PHYSICS · Mark scheme and worked solutions

PHYSICS Practice Paper 1

Use this to check your own answers. Self-marking is a great way to learn, but it doesn't update SubjectCover progress: to have your answers marked and your coverage tracked, take the paper in a free account.

Question 1

[4 marks]

ANSWER

(a) 0.004 m²

(b) Pressure = 0.2 kg × 10 N/kg / 0.004 m² = 500 Pa · must show p = F / A

(c) pascal

Common mistakes: not converting cm² to m²; using mass instead of weight (force)

MARKING POINTS

M1 (a) · 1 mark · Converts cm to m, finds area as length × width.

M2 (b) · 1 mark · Writes and/or uses correct equation for pressure (p = F/A or p = W/A).

A1 (b) · 1 mark · Substitutes values correctly, calculates pressure as 500 Pa (accept values 495–505 Pa). (follow-through)

B1 (c) · 1 mark · Gives correct SI unit (pascal or Pa).

WORKED SOLUTION

(a) Convert length and width to metres: 8.0 cm = 0.08 m, 5.0 cm = 0.05 m

$$A = 0.08 \times 0.05 = 0.004\,\text{m}^2$$

(b) Pressure equation: $p = \frac{F}{A}$

Mass = 200 g = 0.2 kg. Weight (force) = $0.2 \times 10 = 2$ N

$$p = \frac{2}{0.004} = 500\,\text{Pa}$$

(c) The SI unit for pressure is the pascal (Pa).

Question 2

[3 marks]

ANSWER

(a) 0.5 A

(b) V = I × R

Common mistakes: Reversing V and I in V=IR

MARKING POINTS

M1 (a) · 1 mark · Uses I = V / R or V = I × R correctly rearranged.

A1 (a) · 1 mark · Calculates correct current: 0.5 A. (follow-through)

B1 (b) · 1 mark · States correct formula: V = I × R (or I = V / R).

WORKED SOLUTION

a) I = V / R = 6 V / 12 Ω = 0.5 A

b) The equation is V = I × R.

Question 3

[4 marks]

ANSWER

(a) Jupiter

(b) 240 N · must show Correct formula used (weight = mass × gravitational field strength)

(c) Jupiter has a larger gravitational field strength than Earth, so the same object experiences a greater force (weight) on Jupiter. · must show Greater gravitational field strength, Weight depends on gravitational field strength

Common mistakes: Confusing mass and weight; Not using correct gravitational field strength

MARKING POINTS

B1 (a) · 1 mark · Correctly identifies Jupiter as having the strongest gravitational field strength.

M1 (b) · 1 mark · Uses weight = mass × gravitational field strength.

A1 (b) · 1 mark · Correct answer: 240 N with correct unit.

B2 (c) · 1 mark · Explains weight is greater because gravitational field strength is higher on Jupiter.

WORKED SOLUTION

a) Jupiter has the greatest gravitational field strength (23 N/kg).

b) Weight = mass × gravitational field strength

$$W = 60\ \text{kg} \times 4\ \text{N/kg} = 240\ \text{N}$$

c) Jupiter's gravitational field strength is higher than Earth's, so an object weighs more on Jupiter.

Question 4

[4 marks]

ANSWER

(a) Both are nuclear reactions and both release large amounts of energy. · must show nuclear reactions, energy release

(b) Fission splits large/heavy nuclei into smaller nuclei, but fusion joins small/light nuclei to form a bigger nucleus. · must show fission splits heavy nuclei, fusion joins light nuclei

Must show: similarities: both involve nuclear reactions, both release energy, difference: fission splits heavy nuclei, fusion joins light nuclei

MARKING POINTS

B1 (a) · 1 mark · States first valid similarity (e.g., both are nuclear reactions).

B2 (a) · 1 mark · States second valid similarity (e.g., both release energy).

B3 (b) · 2 marks · Describes a difference: fission splits heavy nuclei; fusion joins light nuclei (both features must be given for 2 marks, 1 for one side).

WORKED SOLUTION

a) Both fission and fusion are nuclear reactions. Both processes release large amounts of energy.

b) Fission splits a heavy nucleus into two lighter ones. Fusion joins two light nuclei to make a heavier nucleus.

Question 5

[4 marks]

ANSWER

(a) Refraction is the bending of a wave as it passes from one medium to another.

