REDSPOT

O LEVEL

CLASSIFIED EXAM PAPERS

PHYSICS

Paper 1 (MCQ) - All Variants

(Syllabus 5054)

period	**2013 to 2024**
contents	**June & November, Paper 1 (P11 & P12) With Answers**
form	**Topic By Topic**
compiled for	**O Levels**

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Topic 1 Physical Quantities & Measurement Techniques

TOPIC 1.1
Units, Symbols and Measurement Techniques

Q1. A workman measures, as **accurately** as possible, the length and internal diameter of a straight copper pipe.

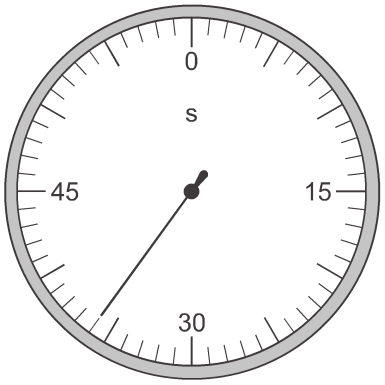
The length is approximately 600 cm and the internal diameter is approximately 2 cm.

What is the best combination of instruments for the workman to use?

	internal diameter	length
A	ruler	ruler
B	ruler	tape
C	vernier calipers	ruler
D	vernier calipers	tape

[June 2014/P11/Q1]

Q2. The diagram shows a stopwatch.



What is the reading on the stopwatch?

A 30.6 s **B** 33.0 s

C 36.0 s **D** 36.6 s

[June 2014/P11/Q2]

Q3. A student measures, as **accurately** as possible, the length and internal diameter of a straight glass tube.

The length is approximately 25 cm and the internal diameter is approximately 2 cm.

What is the best combination of instruments for the student to use?

	internal diameter	length
A	ruler	micrometer
B	ruler	ruler
C	vernier calipers	micrometer
D	vernier calipers	ruler

[June 2014/P12/Q3]

Q4. Which device can be used to measure the thickness of a single sheet of paper?

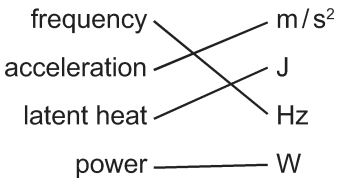
A a metre rule **B** a micrometer

C a plastic ruler **D** a measuring tape

[Nov 2014/P11/Q2]

Q5. In a test, four students linked the quantities on the left with their units on the right.
Which student matched them all correctly?

A



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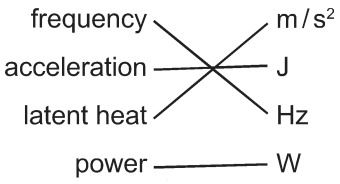

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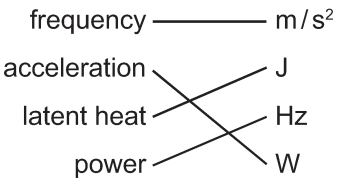
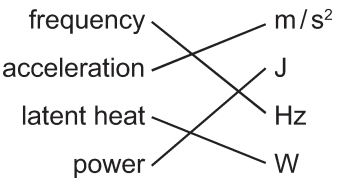


D



[Nov 2014/P11/Q3]

Q6. The diameter and the length of a thin wire, approximately 50 cm in length, are measured as precisely as possible.
What are the best instruments to use?

	diameter	length
A	micrometer	rule
B	micrometer	vernier calipers
C	rule	tape
D	vernier calipers	rule

[June 2015/P11/P12/Q2]

Q7. Newton's third law involves two quantities which are equal in size and opposite in direction.
What is the unit for these two quantities?

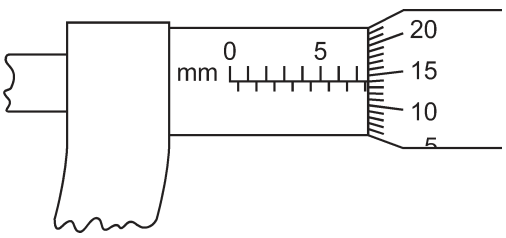
A J **B** m/s^2 **C** N **D** W

[June 2015/P11/Q9]

Q8. The diagram shows a micrometer scale.
Which reading is shown?

A 5.64 mm **B** 7.14 mm

C 7.16 mm **D** 7.64 mm



[Nov 2015/P11/P12/Q3]

Q9. How can *one volt* also be expressed?

