. Kinetic energy is given by:

A. mgh B. ½ mv^2 C. F/A D. mv

2. One watt is equal to:

A. One joule per second B. One newton metre C. One kg/m^3 D. One pascal

3. The SI unit of work is:

A. Watt B. Joule C. Newton D. Pascal

4. Energy is the ability to do:

A. Pressure B. Work C. Mass D. Density

5. Power is the rate of doing:

A. Work B. Force C. Displacement D. Momentum

SECTION B — SHORT QUESTIONS (8 MARKS) ATTEMPT ANY FOUR. (2 MARKS EACH)

1. Define work and write its SI unit.
2. Define kinetic energy and write its formula.
3. Define gravitational potential energy and write its formula.
4. What is power? Write its SI unit.
5. A 20 N force moves a body 3 m in its direction. Find work done.
6. Find kinetic energy of a 2 kg body moving at 4 m/s.

SECTION C — DETAILED QUESTION (7 MARKS) ATTEMPT THE FOLLOWING QUESTION.

1. Define work, energy and power. Give their SI units and equations.

ANSWER KEY / MARKING POINTS

MCQs: 1-B, 2-A, 3-B, 4-B, 5-A
Short answers: Award 2 marks for a correct definition/explanation and relevant equation, unit or example where required.
Detailed answer: Award marks for correct concepts, equations, units, explanation and suitable examples/working.

CHAPTER TEST 6: MECHANICAL PROPERTIES OF MATTER

Time: 35 mins | Marks: 20

SECTION A — MCQS (5 MARKS) CHOOSE THE CORRECT OPTION.

1. Liquid pressure increases with:

A. Depth B. Colour C. Container material only D. Surface area only

2. The ability of a material to regain its shape is:

A. Plasticity B. Elasticity C. Density D. Pressure

3. The SI unit of pressure is:

A. Joule B. Pascal C. Newton D. Watt

4. For the same force, pressure increases when area:

A. Increases B. Decreases C. Doubles D. Remains infinite

5. A body immersed in a fluid experiences an upward force called:

A. Friction B. Upthrust C. Weight D. Tension

SECTION B — SHORT QUESTIONS (8 MARKS) ATTEMPT ANY FOUR. (2 MARKS EACH)

1. Define elasticity.
2. Define pressure and write its formula.
3. Define density and write its SI unit.
4. Why does liquid pressure increase with depth?
5. A force of 80 N acts on 4 m^2. Find pressure.
6. A body has mass 300 g and volume 100 cm^3. Find density.

SECTION C — DETAILED QUESTION (7 MARKS) ATTEMPT THE FOLLOWING QUESTION.

1. Explain pressure and density, including their equations and SI units.

ANSWER KEY / MARKING POINTS

MCQs: 1-A, 2-B, 3-B, 4-B, 5-B
Short answers: Award 2 marks for a correct definition/explanation and relevant equation, unit or example where required.
Detailed answer: Award marks for correct concepts, equations, units, explanation and suitable examples/working.

CHAPTER TEST 7: THERMAL PROPERTIES OF MATTER

Time: 35 mins | Marks: 20

SECTION A — MCQS (5 MARKS) CHOOSE THE CORRECT OPTION.

1. Specific heat capacity unit is:

A. $J\ kg^{-1}\ K^{-1}$ B. $N\ m^{2}$ C. $kg\ m^{-3}$ D. $W\ m^{-1}$

2. The SI unit of temperature is:

A. Celsius B. Kelvin C. Joule D. Watt

3. Heat is energy transferred due to a difference in:

A. Mass B. Temperature C. Shape D. Density

4. Heat required to change state without temperature change is:

A. Power B. Latent heat C. Momentum D. Pressure

5. Temperature tells how:

A. Hot or cold a body is B. Heavy a body is C. Fast it moves D. Strong a magnet is

SECTION B — SHORT QUESTIONS (8 MARKS) ATTEMPT ANY FOUR. (2 MARKS EACH)

1. Define temperature and state its SI unit.
2. Differentiate between heat and temperature.
3. What is specific heat capacity?
4. Define latent heat.
5. Convert 25°C into kelvin approximately.
6. Why does temperature remain constant during a change of state?

SECTION C — DETAILED QUESTION (7 MARKS) ATTEMPT THE FOLLOWING QUESTION.

1. Differentiate between heat and temperature.

ANSWER KEY / MARKING POINTS

MCQs: 1-A, 2-B, 3-B, 4-B, 5-A
Short answers: Award 2 marks for a correct definition/explanation and relevant equation, unit or example where required.
Detailed answer: Award marks for correct concepts, equations, units, explanation and suitable examples/working.

CHAPTER TEST 8: MAGNETISM

Time: 35 mins | Marks: 20

SECTION A — MCQS (5 MARKS) CHOOSE THE CORRECT OPTION.

