Physical Science: Physics

Original exam A, full-length form B and three-week preparation

Why these demands were selected

The single public form included pendulum motion, heat exchange, helmet design, cell-phone optics and voice recognition. It had ten clusters, 31 selected responses and 19 constructed responses. Nine clusters contained an explicit diagram cue.

Only June 2026 is available in the corpus. The August schedule supplied no same-design form. January will be the first winter test, so all month comparisons are unestimated.

Released forecast example **State design / administration guidance**

Original exam A

Four sets, 8 multiple-choice and 4 written responses. Suggested time: 35–50 min; adjust to local conditions. Each selected response earns one local point. Each written response earns one point when the required components are present. Maximum 12 local points. Accept defensible alternative reasoning. Allow consistent follow-through where the local criterion assesses a new operation; annotate the originating error.

Full-length form B

Use the intact linked 2026-06 official booklet except 20. The insert preserves one response position and its maximum credit. Report the original-component subtotal and replacement result separately. State conversion charts are specific to the unmodified state form. Record prior exposure if students have used the released booklet in preparation.

Preparation and feedback

Use the six Studio sessions, then one new retrieval check per week. Use Form A as an independent transfer check after preparation. Form B is optional for full-length rehearsal. On return after absence, students can start with the re-entry line on the current week’s sheet. After testing, return to the first unsupported step in the student’s reasoning.

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Questions 1–6 • One point per selected response.

1 B • Impulse
Force integrated over time gives impulse in N·s.

2 A • X only
X peaks at 150 N and Y peaks at 300 N.

3 Written response / 1 local point
• Each triangular area is ½ × peak × duration = 9 N·s.
• The longer contact spreads the same impulse over more time. Equal impulse gives equal momentum change even with different peaks.

4 C • 1.50 W
6.0 × 0.25 = 1.50 W.

5 D • Time switched on
Energy equals input power multiplied by operating time.

6 Written response / 1 local point
• A is 0.48/2.40 = 20%; B is 0.45/1.50 = 30%.
• B converts a larger fraction of input to useful light even though A emits slightly more light power.

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Questions 7–12 • One point per selected response.

7 C • 4 m
λ = 24/6 = 4 m.

8 A • Increase the driver’s displacement per oscillation
Larger driving displacement can produce a larger disturbance at the same cycle rate.

9 Written response / 1 local point
• At 8 Hz, λ = 24/8 = 3 m.
• Crests are generated more frequently and travel the same speed, so consecutive crests are closer together.

10 B • 18 cm from the lens on the opposite side
$1/d_i = 1/12 - 1/36 = 1/18$.

11 D • A screen placed at its location captures a focused image.
Converging rays can form the image on a screen.

12 Written response / 1 local point
• The magnitude of magnification is 18/36 = 0.5, giving a 1.5 cm inverted image.
• One parallel ray refracts through the far focus and a central ray travels approximately straight; their intersection below the axis locates the image tip.

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Replacement scoring and retrieval-check keys

Form B replacement / 20 / 1 credits maximum

Award one local point for P with supporting evidence: F = ma yields 45 N in P and 65 N in Q, so only P is below 55 N. Accept an equivalent comparison to the acceleration threshold of 110 m/s².

Public scoring materials for base form

Week 1 / retrieval check

Compare a 4 N rectangular pulse lasting 3 s with a 6 N pulse lasting 2 s.
Both deliver 12 N·s despite different peak forces.

Week 2 / retrieval check

A wave travels at 30 m/s with a frequency of 10 Hz. Predict wavelength if frequency doubles at the same speed.
It decreases from 3 m to 1.5 m because v=fλ.

Week 3 / retrieval check

Two devices have the same output of 0.6 W but inputs of 2 W and 3 W. Compare efficiencies.
30% and 20%; the 2 W device is more efficient at that output.

Department follow-up

PHYS_NEW-C1 Represent a force with direction and magnitude
If the object is moving one way, must its acceleration point that way? Which direction does the net force indicate here?

PHYS_NEW-C2 Select the design using the relevant peak
Which table entry establishes the smallest maximum acceleration? How does that relate to force for the same mass?

PHYS_NEW-C3 Construct the image with rays
Which two rays determine the tip of the image? Where should they cross?

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Use the independent exam only after practice, or document the order if using it diagnostically.

Which preparation sessions lead into each exam set?

A1 · Protecting a sensor / Studio session(s) 1,6

A2 · Powering the light / Studio session(s) 5

A3 · Signals on a string / Studio session(s) 3

A4 · Lens on an inspection stand / Studio session(s) 4

Likely reading of a partial response to investigate

A design is chosen by peak without checking duration. Ask which quantity the area measures and which the height measures.

Bridge rehearsal / worked feedback

An ideal 4 W device is used for 15 s. Only 12 J becomes useful light. Find input energy and efficiency.

60 J input; efficiency 12/60 = 20%. Power and energy require different units.

How to choose the next round

If the model or source was misread, return to the matching prep set and ask for a new representation. If the computation or claim is correct but support is missing, request one neutral explanation and give a parallel independent check. Keep the independent result separate from prompted work.