A one coulomb per ampere
B one coulomb per joule
C one joule per ampere
D one joule per coulomb

[June 2016/P11/Q30]

Q10. A student determines the circumference of a golf ball.

Which instrument gives a reading that is the circumference of the golf ball?

A calipers **B** micrometer **C** rule **D** tape

[June 2016/P12/Q1]
Repeat [June 2016/P11/Q3]

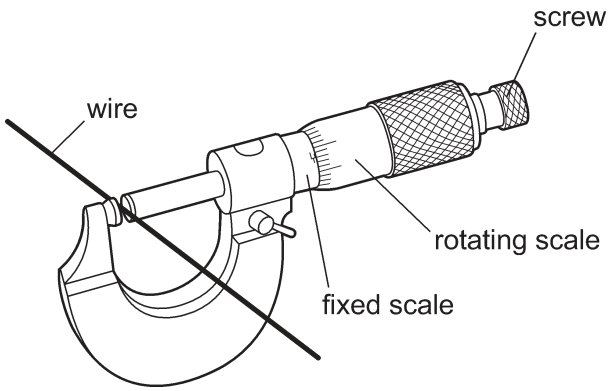
Q11. A length of copper wire is labelled 'length 30 m' and 'diameter 0.50 mm'.

Which instruments are most suitable to measure accurately the length and the diameter of the wire?

	length	diameter
A	rule	calipers
B	rule	micrometer
C	tape	calipers
D	tape	micrometer

[Nov 2016/P11/P12/Q1]

Q12. A micrometer is used to measure the diameter of a uniform wire.

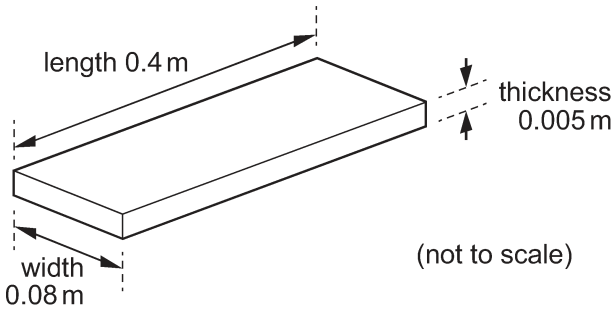


What is done to obtain an accurate answer?

A Make the micrometer horizontal and then use the scales to find the reading.
B Subtract the fixed-scale reading from the rotating-scale reading.
C Subtract the rotating-scale reading from the fixed-scale reading.
D Use the scales to find the reading and add or subtract any zero error.

[June 2017/P12/Q3]
Repeat [June 2017/P11/Q1]
[June 2013/P11/Q2]

Q13. A manufacturer measures the three dimensions of a wooden floor tile using three different instruments. The approximate dimensions of the tile are shown.



Which instruments are used to measure accurately each of these dimensions?

	length	thickness	width
A	metre rule	micrometer	calipers
B	metre rule	calipers	micrometer
C	micrometer	metre rule	calipers
D	calipers	micrometer	metre rule

[Nov 2017/P12/Q2]
Repeat [Nov/2017/P11/Q2]
[June/2012/P11/Q1]

Q14. A student wishes to measure directly the circumference of a football.
Which is the most suitable instrument to use?

A calipers **B** a measuring tape **C** a micrometer **D** a ruler

[June 2018/P11/Q2]

Q15. What is the name and value of the unit of power written as mW?

	name	value
A	megawatt	10^{-3} W
B	megawatt	10^{6} W
C	milliwatt	10^{-3} W
D	milliwatt	10^{6} W

[June 2018/P12/Q3]

Q16. Micrometers, metre rules, tapes and calipers are used for measuring lengths.
Which row identifies the most suitable device for accurately measuring the stated length?

	length	measuring device
A	0.15 mm	micrometer
B	0.50 mm	metre rule
C	0.15 m	tape
D	0.50 m	calipers

[June 2018/P12/Q4]

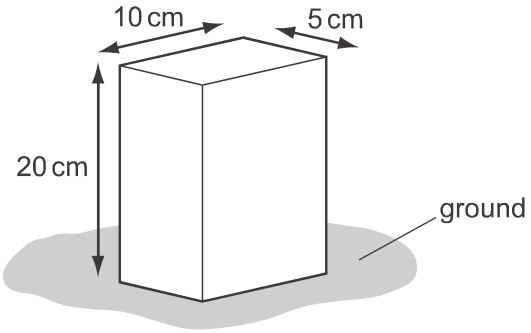
TOPIC 1.1

Answer Keys

1. D	2. C	3. D	4. B	5. A	6. A
7. C	8. D	9. D	10. D	11. D	12. D
13. A	14. B	15. C	16. A	17. A	18. B
19. C	20. D	21. B	22. B	23. D	24. C
25. B	26. A	27. D	28. B	29. D	30. D
31. B	32. B	33. D			

TOPIC 8
Pressure

Q1. A brick of weight 80 N stands upright on the ground as shown.