1. A magnet has two poles called:

A. Positive and negative B. North and south C. East and west D. Top and bottom

2. Unlike magnetic poles:

A. Repel B. Attract C. Have no effect D. Melt

3. Outside a bar magnet, field lines go from:

A. South to north B. North to south C. East to west D. Centre outward only

4. A compass needle is a small:

A. Battery B. Magnet C. Resistor D. Thermometer

5. Like magnetic poles:

A. Attract B. Repel C. Disappear D. Become neutral

SECTION B — SHORT QUESTIONS (8 MARKS) ATTEMPT ANY FOUR. (2 MARKS EACH)

1. What are magnetic poles?
2. State the law of magnetic poles.
3. What is a magnetic field?
4. Describe the direction of magnetic field lines outside a bar magnet.
5. Why do magnetic field lines never intersect?
6. What is the function of a compass?

SECTION C — DETAILED QUESTION (7 MARKS) ATTEMPT THE FOLLOWING QUESTION.

1. Describe the properties of magnetic poles and the rules of attraction and repulsion.

ANSWER KEY / MARKING POINTS

MCQs: 1-B, 2-B, 3-B, 4-B, 5-B
Short answers: Award 2 marks for a correct definition/explanation and relevant equation, unit or example where required.
Detailed answer: Award marks for correct concepts, equations, units, explanation and suitable examples/working.

CHAPTER TEST 9: NATURE OF SCIENCE

Time: 35 mins | Marks: 20

SECTION A — MCQS (5 MARKS) CHOOSE THE CORRECT OPTION.

1. A testable tentative explanation is a:

A. Law B. Hypothesis C. Unit D. Measurement

2. A scientific theory is:

A. An unsupported guess B. A well-supported explanation C. A personal opinion D. A unit

3. Recording observations is part of:

A. Scientific investigation B. Guessing C. Ignoring results D. Changing data

4. Science is based on:

A. Rumours B. Observation and evidence C. Guesswork only D. Personal likes

5. An experiment is performed to:

A. Test an idea B. Avoid observations C. Prove rumours D. Change facts

SECTION B — SHORT QUESTIONS (8 MARKS) ATTEMPT ANY FOUR. (2 MARKS EACH)

1. What is science?
2. Define hypothesis.
3. Differentiate between scientific theory and scientific law.
4. Why are observations important in science?
5. What is a controlled/fair test?
6. Why should experimental results be recorded?

SECTION C — DETAILED QUESTION (7 MARKS) ATTEMPT THE FOLLOWING QUESTION.

1. Describe the main steps of a scientific investigation.

ANSWER KEY / MARKING POINTS

MCQs: 1-B, 2-B, 3-A, 4-B, 5-A
Short answers: Award 2 marks for a correct definition/explanation and relevant equation, unit or example where required.
Detailed answer: Award marks for correct concepts, equations, units, explanation and suitable examples/working.

COMBINED TEST 1

Time: 2 Hours | Total Marks: 60

Q1. MULTIPLE CHOICE QUESTIONS (12 × 1 = 12 MARKS)

1. The SI unit of density is:

A. kg/m^2 B. kg/m^3 C. N/m^2 D. m/s

2. The area under a speed-time graph represents:

A. Force B. Distance travelled C. Power D. Mass

3. Dynamics deals with motion and its:

A. Causes B. Colour C. Temperature D. Shape only

4. Newton's second law is commonly written as:

A. F = ma B. P = F/A C. W = mg/h D. $v = s/t^2$

5. A force whose line of action passes through the pivot has moment:

A. Zero B. Maximum C. Infinite D. Negative always

6. A 10 N force acts 0.5 m from a pivot at right angles. Moment is:

A. 2 N m B. 5 N m C. 10 N m D. 20 N m

7. The SI unit of work is:

A. Watt B. Joule C. Newton D. Pascal

8. Density is mass per unit:

A. Area B. Volume C. Time D. Length

9. Liquid pressure increases with:

A. Depth B. Colour C. Container material only D. Surface area only

10. Temperature tells how:

A. Hot or cold a body is B. Heavy a body is C. Fast it moves D. Strong a magnet is

11. Unlike magnetic poles:

A. Repel B. Attract C. Have no effect D. Melt

12. A scientific law describes:

A. A pattern in nature B. A personal belief C. Every cause D. A laboratory rule

Q2. SHORT QUESTIONS (10 MARKS) ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Write SI units of length, mass, time and temperature.
2. Define density and write its formula.
3. A car travels 150 m in 10 s. Find its average speed.
4. A body's velocity changes from 4 m/s to 16 m/s in 3 s. Find acceleration.
5. Define inertia and give one everyday example.
6. State Newton's first law of motion.
7. Write Newton's second law in equation form and define its symbols.
8. What information is obtained from a speed-time graph?

Q3. SHORT QUESTIONS (10 MARKS) ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Why is a door handle fixed far from its hinges?
2. Calculate the moment of a 15 N force acting 0.4 m from a pivot perpendicularly.
3. Find kinetic energy of a 2 kg body moving at 4 m/s.
4. Define work and write its SI unit.

