AQA GCSE Physics | 8463

SPECIFICATION POINT 4.5.5.2

Atmospheric pressure

Mark schemes and examiner comments

Tier	**Foundation**
Question groups	**3**
Available paper years	**2008–2023**

Using this booklet

1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

Name: _____ **Date:** _____

Where a precise marking extract is unavailable, the full source document is included in an appendix. Any missing mark scheme is explicitly identified.

4.5.5.2 Atmospheric pressure

Answer 01 · Mark scheme June 2008 | PHY3F | Original Q7 | Legacy

Question 7

question	answers	extra information	Mark
(a)(i)	the higher the altitude the longer the period	**or** the converse **or** there is a positive correlation do **not** credit any reference to 'direct proportion' ignore references to speed / size of orbit allow the higher the altitude the longer it takes to orbit do **not** credit if ambiguity between distance and time	1
(a)(ii)	responses must refer to the (quality) of the data rather than comments on satellites any **two** from: • only four pairs (of results / data / evidence) • the data is (all) for low or high altitudes (with nothing in the middle) • conclusion only valid in the range (shown, of 300 ↔ 36 000 or 1.5 ↔ 24) • the Internet is not always a reliable source	**or** 'not enough / insufficient data	2
(b)	there is a centripetal force the force (for this) is provided by gravity / gravitational attraction (between the Moon and the Earth)	accept force towards centre / Earth **or** 'the Moon is accelerating towards the (centre of) Earth' accept 'caused by gravity'	1 1

Question 7 continues on the next page

4.5.5.2 Atmospheric pressure

PHY3F

Question 7 continued

question	answers	extra information	Mark
(c)	there is <u>empty</u> space / a vacuum (between the spaceships)	**or** no medium / particles / air / gas (to carry the sound / vibrations) **or** sound(s) do not travel through a vacuum do **not** accept any named gas	1
(d)	the response may be in agreement or disagreement or may support a 'balanced' argument **either** any general point with appropriate amplification for **2** marks **or** two general points **1** mark each	 eg costs a lot (1) the money could be spent on …(1) eg we may find new resources (1) eg we may contact aliens (1)	2
total			8

4.5.5.2 Atmospheric pressure

Answer 02 · Mark scheme

June 2022 | 8463/2F | Original Q6

Question 6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	100 km		1	AO3 4.5.5.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.2	gas		1	AO1 4.5.5.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.3	90 000 (Pa)	allow 89 500 to 90 500	1	AO2 4.5.5.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.4	101 000 – 90 000 = 11 000 (Pa)	allow ecf from question **06.3**	1	AO2 4.5.5.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.5	the density of the air decreases the mass of air above the student decreases		1 1	AO2 4.5.5.2

4.5.5.2 Atmospheric pressure

Answer 02 · Mark scheme

June 2022 | 8463/2F | Original Q6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.6	$P = \frac{188\,000\,000}{2000}$ 94 000 (Pa)		1 1	AO2 4.5.5.1.1

Total Question 6		**8**

4.5.5.2 Atmospheric pressure

Answer 03 · Mark scheme

June 2023 | 8463/2F | Original Q10

Question 10

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.1	7.1 (cm) 497 (m)	allow 7.0 to 7.3 (cm) allow 70 × their measurement of displacement	1 1	AO2 4.5.6.1.1

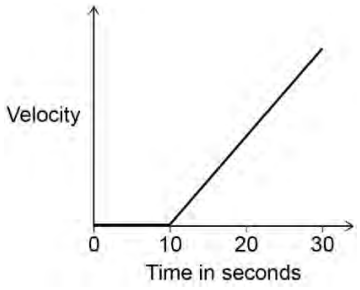
Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.2	0 (N)		1	AO2 4.5.1.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.3	constant velocity	allow constant speed (in a straight line) do **not** accept stationary allow constant acceleration if a **mathematical error** in 02.2 gives a non-zero value for resultant force	1	AO1 4.5.6.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.4	any **one** from: • tension • normal contact (force) • upthrust	allow lift, thrust and water resistance allow normal reaction (force) ignore drag	1	AO1 4.5.1.2

4.5.5.2 Atmospheric pressure

Answer 03 · Mark scheme June 2023 | 8463/2F | Original Q10

Question	Answers		Mark	AO / Spec. Ref.
10.5	horizontal line drawn to 10s along the *x*-axis		1	AO3 4.5.6.1.4
	line with a positive gradient starting from 10 s	allow an upward curving line with increasing gradient starting from 10 s  	1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.6	line of best fit drawn and extrapolated to 10 km	do **not** accept a straight line	1	AO2 4.5.5.2
	28 (kPa)	allow 26 to 32 (kPa) allow a value correctly extrapolated from their line allow 2 marks for a correct mathematically extrapolated value	1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.7	the average density of the air above the aeroplane decreases		1	AO3 4.5.5.2

Total Question 10	**10**

4.5.5.2 Atmospheric pressure

Answer 02 · Examiner comments June 2022 | 8463/2F | Original Q6

Question 6 (Low demand)

06.1 Very few of the students could give a correct approximate depth of the Earth's atmosphere.

06.2 Most of the students chose the correct answer although 'Liquid' was a common incorrect choice.

06.3 Approximately three quarters of the students were able to read the correct value from the graph.

06.4 Few of the students seemed to understand what is meant by 'sea level'. As a consequence, they were not able to read a correct value from the graph. Only about 25% of students scored the mark.

06.5 Most of the students scored at least 1 mark, with about a quarter scoring both marks.

06.6 The calculation was well done with just over three quarters of the students scoring both marks. Where an error was made, it was usually with the 2000 m^2 with some students squaring the 2000 rather than realising it is part of the unit.

Answer 03 · Examiner comments June 2023 | 8463/2F | Original Q10

10.1

Only 9% of students calculated the displacement correctly. Those who did not gain the mark simply measured the route taken by the aircraft and scaled that distance up. A small minority didn't attempt the question.

10.2

27% of students gained the mark for the resultant force. Some missed out a force, others did not know how to combine the forces.

10.3

6% of students, who calculated the resultant force correctly, also scored this mark. Very few correctly described the motion using simplistic descriptions like moving forwards or moving slowly, rather than describing the motion in terms of velocity speed and acceleration. It was common to see the aircraft was "stationary", even though the question says it is moving.

10.4

Some students confused energy and force. It was common to see non-contact forces given. 20% of students could name an additional contact force.

4.5.5.2 Atmospheric pressure

10.5

6% of students scored 1 mark, usually for drawing an upward line/curve from 10s. Only 23 % of students scored 2 marks.

10.6

A minority of students attempted to draw a smooth curve and extrapolate this to the 10km line. Those who did generally obtained full marks by using the graph correctly, with 12% of students scoring both marks. A number of students miscalculated the scale on the graph and quoted incorrect values from their line. It was more common to see a straight line, which often allowed the award of 1 mark for a correct reading of the value.

10.7

50% of students knew that as the height of the aeroplane above the ground increased, the average density of the air decreased.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.