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GCSE Physics 6-Mark Question Bank

Edexcel edition · 52 questions covering every topic · Practice booklet with working space

How to use this booklet
Edexcel GCSE Physics (1PH0): Paper 1 covers topics 1 to 7 (Key concepts to Astronomy) and Paper 2 covers topics 1 and 8 to 15 (Energy: forces doing work to Forces and matter). Each paper is 1 hour 45 minutes and 100 marks.

Every question is worth 6 marks. Write your answer on the lines, then mark it using the separate Answers booklet. Tick the level you reached. Redo any question where you reached Level 1 or 2 after two days.

*These are original practice questions written in the style of the Edexcel papers. They are not official questions, and no booklet can list every question an exam board might ask, but together they cover every topic area. Questions marked **Physics only** are for separate-science GCSE Physics; Combined Science students can skip them.*

How 6-mark questions are marked

Extended-response questions (starred * on the Edexcel paper) are marked using levels. The mark scheme gives indicative content that is not prescriptive, so any valid scientific point can earn credit, and the examiner decides the level that best fits the whole answer. Marks also reward a logical structure with the ideas linked together.

Level	Marks	What the examiner looks for
Level 3	5 – 6	A clear, detailed and logically ordered answer that covers the key points and links them with correct scientific reasoning and terms.
Level 2	3 – 4	Some relevant points with some explanation, but with gaps, or the points are not fully linked.
Level 1	1 – 2	Simple, separate statements with little or no explanation or link between ideas.
No marks	0	No relevant science.

How to answer a 6-mark question

• **Underline the command word** (describe, explain, compare, evaluate) and the key topic words.
• **Plan 5 or 6 points** before you write, in a sensible order.
• **Use key terms and equations** correctly, for example 'potential difference' and 'resultant force'.
• **Link your ideas** with because, so and therefore. Facts alone do not reach Level 3.
• **For methods:** name the equipment, what you change, what you measure, what you control and how you calculate the result.

- **For evaluate questions:** give both sides and finish with a justified conclusion.

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2 Motion and forces · Paper 1

1 **Practical** **[6 marks]**

* Describe an investigation to show how the acceleration of a trolley depends on the resultant force acting on it. Explain how you would obtain reliable results.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

2 **Explain** **[6 marks]**

* A skydiver jumps from a plane, falls, opens the parachute and then lands. Describe and explain the changes to the skydiver's speed during the fall.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

3 **Explain** **[6 marks]**

* Explain how a driver's speed, reaction time and the condition of the road and vehicle affect the distance needed to stop a car safely.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

4 **Explain** · **Physics only** **[6 marks]**

* Explain how crumple zones, seat belts and air bags reduce the risk of injury to people in a car crash.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

5 **Explain** **[6 marks]**

* A rocket accelerates upwards from the ground. Use Newton's laws of motion to explain why it accelerates.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

3 Conservation of energy · Paper 1

6 **Explain** **[6 marks]**

* A ball is dropped from a height of 1.5 m onto the floor. It bounces back to a height of only 1.1 m. Explain what happens to the energy of the ball and why it does not return to its original height.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

7 **Evaluate** **[6 marks]**

* Evaluate the use of wind turbines compared with a coal-fired power station for generating electricity in the UK.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

8 **Explain** **[6 marks]**

* A homeowner wants to reduce the energy lost from their house. Explain how loft insulation and cavity wall insulation reduce the rate of energy transfer, and how the homeowner could decide whether the insulation is worth installing.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

9 **Explain** **[6 marks]**

* A bungee jumper steps off a platform and falls until the cord is fully stretched, then bounces back up. Describe and explain the energy transfers that happen during the jump.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

4 Waves · Paper 1

10 **Practical** **[6 marks]**

* Describe a method to measure the speed of water waves in a ripple tank. Include the measurements you would take and how you would use them.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

11 **Describe** · **Physics only** **[6 marks]**

* Describe how sound waves travel through air and explain how the pitch and loudness of the sound are related to the wave.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

12 **Explain** · **Physics only** **[6 marks]**

* Explain how ultrasound is used to produce an image of an unborn baby, and why this is safer than using X-rays.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

13 **Explain** · **Higher** **[6 marks]**

* Explain how earthquake waves provide evidence for the structure of the Earth, including why S-waves are not detected on the opposite side of the Earth.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

5 Light and the electromagnetic spectrum · Paper 1

14 **Practical** **[6 marks]**

* Describe an investigation to show how light is refracted as it passes through a rectangular glass block. Include the measurements you would take and describe the pattern in your results.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

15 **Practical** **[6 marks]**

* Describe an investigation to find out how the type of surface affects the amount of infrared radiation it emits.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

16 **Compare** **[6 marks]**

* Compare the uses and dangers of ultraviolet radiation, X-rays and gamma rays.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

17 **Explain** **[6 marks]**

* Explain how radio waves are produced and how they are received.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

18 **Explain** · **Physics only** **[6 marks]**

* Explain how a convex lens can be used as a magnifying glass, and how this differs from the way it forms an image on a screen.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

19 **Explain** · **Physics only** **[6 marks]**

* Explain how the temperature of the Earth is affected by the radiation it absorbs and emits, and how greenhouse gases change this.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

6 Radioactivity · Paper 1

20 **Describe** **[6 marks]**

* Describe how the model of the atom has changed over time, and explain what caused each change.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

21 **Explain** **[6 marks]**

* Describe the alpha particle scattering experiment and explain how its results led to the nuclear model of the atom.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