COMBINED TEST 1 (CONTINUED) — Section B & C

Q3. SHORT QUESTIONS (CONTINUED)

5. Define pressure and write its formula.
6. Define density and write its SI unit.
7. What is power? Write its SI unit.
8. A force of 80 N acts on 4 m^2. Find pressure.

Q4. SHORT QUESTIONS (10 MARKS) ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Convert 25°C into kelvin approximately.
2. Why does temperature remain constant during a change of state?
3. What are magnetic poles?
4. State the law of magnetic poles.
5. Differentiate between scientific theory and scientific law.
6. Why are observations important in science?
7. Why do magnetic field lines never intersect?
8. Why should experimental results be recorded?

DETAILED QUESTIONS (9 MARKS EACH) ATTEMPT ANY TWO FROM Q5–Q7.

Q5.

(a) Explain base and derived physical quantities with suitable examples. (4)

(b) Define speed, velocity and acceleration. Write their equations and SI units. (5)

Q6.

(a) Explain the principle of moments with a labelled lever example. (4)

(b) Explain kinetic and gravitational potential energy with equations and examples. (5)

Q7.

(a) Differentiate between heat and temperature. (4)

(b) Explain magnetic field lines around a bar magnet and state their main properties. (5)

ANSWER KEY / MARKING GUIDANCE

MCQs: 1-B; 2-B; 3-A; 4-A; 5-A; 6-B; 7-B; 8-B; 9-A; 10-A; 11-B; 12-A

Short & Detailed: Use the chapter-test marking guidance and show complete working for numerical questions. Numerical answers must include units.

COMBINED TEST 2

Time: 2 Hours | Total Marks: 60

Q1. MULTIPLE CHOICE QUESTIONS (12 × 1 = 12 MARKS)

1. The prefix kilo represents:

A. 10^3 B. 10^2 C. 10^3 D. 10

2. A body returning to its starting point has displacement:

A. Zero B. Maximum C. Equal to distance D. Infinite

3. The tendency to resist a change in motion is:

A. Pressure B. Inertia C. Power D. Density

4. Momentum is the product of:

A. Mass and velocity B. Force and area C. Work and time D. Mass and volume

5. For rotational equilibrium, clockwise moments equal:

A. Weight B. Anticlockwise moments C. Mass D. Acceleration

6. The turning effect of a force is called:

A. Momentum B. Moment of force C. Pressure D. Power

7. Work done by a force in its direction is:

A. F × s B. m × v C. F/s D. P/t

8. For the same force, pressure increases when area:

A. Increases B. Decreases C. Doubles D. Remains infinite

9. A body immersed in a fluid experiences an upward force called:

A. Friction B. Upthrust C. Weight D. Tension

10. The SI unit of temperature is:

A. Celsius B. Kelvin C. Joule D. Watt

11. The region around a magnet where magnetic force acts is:

A. Magnetic field B. Electric current C. Thermal zone D. Pressure field

12. Recording observations is part of:

A. Scientific investigation B. Guessing C. Ignoring results D. Changing data

Q2. SHORT QUESTIONS (10 MARKS) ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Define density and write its formula.
2. What is meant by a prefix? Give two examples.
3. A body's velocity changes from 4 m/s to 16 m/s in 3 s. Find acceleration.
4. Define distance and displacement.
5. State Newton's first law of motion.
6. Write Newton's second law in equation form and define its symbols.
7. Define momentum and write its SI unit.
8. A car travels 150 m in 10 s. Find its average speed.

Q3. SHORT QUESTIONS (10 MARKS) ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Calculate the moment of a 15 N force acting 0.4 m from a pivot perpendicularly.
2. When is the moment of a force zero?
3. Define work and write its SI unit.
4. Define kinetic energy and write its formula.

COMBINED TEST 2 (CONTINUED)

Section B & C

Q3. SHORT QUESTIONS (CONTINUED)

5. Define density and write its SI unit.
6. Why does liquid pressure increase with depth?
7. A 20 N force moves a body 3 m in its direction. Find work done.
8. A body has mass 300 g and volume 100 cm^3. Find density.

Q4. SHORT QUESTIONS (10 MARKS) ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Why does temperature remain constant during a change of state?
2. Define temperature and state its SI unit.
3. State the law of magnetic poles.
4. What is a magnetic field?
5. Why are observations important in science?
6. What is a controlled/fair test?
7. What is the function of a compass?
8. What is science?

DETAILED QUESTIONS (9 MARKS EACH) ATTEMPT ANY TWO FROM Q5–Q7.

Q5.

(a) Explain distance and displacement with examples. (4)

(b) Explain momentum and describe the relationship between force and rate of change of momentum. (5)

Q6.

(a) Define work, energy and power. Give their SI units and equations. (4)

(b) Explain how pressure in a liquid changes with depth and state the factors involved. (5)

Q7.