(b) Arrow drawn showing ray bending towards the normal inside glass. · must show Ray inside bends towards normal

(c) The ray slows down in glass (denser medium), causing it to bend towards the normal.

Must show: Refracted ray correctly shown closer to normal inside the glass block

Common mistakes: Ray not drawn bending correctly; Confusing refraction with reflection

MARKING POINTS

B1 (a) · 1 mark · Defines refraction correctly as bending of waves at a boundary.

B2 (b) · 1 mark · Draws arrow on diagram showing refracted ray bending towards the normal.

B3 (c) · 1 mark · States that the ray slows down in glass/more optically dense medium.

B4 (c) · 1 mark · Links slowing down to bending towards the normal.

WORKED SOLUTION

a) Refraction is the bending of a wave when it passes from one medium to another.

b) The refracted ray inside the glass should be drawn at a smaller angle to the normal than the incident ray (bends towards the normal).

c) The light ray bends towards the normal because it slows down as it enters the denser glass from air.

Question 6

[4 marks]

ANSWER

(a) Amplitude: the maximum displacement from the equilibrium position. Wavelength: the distance between two corresponding points on adjacent waves (e.g., crest to crest).

(b) It slows down.

(c) Hertz (Hz), second (s), or metre/second (m/s)

MARKING POINTS

B1 (a) · 1 mark · Amplitude described as the maximum displacement from equilibrium position.

B1 (a) · 1 mark · Wavelength described as the distance between two identical points on adjacent waves.

B1 (b) · 1 mark · Correctly states that light slows down when entering glass from air.

B1 (c) · 1 mark · Gives a correct unit (hertz, second, or metre/second).

WORKED SOLUTION

a) The amplitude of a wave is the maximum distance a particle moves from its normal/rest position. The wavelength is the distance from one crest to the next crest (or between two identical points on neighbouring waves).

b) When light goes from air into glass, it slows down.

c) Possible units include hertz (Hz), second (s), or metre/second (m/s).

Question 7

[1 mark]

ANSWER

Distance

Also accept: distance; amplitude; path length

Common mistakes: frequency

MARKING POINTS

B1 · 1 mark · Names a physical quantity relevant to waves, other than wavelength, that is measured in metres (e.g. distance, amplitude, path length).

WORKED SOLUTION

Amplitude (height of the wave) is also measured in metres.

Question 8

[1 mark]

ANSWER

The paper is attracted to the balloon because a charge is induced on the paper.

Also accept: The balloon induces opposite charges on the surface of the paper, so they attract.; Electrons in the paper are repelled, causing attraction to the balloon.

Common mistakes: Both objects become negatively charged and repel.; Nothing happens

MARKING POINTS

B1 · 1 mark · Describes correctly that the pieces of paper are attracted because charge is induced on them.

WORKED SOLUTION

A negatively charged balloon induces a positive charge on the side of the paper closest to it, causing the paper to be attracted.

Question 9

[1 mark]

ANSWER

Correct option: Infrared radiation can travel through a vacuum.

Common mistakes: Selecting 'Infrared radiation cannot travel through air.'; Selecting 'Infrared radiation is only present in sunlight.'; Selecting 'Infrared radiation is visible to the human eye.'

MARKING POINTS

B1 · 1 mark · Correctly selects that infrared radiation can travel through a vacuum.

WORKED SOLUTION

Like all electromagnetic waves, infrared radiation can travel through a vacuum.

Question 10

[1 mark]

ANSWER

produces pollution

Also accept: produces pollution; releases greenhouse gases; contributes to air pollution; emits carbon dioxide

Common mistakes: wood cannot be replaced; wood is expensive

MARKING POINTS

B1 · 1 mark · Any clear disadvantage of burning wood (e.g., produces pollution, releases greenhouse gases, contributes to air pollution).

WORKED SOLUTION

Burning wood produces pollution.

Question 11

[2 marks]

ANSWER

They all have the same type of electric charge, so they repel each other due to electrostatic repulsion.

Also accept: Each paint drop gets the same charge and like charges repel.

Common mistakes: Saying gravity causes the droplets to spread.; Not mentioning the charge.

MARKING POINTS

B1 · 1 mark · States the droplets all have the same charge.

B2 · 1 mark · Mentions that like charges repel (electrostatic repulsion).