22 **Compare** **[6 marks]**

* Compare alpha, beta and gamma radiation in terms of what they are, their penetrating power, their ability to ionise, and which is most hazardous inside and outside the body.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

23 **Explain** **[6 marks]**

* Explain what is meant by the half-life of a radioactive isotope, and explain why half-life is important when choosing an isotope for use in medicine and when storing nuclear waste.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

24 **Explain** **[6 marks]**

* Explain the difference between irradiation and contamination, and describe the precautions that can be taken to reduce the risks to people who work with radioactive sources.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

25 **Explain** **[6 marks]**

* Technetium-99m is used as a medical tracer to find problems in organs. It emits gamma radiation and has a half-life of about 6 hours. Explain why technetium-99m is suitable for this use.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

26 **Compare** **[6 marks]**

* Compare nuclear fission and nuclear fusion, including why it is difficult to build a fusion power station.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

27 **Explain** **[6 marks]**

* Explain how a chain reaction happens in a nuclear reactor and how it is controlled to produce electricity safely.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

28 **Evaluate** · **3 Conservation of energy** **[6 marks]**

* Evaluate the use of nuclear power stations to generate electricity compared with fossil fuel power stations.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

7 Astronomy · Paper 1

29 **Describe** · **Physics only** **[6 marks]**

* Describe the life cycle of a star like the Sun, and explain how the life cycle of a star much more massive than the Sun is different.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

30 **Explain** · **Physics only** **[6 marks]**

* Explain how red-shift and the cosmic microwave background radiation provide evidence for the Big Bang theory.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

31 **Explain** · **Physics only** **[6 marks]**

* Explain why satellites in different orbits around the Earth have different speeds and orbital periods, and give one use of a geostationary satellite.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

32 **Compare** · **Higher** **[6 marks]**

* Compare the Big Bang theory with the Steady State theory of the universe and explain why the Big Bang theory is now generally accepted.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

8 Energy – forces doing work · Paper 2

33 **Practical** **[6 marks]**

* Describe an investigation to find how the extension of a spring depends on the force applied to it. Explain how you would use your results.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

9 Forces and their effects · Paper 2

34 **Explain** · **Physics only** **[6 marks]**

* Explain why a long-handled spanner makes it easier to undo a tight nut.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

10 Electricity and circuits · Paper 2

35 **Explain** **[6 marks]**

* A student connects a cell to a lamp using wires. Describe what happens to the charge and the energy in the circuit when the circuit is complete.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

36 **Practical** **[6 marks]**

* Describe a method to investigate how the resistance of a wire depends on its length. Include the measurements you would take and how you would use them.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

37 **Explain** **[6 marks]**

* Describe how you would obtain the current–potential difference (I–V) graph for a filament lamp, and explain the shape of the graph you would expect.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

38 **Explain** **[6 marks]**

* The lamps in a house are connected in parallel rather than in series. Explain the advantages of this.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

39 **Explain** **[6 marks]**

* Explain how the live wire, neutral wire, earth wire and fuse in a three-pin plug make an electrical appliance safe to use.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

40 **Explain** **[6 marks]**

* A light-dependent resistor (LDR) is used in a circuit to switch a lamp on automatically when it gets dark. Explain how the LDR makes this possible.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

11 Static electricity · Paper 2

41 **Explain** · **Physics only** **[6 marks]**

* A student rubs a polythene rod with a cloth and then holds the rod near small pieces of paper, which jump up towards the rod. Explain, in terms of charge, why this happens.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

12 Magnetism and the motor effect · Paper 2

42 **Describe** **[6 marks]**

* Describe how you would plot the magnetic field around a bar magnet using a plotting compass, and describe the pattern you would find.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

43 **Explain** **[6 marks]**

* Explain how the strength of an electromagnet can be increased, and describe how an electromagnet can be used to move scrap metal.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

44 **Explain** **[6 marks]**

* Explain how a simple direct-current electric motor works and how its speed can be increased.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

13 Electromagnetic induction · Paper 2

45 **Explain** **[6 marks]**

* Explain how the National Grid transfers electrical energy efficiently from power stations to homes.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

46 **Explain** · **Physics only** **[6 marks]**

* Explain how a simple generator (alternator) produces an alternating potential difference, and how the output can be increased.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

47 **Explain** · **Physics only** **[6 marks]**

* Explain how a transformer works and why it only works with alternating current.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

14 Particle model · Paper 2

48 **Practical** **[6 marks]**

* Describe a method you could use to find the specific heat capacity of a metal block. Include the measurements you would take and how you would use them to calculate the result.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

49 **Practical** **[6 marks]**

* Describe how you would determine the density of an irregularly shaped solid and of a liquid. Include the measurements you would take and how you would use them.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

50 **Explain** **[6 marks]**

* Ice is heated steadily until it has melted and the water has boiled. The temperature stays constant while the ice melts and while the water boils. Explain why, using the particle model.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

51 **Explain** · **Physics only** **[6 marks]**

* Explain, using the particle model, why the pressure of a fixed mass of gas in a sealed container increases (a) when the gas is heated and (b) when the volume of the container is decreased at a constant temperature.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6

15 Forces and matter · Paper 2

52 **Explain** · **Physics only** **[6 marks]**

* Explain why the base of a dam wall is built much thicker than the top, and why atmospheric pressure decreases as you climb a mountain.

Level achieved: ☐ 1 ☐ 2 ☐ 3 Mark: _____ / 6