(a) Describe the properties of magnetic poles and the rules of attraction and repulsion. (4)

(b) Explain the meanings of hypothesis, experiment, theory and law. (5)

ANSWER KEY / MARKING GUIDANCE

MCQs: 1-C; 2-A; 3-B; 4-A; 5-B; 6-B; 7-A; 8-B; 9-B; 10-B; 11-A; 12-A

Short & Detailed: Use the chapter-test marking guidance and show complete working for numerical questions. Numerical answers must include units.

COMBINED TEST 3

Time: 2 Hours | Total Marks: 60

Q1. MULTIPLE CHOICE QUESTIONS (12 × 1 = 12 MARKS)

1. The SI unit of force is:
A. Joule B. Newton C. Watt D. Pascal

2. Kinematics is the study of:
A. Motion without its causes B. Heat C. Magnetism D. Chemical change

3. Newton's second law is commonly written as:
A. $F = ma$ B. $P = F/A$ C. $W = mg/h$ D. $v = s/t^2$

4. The SI unit of momentum is:
A. N/m^2 B. kg m/s C. J/s D. kg/m^3

5. A 10 N force acts 0.5 m from a pivot at right angles. Moment is:
A. 2 N m B. 5 N m C. 10 N m D. 20 N m

6. The SI unit of moment of force is:
A. N B. J C. N m D. Pa

7. Energy is the ability to do:
A. Pressure B. Work C. Mass D. Density

8. Liquid pressure increases with:
A. Depth B. Colour C. Container material only D. Surface area only

9. The ability of a material to regain its shape is:
A. Plasticity B. Elasticity C. Density D. Pressure

10. 0°C is approximately equal to:
A. 100 K B. 273 K C. 373 K D. 0 K

11. Outside a bar magnet, field lines go from:
A. South to north B. North to south C. East to west D. Centre outward only

12. A fair test generally changes:
A. All variables B. One variable while controlling others C. No variables D. The result only

Q2. SHORT QUESTIONS (10 MARKS) ATTEMPT ANY FIVE. (2 MARKS EACH)

1. What is meant by a prefix? Give two examples.
2. Differentiate between scalar and vector quantities.
3. Define distance and displacement.
4. Differentiate between speed and velocity.
5. Write Newton's second law in equation form and define its symbols.
6. Define momentum and write its SI unit.
7. Differentiate between mass and weight.
8. A body's velocity changes from 4 m/s to 16 m/s in 3 s. Find acceleration.

Q3. SHORT QUESTIONS (10 MARKS) ATTEMPT ANY FIVE. (2 MARKS EACH)

1. When is the moment of a force zero?
2. Define moment of force and write its formula.
3. Define kinetic energy and write its formula.
4. Define gravitational potential energy and write its formula.

COMBINED TEST 3 (CONTINUED) — Section B & C

Q3. SHORT QUESTIONS (CONTINUED)

5. Why does liquid pressure increase with depth?
6. A force of 80 N acts on 4 m^2. Find pressure.
7. Find kinetic energy of a 2 kg body moving at 4 m/s.
8. Define elasticity.

Q4. SHORT QUESTIONS (10 MARKS) ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Define temperature and state its SI unit.
2. Differentiate between heat and temperature.
3. What is a magnetic field?
4. Describe the direction of magnetic field lines outside a bar magnet.
5. What is a controlled/fair test?
6. Why should experimental results be recorded?
7. What are magnetic poles?
8. Define hypothesis.

DETAILED QUESTIONS (9 MARKS EACH) ATTEMPT ANY TWO FROM Q5–Q7.

Q5.

(a) State and explain Newton's three laws of motion. (4)

(b) Explain how density is defined and show how it is calculated from mass and volume. (5)

Q6.

(a) Explain pressure and density, including their equations and SI units. (4)

(b) Describe how the moment of a force depends on force and perpendicular distance. (5)

Q7.

(a) Describe the main steps of a scientific investigation. (4)

(b) Explain specific heat capacity and latent heat with suitable examples. (5)

ANSWER KEY / MARKING GUIDANCE

MCQs: 1-B; 2-A; 3-A; 4-B; 5-B; 6-C; 7-B; 8-A; 9-B; 10-B; 11-B; 12-B

Short & Detailed: Use the chapter-test marking guidance and show complete working for numerical questions. Numerical answers must include units.

BOARD MODEL PAPER 1

Annual Exam 2027 | 60 Marks

Instructions: Attempt all MCQs. Attempt FIVE questions from each of Q2, Q3 and Q4. Attempt any TWO of Q5, Q6 and Q7. Show complete working in numericals.

Q1. OBJECTIVE (12 MARKS) CHOOSE THE CORRECT OPTION.