WORKED SOLUTION

Each droplet is given the same charge as it leaves the spray gun. Like charges repel each other, so the droplets spread out.

Question 12

[4 marks]

ANSWER

(a) Weight = mass × gravitational field strength

(b) Mars: 2000 N, Jupiter: 11500 N

(c) Jupiter has a much larger mass than Mars, so its gravitational field strength is much higher, making each kilogram weigh more.

MARKING POINTS

B1 (a) · 1 mark · Correctly writes formula for weight as weight = mass × gravitational field strength (or W = m × g).

M1 (b) · 1 mark · Correct calculation for one planet (500 × 4 = 2000 N for Mars or 500 × 23 = 11500 N for Jupiter). (follow-through)

A1 (b) · 1 mark · Correct calculation for both planets. (follow-through)

B2 (c) · 1 mark · Correct explanation that larger mass of Jupiter means a larger gravitational field strength.

WORKED SOLUTION

a) Weight = mass × gravitational field strength (W = m × g)

b) Mars: 500 kg × 4 N/kg = 2000 N; Jupiter: 500 kg × 23 N/kg = 11500 N

c) Jupiter is much more massive than Mars, so its gravitational field is stronger and objects are heavier on its surface.

Question 13

[5 marks]

ANSWER

(a) Energy

(b) 50%

(c) Wrap the pipes with insulation (or lagging) to reduce heat loss by conduction and convection.

Common mistakes: Using wrong value for useful energy output; Not dividing by total energy supplied

MARKING POINTS

B1 (a) · 1 mark · States 'energy' as the quantity measured in joules.

M1 (b) · 1 mark · Correctly identifies and uses useful energy (900 J / 1800 J).

A1 (b) · 1 mark · Gives answer as 50% (accept 49–51% for rounding).

B2 (c) · 2 marks · One mark for identifying lagging/insulation; one mark for stating it reduces loss by conduction/convection.

WORKED SOLUTION

a) The joule (J) is the SI unit of energy.

b) Efficiency = (useful energy output / total energy input) × 100%

$$Efficiency = \frac{900}{1800} \times 100\% = 50\%$$

c) Heat loss from the pipes can be reduced by insulating them. Adding lagging around the pipes reduces heat loss by conduction and convection to the surroundings.

Question 14

[4 marks]

ANSWER

(a) n = sin(38°)/sin(24°) = 0.6157/0.4067 ≈ 1.51

(b) When entering the glass, the light bends towards the normal (slows down); when leaving the glass to air, it bends away from the normal (speeds up).

Common mistakes: Incorrect application of formula; Not identifying direction change

MARKING POINTS

B1 (a) · 1 mark · Substitutes into n = sin(i)/sin(r)

B2 (a) · 1 mark · Correct calculation to 2 dp (accept 1.50–1.52)

B3 (b) · 1 mark · Explains bending towards the normal on entering (slowing down)

B4 (b) · 1 mark · Explains bending away from the normal on leaving (speeding up)

WORKED SOLUTION

a) n = sin(38°)/sin(24°) = 0.6157/0.4067 ≈ 1.51

b) The ray bends towards the normal when it enters the slower medium (glass) and away from the normal when it exits glass into air.

Question 15

[5 marks]

ANSWER

(a) 0.70 m/s^2 · must show a = (v-u)/t

(b) 1.1 N · must show F=ma with calculated a

(c) Velocity–time graph shows acceleration (gradient); distance–time graph shows speed (gradient) and not acceleration directly. · must show One reference to what is shown by each graph

Common mistakes: Using wrong gradient for acceleration; Not converting time units; Misapplying F=ma

MARKING POINTS

M1 (a) · 1 mark · Correctly substitutes v, u, and t into the acceleration formula.

A1 (a) · 1 mark · Correct acceleration calculation to 2 sig. fig.

M2 (b) · 1 mark · Uses F=ma with calculated acceleration and correct mass. (follow-through)

A2 (b) · 1 mark · Evaluates force to 2 sig. fig. (follow-through)

B1 (c) · 1 mark · States two differences correctly between the two graph types.

WORKED SOLUTION

a) Acceleration, a = (v – u) / t = (2.8 – 0) / 4.0 = 0.70 m/s^2

b) Force, F = m × a = 1.5 kg × 0.70 m/s² = 1.05 N ≈ 1.1 N

c) A velocity–time graph's gradient shows acceleration; a distance–time graph's gradient shows speed. A velocity–time graph shows changes in velocity (including negative/zero), while a distance–time graph does not.