What is the pressure it exerts on the ground?

A 0.080 N/cm^2 **B** 0.40 N/cm^2 **C** 0.80 N/cm^2 **D** 1.6 N/cm^2

[June 2013/P11/Q8]

Q2. When a gas in a container of fixed volume is heated, the pressure of the gas increases.

Which statement explains this?

A The molecules expand and get heavier, so they hit each other harder.

B The molecules have less room to move, so they collide with each other more frequently.

C The molecules hit the walls harder and less frequently.

D The molecules move faster, so they collide with the walls more frequently.

[June 2013/P11/Q16]

Q3. An airtight container holds a fixed mass of gas. Its pressure and volume are measured on four occasions when the temperature is 20°C.

The results are shown in the table. Three sets of readings are correct.

Which set of readings is **not** correct?

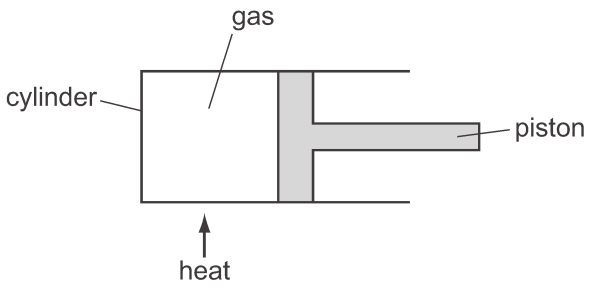
	pressure/kPa	volume/cm^3
A	120	36
B	100	48
C	80	60
D	60	80

[June 2013/P12/Q12]
Repeat [June 2013/P11/Q9]

Q4. The diagram shows a fixed mass of gas in a cylinder fitted with a piston that can move easily.

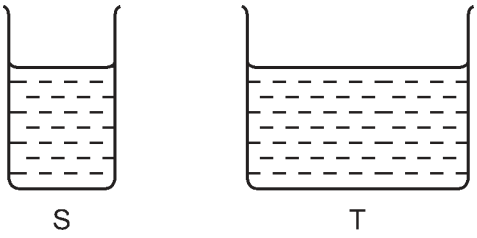
What is the change, if any, in the pressure and volume of the gas after it is heated?

	pressure	volume
A	no change	increases
B	decreases	no change
C	decreases	increases
D	increases	decreases



[June 2013/P12/Q20]

Q5. Two vessels S and T are filled to the same level with the same liquid. The area of the base of S is less than that of T.



Which statement is correct?

A The force on the base of S is greater than the force on the base of T.

B The force on the base of S is the same as the force on the base of T.

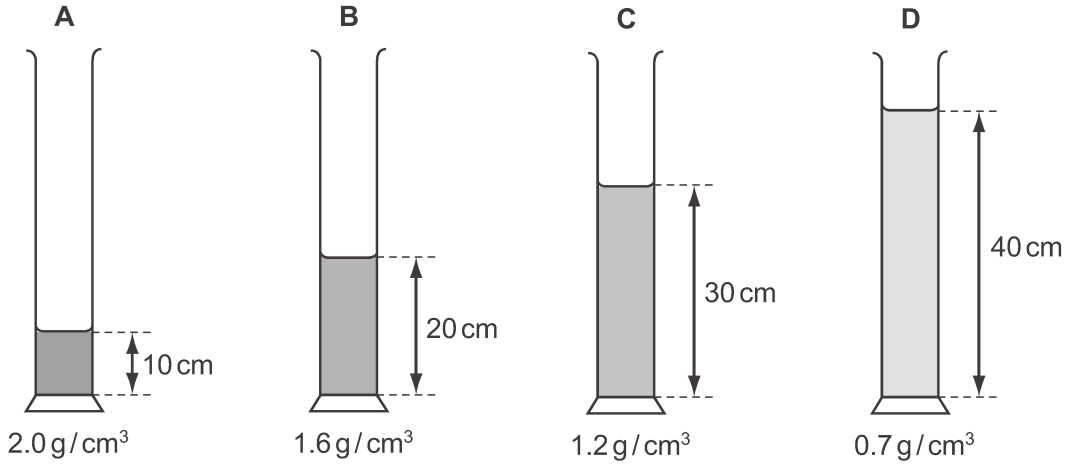
C The pressure on the base of S is greater than the pressure on the base of T.