1. The prefix kilo represents:
A. 10^3 B. 10^2 C. 10^3 D. 10

2. The area under a speed-time graph represents:
A. Force B. Distance travelled C. Power D. Mass

3. The approximate value of g near Earth's surface is:
A. 9.8 m/s^2 B. 98 m/s^2 C. 1.6 m/s^2 D. 0.98 m/s^2

4. Dynamics deals with motion and its:
A. Causes B. Colour C. Temperature D. Shape only

5. The SI unit of moment of force is:
A. N B. J C. N m D. Pa

6. The turning point of a lever is called:
A. Load B. Pivot C. Effort D. Beam

7. Energy is the ability to do:
A. Pressure B. Work C. Mass D. Density

8. For the same force, pressure increases when area:
A. Increases B. Decreases C. Doubles D. Remains infinite

9. Liquid pressure increases with:
A. Depth B. Colour C. Container material only D. Surface area only

10. Specific heat capacity unit is:
A. J kg^{-1} K^{-1} B. N m^2 C. kg m^{-3} D. W m^{-1}

11. A magnet has two poles called:
A. Positive and negative B. North and south C. East and west D. Top and bottom

12. A testable tentative explanation is a:
A. Law B. Hypothesis C. Unit D. Measurement

Q2. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Define density and write its formula.
2. What is meant by a prefix? Give two examples.
3. A body's velocity changes from 4 m/s to 16 m/s in 3 s. Find acceleration.
4. Define distance and displacement.
5. State Newton's first law of motion.
6. Write Newton's second law in equation form and define its symbols.
7. Define momentum and write its SI unit.
8. A car travels 150 m in 10 s. Find its average speed.

Q3. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Why is a door handle fixed far from its hinges?
2. Calculate the moment of a 15 N force acting 0.4 m from a pivot perpendicularly.

Q3. SHORT QUESTIONS (CONTINUED)

3. Find kinetic energy of a 2 kg body moving at 4 m/s.
4. Define work and write its SI unit.
5. Define pressure and write its formula.
6. Define density and write its SI unit.
7. What is power? Write its SI unit.
8. A force of 80 N acts on 4 m^2. Find pressure.

Q4. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Define latent heat.
2. Convert 25°C into kelvin approximately.
3. What is the function of a compass?
4. What are magnetic poles?
5. Define hypothesis.
6. Differentiate between scientific theory and scientific law.
7. Describe the direction of magnetic field lines outside a bar magnet.
8. What is a controlled/fair test?

DETAILED QUESTIONS (9 MARKS EACH) ATTEMPT ANY TWO FROM Q5–Q7.

Q5. Detailed Question (9 marks)

(a) Explain base and derived physical quantities with suitable examples. (4)

(b) Explain momentum and describe the relationship between force and rate of change of momentum. (5)

Q6. Detailed Question (9 marks)

(a) Explain the principle of moments with a labelled lever example. (4)

(b) Explain how pressure in a liquid changes with depth and state the factors involved. (5)

Q7. Detailed Question (9 marks)

(a) Differentiate between heat and temperature. (4)

(b) Explain the meanings of hypothesis, experiment, theory and law. (5)

MCQ ANSWER KEY

1-C; 2-B; 3-A; 4-A; 5-C; 6-B; 7-B; 8-B; 9-A; 10-A; 11-B; 12-B

BOARD MODEL PAPER 2

Annual Exam 2027 | 60 Marks

Instructions: Attempt all MCQs. Attempt FIVE questions from each of Q2, Q3 and Q4. Attempt any TWO of Q5, Q6 and Q7. Show complete working in numericals.

Q1. OBJECTIVE (12 MARKS) CHOOSE THE CORRECT OPTION.

1. Which of the following is an SI base quantity?
A. Speed B. Mass C. Force D. Pressure

2. Displacement is a:
A. Scalar B. Vector C. Base quantity D. Unit

3. Newton's second law is commonly written as:
A. $F = ma$ B. $P = F/A$ C. $W = mg/h$ D. $v = s/t^2$

4. Momentum is the product of:
A. Mass and velocity B. Force and area C. Work and time D. Mass and volume

5. A force whose line of action passes through the pivot has moment:
A. Zero B. Maximum C. Infinite D. Negative always

6. For rotational equilibrium, clockwise moments equal:
A. Weight B. Anticlockwise moments C. Mass D. Acceleration

7. One watt is equal to:
A. One joule per second B. One newton metre C. One kg/m^3 D. One pascal

8. The ability of a material to regain its shape is:
A. Plasticity B. Elasticity C. Density D. Pressure

9. Pressure is defined as:
A. Force/area B. Area/force C. Mass/volume D. Force × area

10. 0°C is approximately equal to:
A. 100 K B. 273 K C. 373 K D. 0 K

11. The region around a magnet where magnetic force acts is:
A. Magnetic field B. Electric current C. Thermal zone D. Pressure field

12. A scientific law describes:
A. A pattern in nature B. A personal belief C. Every cause D. A laboratory rule

Q2. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Differentiate between scalar and vector quantities.
2. Define a physical quantity and give two examples.
3. Differentiate between speed and velocity.
4. Define acceleration and write its SI unit.
5. Define momentum and write its SI unit.
6. Differentiate between mass and weight.
7. Calculate force when a 4 kg body accelerates at 3 m/s^2.
8. Define distance and displacement.