Question 16

[5 marks]

ANSWER

(a) As the frequency increases, the spacing between wavefronts (wavelength) decreases. · must show frequency and wavelength relationship

(b) 0.48 m/s · must show conversion of wavelength to m, correct substitution, wave speed calculation

Common mistakes: Incorrectly converting mm to m; Using period instead of frequency

MARKING POINTS

B1 (a) · 1 mark · States that as frequency increases, wavelength decreases (or spacing between wavefronts gets smaller).

B2 (a) · 1 mark · Uses the terms frequency and wavelength correctly.

M1 (b) · 1 mark · Converts 12 mm to 0.012 m correctly.

M2 (b) · 1 mark · Writes down v = f × λ or substitutes values into the wave equation.

A1 (b) · 1 mark · Correct final answer for speed to 2 significant figures (0.48 m/s). (follow-through)

WORKED SOLUTION

a) According to the wave equation, for a constant wave speed, as the frequency increases, the wavelength decreases. This means the wavefronts become closer together.

b) Given: $\lambda = 12\ \text{mm} = 0.012\ \text{m}$, $f = 40\ \text{Hz}$

$$v = f\lambda$$

$$v = 40 \times 0.012 = 0.48\ \text{m/s}$$

Question 17

[5 marks]

ANSWER

(a) Potential energy of water (due to tides) is transferred to kinetic energy as the tide moves water through turbines. This kinetic energy turns turbines, which are connected to generators to produce electricity.

(b) Few suitable locations; can harm wildlife habitats; changes tides in estuaries; not continuous—only available at times when tides move (any two).

(c) Gas stations can be turned on quickly at any time, but tidal power depends on natural tidal cycles, so it cannot operate on demand.

MARKING POINTS

T1 (a) · 1 mark · Identifies potential energy of water (tide) to kinetic energy.

T2 (a) · 1 mark · Kinetic energy (water) drives turbine, then generator makes electricity.

D1 (b) · 1 mark · States a valid disadvantage (e.g. limited locations; damage to environment/ habitats).

D2 (b) · 1 mark · States another different disadvantage (e.g. not continuous—dependent on tides).

G1 (c) · 1 mark · Mentions gas can start/stop at any time, tidal can’t respond to sudden demand because cycle is fixed.

WORKED SOLUTION

a) In a tidal power station, gravitational potential energy of water at high tide is converted to kinetic energy as the water moves through turbines. This kinetic energy turns the turbines, which drive generators to produce electricity.

b) Disadvantages: (i) Few places are suitable for building tidal power stations. (ii) They can harm wildlife habitats and only produce power at certain times each day (when tides change).

c) Gas-fired power stations can be started and stopped rapidly to meet sudden increases in demand, whereas tidal power stations can only generate electricity when tides are moving—their operation cannot be controlled to match unexpected changes in demand.

Question 18

[1 mark]

ANSWER

Correct option: Particles in liquids are much closer together than in gases.

Common mistakes: Thinking density is about speed or arrangement

MARKING POINTS

A1 · 1 mark · Correct option selected.

WORKED SOLUTION

The best explanation is that particles in liquids are much closer together than in gases, which makes the density greater.

Question 19

[4 marks]

ANSWER

(a) The red supergiant becomes unstable and explodes as a supernova, throwing most of its mass into space.

(b) A neutron star forms if the leftover core is less than about five times the mass of the Sun; if more, it collapses further to form a black hole from which not even light can escape.

MARKING POINTS

M1 (a) · 1 mark · Mention that the red supergiant becomes unstable.

A1 (a) · 1 mark · Explains that the star explodes as a supernova, casting mass into space.

B1 (b) · 1 mark · Correctly states a neutron star forms if the remnant core is less massive.

B2 (b) · 1 mark · Explains a black hole forms if the core is massive enough to collapse completely.

WORKED SOLUTION

a) After the red supergiant phase, the star becomes unstable and explodes as a supernova, ejecting its outer layers.

b) If the remaining core is less than about five solar masses, it becomes a neutron star; if more, it collapses further into a black hole from which light cannot escape.