D The pressure on the base of S is the same as the pressure on the base of T.

[Nov 2013/P12/Q10]

Q6. Four different liquids are poured into identical measuring cylinders. The diagrams show the depths of the liquids and their densities.

Which liquid causes the largest pressure on the base of its measuring cylinder?



[Nov 2013/P12/Q11]
Repeat [Nov 2013/P11/Q9]

Q7. The conditions at the bottom and at the surface of a lake are given in the table.

	bottom of lake	surface of lake
temperature	10 °C	10 °C
pressure	500 kPa	100 kPa

A bubble of volume 1.0 cm^3 forms at the bottom of the lake.

What is the volume of the bubble as it reaches the surface?

A 0.20 cm^3 **B** 0.25 cm^3 **C** 4.0 cm^3 **D** 5.0 cm^3

[Nov 2013/P12/Q12]

Q8. Air is heated in a sealed container with constant volume.

Why does the air pressure increase when the temperature increases?

A The air molecules expand.

B The air molecules bounce off each other more frequently.

C The air molecules bounce off the walls more frequently.

D The number of air molecules increases.

[Nov 2013/P12/Q20]

Q9. A piston is supported by gas trapped in a cylinder.

A weight is put on the piston. The volume of gas supporting the piston decreases but the temperature of the gas is unchanged.

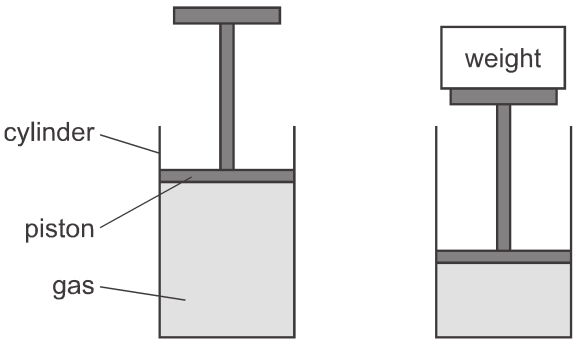
What happens to the molecules?

A They hit the piston more frequently.

B They move more slowly.

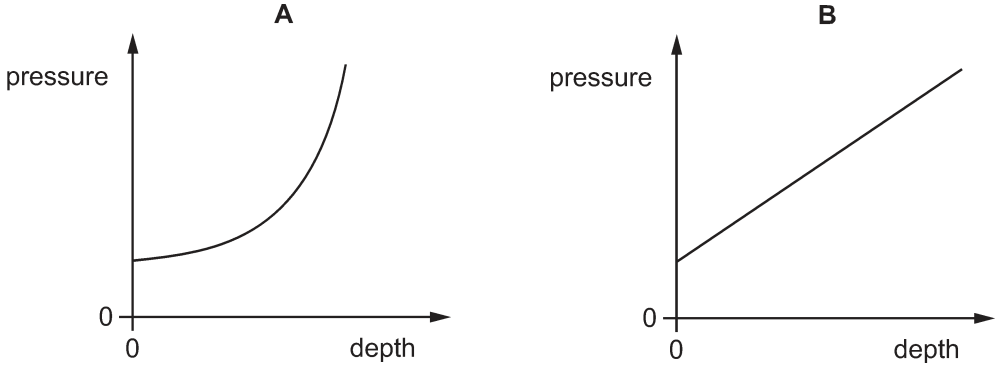
C They have a smaller size.

D They have more kinetic energy.

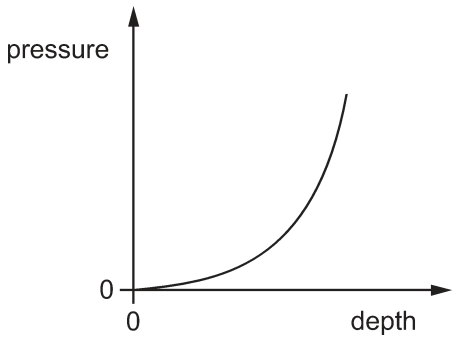


[June 2014/P11/Q18]

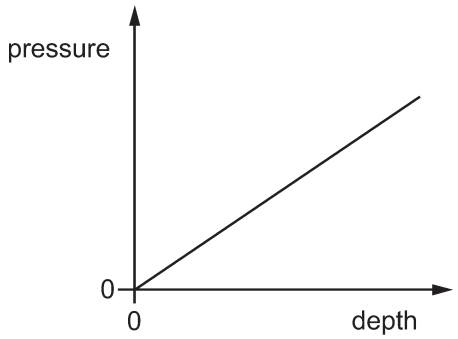
Q10. Which graph shows the total external pressure acting on a submarine at different depths below the surface of the sea?