Q3. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. When is the moment of a force zero?
2. Define moment of force and write its formula.

Q3. SHORT QUESTIONS (CONTINUED)

3. Define kinetic energy and write its formula.
4. Define gravitational potential energy and write its formula.
5. Why does liquid pressure increase with depth?
6. A force of 80 N acts on 4 m^2. Find pressure.
7. Find kinetic energy of a 2 kg body moving at 4 m/s.
8. Define elasticity.

Q4. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Why does temperature remain constant during a change of state?
2. Define temperature and state its SI unit.
3. State the law of magnetic poles.
4. What is a magnetic field?
5. Why are observations important in science?
6. What is a controlled/fair test?
7. What is the function of a compass?
8. What is science?

DETAILED QUESTIONS (9 MARKS EACH) ATTEMPT ANY TWO FROM Q5–Q7.

Q5. Detailed Question (9 marks)

(a) Explain how density is defined and show how it is calculated from mass and volume. (4)

(b) State and explain Newton's three laws of motion. (5)

Q6. Detailed Question (9 marks)

(a) Describe how the moment of a force depends on force and perpendicular distance. (4)

(b) Explain pressure and density, including their equations and SI units. (5)

Q7. Detailed Question (9 marks)

(a) Explain specific heat capacity and latent heat with suitable examples. (4)

(b) Describe the main steps of a scientific investigation. (5)

MCQ ANSWER KEY

1-B; 2-B; 3-A; 4-A; 5-A; 6-B; 7-A; 8-B; 9-A; 10-B; 11-A; 12-A

BOARD MODEL PAPER 3

Annual Exam 2027 | 60 Marks

Instructions: Attempt all MCQs. Attempt FIVE questions from each of Q2, Q3 and Q4. Attempt any TWO of Q5, Q6 and Q7. Show complete working in numericals.

Q1. OBJECTIVE (12 MARKS) CHOOSE THE CORRECT OPTION.

1. The SI unit of density is:
A. kg/m^2 B. kg/m^3 C. N/m^2 D. m/s

2. Velocity is speed with:
A. Mass B. Direction C. Temperature D. Pressure

3. Weight is the gravitational:
A. Mass B. Force C. Volume D. Density

4. The approximate value of g near Earth's surface is:
A. 9.8 m/s^2 B. 98 m/s^2 C. 1.6 m/s^2 D. 0.98 m/s^2

5. The turning effect of a force is called:
A. Momentum B. Moment of force C. Pressure D. Power

6. The SI unit of moment of force is:
A. N B. J C. N m D. Pa

7. Work done by a force in its direction is:
A. F × s B. m × v C. F/s D. P/t

8. Density is mass per unit:
A. Area B. Volume C. Time D. Length

9. For the same force, pressure increases when area:
A. Increases B. Decreases C. Doubles D. Remains infinite

10. Heat required to change state without temperature change is:
A. Power B. Latent heat C. Momentum D. Pressure

11. A compass needle is a small:
A. Battery B. Magnet C. Resistor D. Thermometer

12. Science is based on:
A. Rumours B. Observation and evidence C. Guesswork only D. Personal likes

Q2. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Differentiate between base and derived quantities.
2. Write SI units of length, mass, time and temperature.
3. What information is obtained from a speed-time graph?
4. A car travels 150 m in 10 s. Find its average speed.
5. Calculate force when a 4 kg body accelerates at 3 m/s^2.
6. Define inertia and give one everyday example.
7. State Newton's first law of motion.
8. Define acceleration and write its SI unit.

Q3. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. What is a pivot? Give one example.
2. State the principle of moments.

Q3. SHORT QUESTIONS (CONTINUED)

3. What is power? Write its SI unit.
4. A 20 N force moves a body 3 m in its direction. Find work done.
5. A body has mass 300 g and volume 100 cm^3. Find density.
6. Define elasticity.
7. Define kinetic energy and write its formula.
8. Define density and write its SI unit.

Q4. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Differentiate between heat and temperature.
2. What is specific heat capacity?
3. Describe the direction of magnetic field lines outside a bar magnet.
4. Why do magnetic field lines never intersect?
5. Why should experimental results be recorded?
6. What is science?
7. State the law of magnetic poles.
8. Differentiate between scientific theory and scientific law.

DETAILED QUESTIONS (9 MARKS EACH) ATTEMPT ANY TWO FROM Q5–Q7.