Question 20

[4 marks]

ANSWER

(a) 8 m/s · must show correct calculation of speed, correct unit (m/s) and symbol

(b) second (s) · must show unit: second, symbol: s

Common mistakes: using km/h instead of m/s; using minutes/hours for time

MARKING POINTS

M1 (a) · 1 mark · Correct use of speed = distance/time. (follow-through)

A1 (a) · 1 mark · Calculation: 200/25 = 8. (follow-through)

B1 (a) · 1 mark · Correct SI unit/symbol for speed: m/s.

B2 (b) · 1 mark · Correct SI base unit and symbol for time: second (s).

WORKED SOLUTION

a) Average speed = distance ÷ time = 200 m ÷ 25 s = 8 m/s.

b) The SI base unit for time is second (s).

Question 21

[2 marks]

ANSWER

A transformer needs a changing magnetic field, which only occurs with a.c.; d.c. produces a constant field so no voltage is induced in the secondary coil.

Also accept: Transformer only works with a.c. because d.c. does not create a changing magnetic field

Common mistakes: Saying 'd.c. does not work' without explanation

MARKING POINTS

M1 (a) · 1 mark · States transformers need a changing (alternating) magnetic field.

A1 (a) · 1 mark · Explains d.c. produces a constant field, so no voltage is induced.

WORKED SOLUTION

A transformer works by a changing magnetic field, produced by alternating current. D.C. gives a steady magnetic field, so no voltage is induced in the secondary coil.

Question 22

[3 marks]

ANSWER

2.5×10^3 kg/m³ (±50)

Also accept: 2500 kg/m³; 2.5×10^3 kg/m³

Common mistakes: Dividing mass by incorrect volume; Giving answer to wrong significant figures

MARKING POINTS

M1 · 1 mark · Writes out the density formula or attempts to substitute values

A1 · 1 mark · Completes the correct calculation

A2 · 1 mark · States the answer to 2 significant figures with correct unit

WORKED SOLUTION

$$p = \frac{m}{V}$$

Substitute: m = 1.2 kg, V = 0.00048 m³

$$p = \frac{1.2}{0.00048} = 2500$$

The density is 2.5×10^3 kg/m³ (to 2 significant figures).

Question 23

[1 mark]

ANSWER

Correct option: Its volume

Common mistakes: Choosing 'Its pressure'

MARKING POINTS

B1 · 1 mark · Selects correct option: 'Its volume'.

WORKED SOLUTION

When a gas is heated at constant pressure, its temperature increases and so does its volume.

Question 24

[2 marks]

ANSWER

(a) newton / N

(b) second / s

Common mistakes: Confusing 's' and 'sec'

MARKING POINTS

B1 (a) · 1 mark · Correct unit for force: newton (N)

B1 (b) · 1 mark · Correct unit for time: second (s)

WORKED SOLUTION

a) Force: newton (N)

b) Time: second (s)

Question 25

[1 mark]

ANSWER

Correct option: N/kg

Common mistakes: Choosing m/s; Choosing N·m

MARKING POINTS

B1 · 1 mark · Correct unit selected.

WORKED SOLUTION

Gravitational field strength has units newtons per kilogram (N/kg).

Question 26

[3 marks]

ANSWER

66 m (±1)

Must show: Correct substitution: v = 17, u = 5, a = 2, Rearrangement and calculation for s

Common mistakes: Incorrect rearrangement; Using wrong initial/final speed values

MARKING POINTS

M1 · 1 mark · Recognises the appropriate equation and substitutes values correctly.

M2 · 1 mark · Rearranges equation for s. (follow-through)

A1 · 1 mark · Obtains final answer: 66 m (accept answers between 65–67 m). (follow-through)

WORKED SOLUTION

Use the equation:

$$v^2 = u^2 + 2as$$

Rearrange for s:

$$s = \frac{v^2 - u^2}{2a}$$

Substitute: v = 17 m/s, u = 5 m/s, a = 2 m/s²

$$s = \frac{17^2 - 5^2}{2 \times 2} = \frac{289 - 25}{4} = \frac{264}{4} = 66$$

The cyclist covers 66 m.

Question 27

[3 marks]

ANSWER

z = 0.019 (±0.001)

Common mistakes: Incorrect formula rearrangement; Forgetting to use correct lambda

MARKING POINTS

M1 · 1 mark · Writes or quotes red-shift equation: z = (λ_observed - λ_0) / λ_0 or equivalent.