C



D



[June 2014/P12/Q14]

Q11. A gas occupies a volume of 2.0 m^3 in a cylinder at a pressure of 240 kPa. A piston compresses the gas until the volume is 0.50 m^3, the temperature remaining constant.

What is the new pressure of the gas?

A 60 kPa **B** 240 kPa **C** 480 kPa **D** 960 kPa

[June 2014/P12/Q15]
Repeat [June 2014/P11/Q14]

Q12. Objects of different weights are placed on a rigid, horizontal surface.

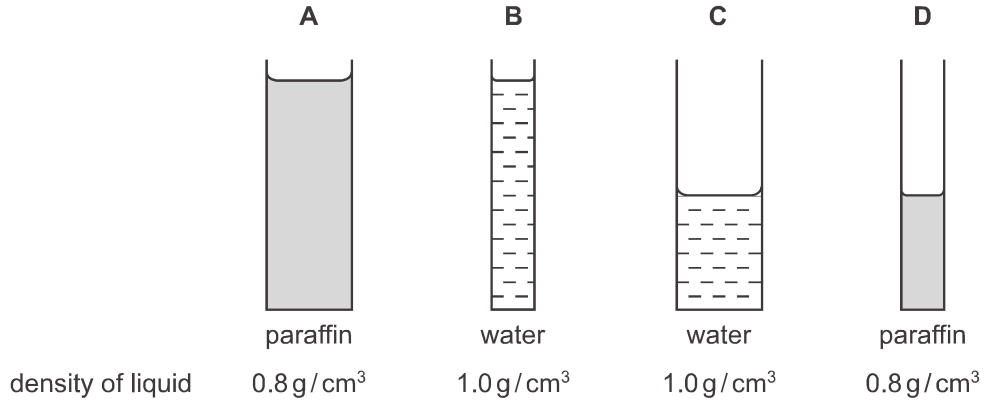
Which row shows the correct pressure acting on the surface?

	weight/N	area in contact/m^2	pressure/Pa
A	10	0.1	1
B	20	0.2	0.01
C	30	0.1	300
D	40	0.2	8

[Nov 2014/P12/Q7]
Repeat [Nov 2014/P11/Q10]

Q13. The diagrams show liquids in containers.

Which column of liquid exerts the greatest pressure on the base of its container?



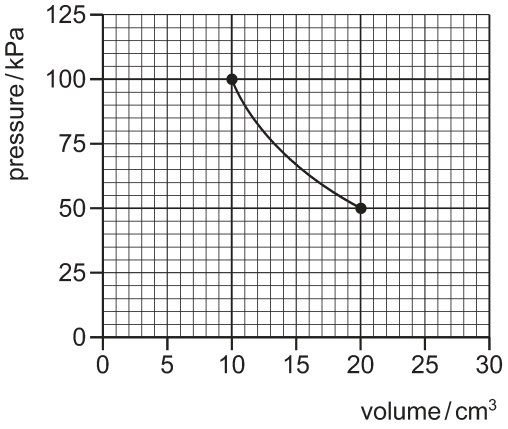
[June 2015/P12/Q10]
Repeat [June 2015/P11/Q14]

Q14. The graph shows how the pressure of a fixed mass of gas varies with volume at constant temperature.

What is the volume of the gas when the pressure is 25 kPa?

A 2.5 cm^3 **B** 10 cm^3

C 30 cm^3 **D** 40 cm^3



[June 2015/P12/Q11]

Q15. Some gas is trapped in a closed container. The gas is cooled and the volume of the container is kept constant.

What happens to the gas molecules?

A They collide with the walls more often.

B They contract.

C They get closer together.

D They move more slowly.

[June 2015/P12/Q20]

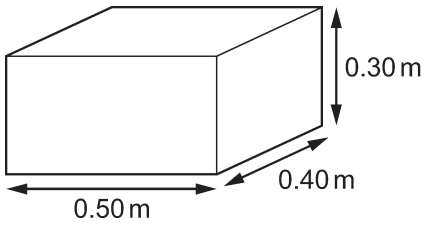
Q16. A block of weight 900 N has rectangular faces. The diagram shows the lengths of the sides.