Q5. Detailed Question (9 marks)

(a) Explain base and derived physical quantities with suitable examples. (4)

(b) Explain momentum and describe the relationship between force and rate of change of momentum. (5)

Q6. Detailed Question (9 marks)

(a) Explain the principle of moments with a labelled lever example. (4)

(b) Explain how pressure in a liquid changes with depth and state the factors involved. (5)

Q7. Detailed Question (9 marks)

(a) Differentiate between heat and temperature. (4)

(b) Explain the meanings of hypothesis, experiment, theory and law. (5)

MCQ ANSWER KEY

1-B; 2-B; 3-B; 4-A; 5-B; 6-C; 7-A; 8-B; 9-B; 10-B; 11-B; 12-B

BOARD MODEL PAPER 4

Annual Exam 2027 | 60 Marks

Instructions: Attempt all MCQs. Attempt FIVE questions from each of Q2, Q3 and Q4. Attempt any TWO of Q5, Q6 and Q7. Show complete working in numericals.

Q1. OBJECTIVE (12 MARKS) CHOOSE THE CORRECT OPTION.

1. Area is measured in:
A. m B. m^2 C. m^3 D. kg

2. Kinematics is the study of:
A. Motion without its causes B. Heat C. Magnetism D. Chemical change

3. The tendency to resist a change in motion is:
A. Pressure B. Inertia C. Power D. Density

4. Newton's second law is commonly written as:
A. F = ma B. P = F/A C. W = mg/h D. $v = s/t^2$

5. Moment of force equals force multiplied by:
A. Time B. Perpendicular distance from pivot C. Mass D. Speed

6. A force whose line of action passes through the pivot has moment:
A. Zero B. Maximum C. Infinite D. Negative always

7. Power is the rate of doing:
A. Work B. Force C. Displacement D. Momentum

8. A body immersed in a fluid experiences an upward force called:
A. Friction B. Upthrust C. Weight D. Tension

9. The ability of a material to regain its shape is:
A. Plasticity B. Elasticity C. Density D. Pressure

10. The SI unit of temperature is:
A. Celsius B. Kelvin C. Joule D. Watt

11. Unlike magnetic poles:
A. Repel B. Attract C. Have no effect D. Melt

12. A scientific theory is:
A. An unsupported guess B. A well-supported explanation C. A personal opinion D. A unit

Q2. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Define density and write its formula.
2. What is meant by a prefix? Give two examples.
3. A body's velocity changes from 4 m/s to 16 m/s in 3 s. Find acceleration.
4. Define distance and displacement.
5. State Newton's first law of motion.
6. Write Newton's second law in equation form and define its symbols.
7. Define momentum and write its SI unit.
8. A car travels 150 m in 10 s. Find its average speed.

Q3. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Why is a door handle fixed far from its hinges?
2. Calculate the moment of a 15 N force acting 0.4 m from a pivot perpendicularly.

Q3. SHORT QUESTIONS (CONTINUED)

3. Find kinetic energy of a 2 kg body moving at 4 m/s.
4. Define work and write its SI unit.
5. Define pressure and write its formula.
6. Define density and write its SI unit.
7. What is power? Write its SI unit.
8. A force of 80 N acts on 4 m^2. Find pressure.

Q4. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Define latent heat.
2. Convert 25°C into kelvin approximately.
3. What is the function of a compass?
4. What are magnetic poles?
5. Define hypothesis.
6. Differentiate between scientific theory and scientific law.
7. Describe the direction of magnetic field lines outside a bar magnet.
8. What is a controlled/fair test?

DETAILED QUESTIONS (9 MARKS EACH) ATTEMPT ANY TWO FROM Q5–Q7.

Q5. Detailed Question (9 marks)

(a) Explain how density is defined and show how it is calculated from mass and volume. (4)

(b) State and explain Newton's three laws of motion. (5)

Q6. Detailed Question (9 marks)

(a) Describe how the moment of a force depends on force and perpendicular distance. (4)

(b) Explain pressure and density, including their equations and SI units. (5)

Q7. Detailed Question (9 marks)

(a) Explain specific heat capacity and latent heat with suitable examples. (4)

(b) Describe the main steps of a scientific investigation. (5)

MCQ ANSWER KEY

1-B; 2-A; 3-B; 4-A; 5-B; 6-A; 7-A; 8-B; 9-B; 10-B; 11-B; 12-B

BOARD MODEL PAPER 5

Annual Exam 2027 | 60 Marks

Instructions: Attempt all MCQs. Attempt FIVE questions from each of Q2, Q3 and Q4. Attempt any TWO of Q5, Q6 and Q7. Show complete working in numericals.

Q1. OBJECTIVE (12 MARKS) CHOOSE THE CORRECT OPTION.