M1 · 1 mark · Substitutes correct values: (600 - 589)/589

A1 · 1 mark · Correct value obtained: z = 0.019 (accept 0.0190 or values rounding within tolerance).

WORKED SOLUTION

$$z = \frac{\lambda_{\text{observed}} - \lambda_0}{\lambda_0}$$

Δλ = 600 nm - 589 nm = 11 nm

$$z = \frac{11}{589} = 0.01867... \approx 0.019$$

Question 28

[1 mark]

ANSWER

Correct option: proton

Common mistakes: Confusing neutron with proton

MARKING POINTS

A1 · 1 mark · Correctly chooses 'proton'.

WORKED SOLUTION

In the fission of uranium-235, protons are not released as products. Neutrons, barium-144 and krypton-89 are produced.

Question 29

[5 marks]

ANSWER

(a) Uranium-235 absorbs a neutron and splits into two smaller nuclei (e.g., barium and krypton), releasing energy and 2 or 3 more neutrons: ${}^{235}_{92}U + {}^{1}_{0}n \rightarrow {}^{144}_{56}Ba + {}^{89}_{36}Kr + 3{}^{1}_{0}n$. The extra neutrons come from the splitting nucleus.

(b) Control rods absorb excess neutrons to prevent the reaction from running out of control. The moderator slows down released neutrons so they are more likely to cause further fission.

(c) Gamma radiation is a highly penetrating electromagnetic wave with no mass or charge, while beta particles are fast-moving electrons with charge and little mass. Gamma can penetrate thick lead; beta is stopped by aluminium.

MARKING POINTS

M1 (a) · 1 mark · Describes absorption of neutron by uranium-235 and splitting (fission), with notation or words.

A1 (a) · 1 mark · Correctly states emission of 2 or 3 neutrons and mention of energy or daughter nuclei.

B1 (b) · 1 mark · Explains function of control rods in absorbing neutrons.

B2 (b) · 1 mark · Explains moderator's role in slowing down neutrons.

B3 (c) · 1 mark · Correct comparison between gamma and beta in terms of nature, mass/charge, and penetration.

WORKED SOLUTION

a) Fission occurs when uranium-235 absorbs a neutron and splits into two smaller nuclei (such as barium and krypton), releasing energy and 2 or 3 further neutrons:

$$^{235}_{92}U + ^{1}_{0}n \rightarrow ^{144}_{56}Ba + ^{89}_{36}Kr + 3^{1}_{0}n$$

b) Control rods in the reactor absorb neutrons to keep their number steady, preventing the reaction from getting too fast. The moderator slows neutrons down so they are more likely to cause other uranium nuclei to split.

c) Gamma radiation is a wave, has no mass or charge, and can pass through thick lead; beta is a negatively charged electron, much less penetrating, and can be blocked by aluminium.

Question 30

[4 marks]

ANSWER

Also accept: thermal energy due to air resistance or in the cord

Common mistakes: Omitting mention of elastic energy; Failing to state where energy is dissipated; Mixing up energy transfers and stores

MARKING POINTS

M1 · 1 mark · States energy initially as gravitational potential energy (GPE).

M2 · 1 mark · Describes transfer from GPE to kinetic energy (KE) as the jumper falls.

M3 · 1 mark · Describes transfer from kinetic to elastic potential energy as the cord stretches.

M4 · 1 mark · Identifies energy not conserved as useful energy, such as dissipation as heat or sound.

WORKED SOLUTION

When the bungee jumper steps off the platform, their energy is almost entirely gravitational potential energy (GPE) due to their height above the ground. As the jumper falls, this GPE is transferred to kinetic energy (KE) as their speed increases. As they near the end of the cord, the elastic cord stretches, converting the kinetic energy into elastic potential energy stored in the stretched cord. As the jumper slows to a stop at the lowest point, most of the kinetic energy has been transferred to elastic potential energy. Some energy is not conserved usefully: energy is dissipated due to air resistance and internal friction in the cord, which is transferred as heat and sound to the surroundings.

Finished this paper?

Check it yourself with the free mark scheme, or create a free SubjectCover account to take it again for marking, explanations and progress tracking.

subjectcover.com/practice/physics/papers/physics-practice-paper-1