1. Which is a derived quantity?
A. Time B. Mass C. Volume D. Temperature

2. The SI unit of acceleration is:
A. m/s B. m/s^2 C. km/h D. N

3. The SI unit of momentum is:
A. N/m^2 B. kg m/s C. J/s D. kg/m^3

4. Weight is the gravitational:
A. Mass B. Force C. Volume D. Density

5. A 10 N force acts 0.5 m from a pivot at right angles. Moment is:
A. 2 N m B. 5 N m C. 10 N m D. 20 N m

6. The turning effect of a force is called:
A. Momentum B. Moment of force C. Pressure D. Power

7. The SI unit of work is:
A. Watt B. Joule C. Newton D. Pascal

8. The SI unit of pressure is:
A. Joule B. Pascal C. Newton D. Watt

9. Density is mass per unit:
A. Area B. Volume C. Time D. Length

10. The SI unit of heat energy is:
A. Joule B. Kelvin C. Pascal D. Watt

11. Magnetic field lines never:
A. Have direction B. Intersect one another C. Form curves D. Pass through space

12. A fair test generally changes:
A. All variables B. One variable while controlling others C. No variables D. The result only

Q2. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Differentiate between scalar and vector quantities.
2. Define a physical quantity and give two examples.
3. Differentiate between speed and velocity.
4. Define acceleration and write its SI unit.
5. Define momentum and write its SI unit.
6. Differentiate between mass and weight.
7. Calculate force when a 4 kg body accelerates at 3 m/s^2.
8. Define distance and displacement.

Q3. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. When is the moment of a force zero?
2. Define moment of force and write its formula.

Q3. SHORT QUESTIONS (CONTINUED)

3. Define kinetic energy and write its formula.
4. Define gravitational potential energy and write its formula.
5. Why does liquid pressure increase with depth?
6. A force of 80 N acts on 4 m^2. Find pressure.
7. Find kinetic energy of a 2 kg body moving at 4 m/s.
8. Define elasticity.

Q4. SHORT QUESTIONS (10 MARKS) - ATTEMPT ANY FIVE. (2 MARKS EACH)

1. Why does temperature remain constant during a change of state?
2. Define temperature and state its SI unit.
3. State the law of magnetic poles.
4. What is a magnetic field?
5. Why are observations important in science?
6. What is a controlled/fair test?
7. What is the function of a compass?
8. What is science?

DETAILED QUESTIONS (9 MARKS EACH) ATTEMPT ANY TWO FROM Q5–Q7.

Q5. Detailed Question (9 marks)

(a) Explain base and derived physical quantities with suitable examples. (4)

(b) Explain momentum and describe the relationship between force and rate of change of momentum. (5)

Q6. Detailed Question (9 marks)

(a) Explain the principle of moments with a labelled lever example. (4)

(b) Explain how pressure in a liquid changes with depth and state the factors involved. (5)

Q7. Detailed Question (9 marks)

(a) Differentiate between heat and temperature. (4)

(b) Explain the meanings of hypothesis, experiment, theory and law. (5)

MCQ ANSWER KEY

1-C; 2-B; 3-B; 4-B; 5-B; 6-B; 7-B; 8-B; 9-B; 10-A; 11-B; 12-B

FORMULA & NUMERICAL REVISION SHEET

Quick Reference Guide

CORE EQUATIONS TO REVISE

Quantity	Equation	SI Unit
Density	$\rho = m / V$	kg m^{-3}
Average speed	v = total distance / total time	m s^{-1}
Acceleration	$a = (v - u) / t$	m s^{-2}
Newton's second law	$F = ma$	N
Weight	$W = mg$	N
Momentum	$p = mv$	kg m s^{-1}
Moment of force	Moment = F × perpendicular distance	N m
Work	W = F × s (force along displacement)	J
Kinetic energy	$KE = ½ mv^2$	J
Gravitational potential energy	$GPE = mgh$	J
Power	$P = W / t$	W
Pressure	$P = F / A$	Pa
Specific heat capacity	$Q = mc \Delta T$	J kg^{-1} K^{-1}
Celsius to kelvin	$T(K) = \theta(°C) + 273$	K

WORKED EXAMPLES

1. A car covers 150 m in 10 s. **Speed = distance / time = 150 / 10 = 15 m/s.**
2. Velocity changes from 4 m/s to 16 m/s in 3 s. **Acceleration = (v − u) / t = (16 − 4) / 3 = 4 m/s^2.**
3. A 4 kg body accelerates at 3 m/s^2. **Force = ma = 4 × 3 = 12 N.**
4. A 15 N force acts 0.4 m from a pivot perpendicularly. **Moment = F × d = 15 × 0.4 = 6 N m.**
5. A 20 N force moves an object 3 m in its direction. **Work = Fs = 20 × 3 = 60 J.**
6. A 2 kg body moves at 4 m/s. **KE = ½ mv^2 = 0.5 × 2 × 16 = 16 J.**
7. An 80 N force acts on 4 m^2. **Pressure = F / A = 80 / 4 = 20 Pa.**
8. A body has mass 300 g and volume 100 cm^3. **Density = 300 / 100 = 3 g/cm^3.**
9. Convert 25°C to kelvin: **T = 25 + 273 = 298 K.**

Syllabus Boundary Note: The test series is designed around the identified 2026-27 Smart Syllabus/ALP exclusions. It does not claim that every textbook line or every board-issued correction has been independently rechecked. If PEC/BISE issues a later revised notification, that notification takes precedence.