The block can rest on any of its faces.

What is the minimum pressure that the block can exert on the ground when resting on one of its faces?

A 900 Pa **B** 4500 Pa

C 6000 Pa **D** 7500 Pa



[Nov 2015/P11/Q11]

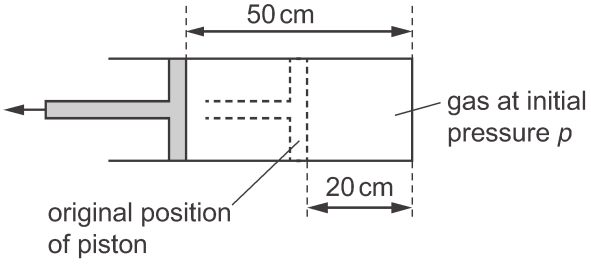
Q17. A gas is trapped inside a cylinder by a movable piston. The length of the gas column is 20 cm and the pressure inside the cylinder is *p*.

The piston is pulled out a distance of 30 cm, so that the length of the gas column is now 50 cm. The temperature of the gas does not change.

What is the new pressure of the gas?

A 0.40 *p* **B** 0.60 *p*

C 1.5 *p* **D** 2.5 *p*

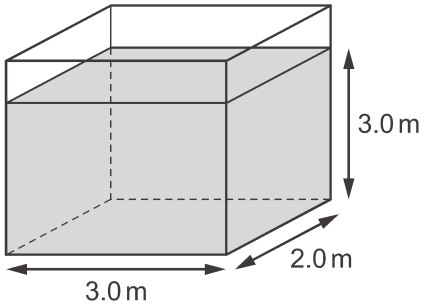


[Nov 2015/P12/Q12]
Repeat [Nov 2015/P11/Q13]

Q18. The base of a rectangular storage tank is 2.0 m by 3.0 m. The tank is filled with paraffin to a depth of 3.0 m.

The density of paraffin is 800 kg/m^3 and the gravitational field strength is 10 N/kg.

What is the pressure at the bottom of the tank due to the paraffin?



A 2400 Pa **B** 14 400 Pa

C 24 000 Pa **D** 144 000 Pa

[Nov 2015/P12/Q13]

Q19. A gas is in a sealed container of constant volume. The gas is heated and the pressure of the gas on the walls of the container increases.

How do the particles of the gas cause this increase in pressure?

A They expand.

B They hit each other more frequently.

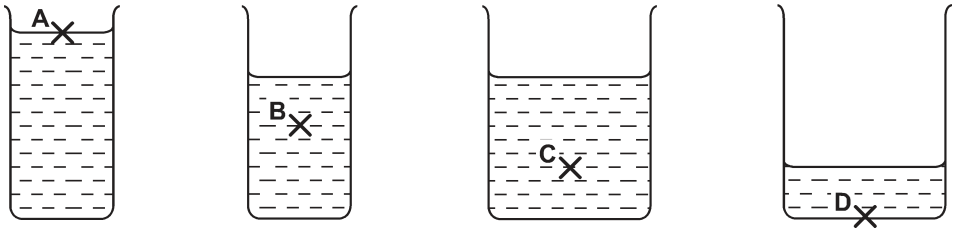
C They hit the container more frequently.

D They vibrate faster.

[Nov 2015/P12/Q16]

Q20. Four beakers contain the same liquid.

At which point is the pressure the greatest?



[June 2016/P12/Q10]
Repeat [June 2016/P11/Q15]
[June 2013/P12/Q11]

Q21. A block of weight W rests on a side of area A. The gravitational field strength is g.

What is the pressure exerted on the ground due to the block?

A WA **B** $\frac{W}{A}$ **C** $\frac{WA}{g}$ **D** $\frac{W}{g}$

[June 2016/P12/Q11]

Q22. Water of depth 10 m exerts a pressure equal to atmospheric pressure.

An air bubble rises to the surface of a lake which is 20 m deep. When the bubble reaches the surface, its volume is 6.0 cm^3.

What is the volume of the air bubble at the bottom of the lake?

A 2.0 cm^3 **B** 3.0 cm^3 **C** 12 cm^3 **D** 18 cm^3

[June 2016/P12/Q12]
Repeat [June 2016/P11/Q16]

Q23. A gas in a container of fixed volume is heated.
What happens to the molecules of the gas?

A They collide less frequently.
B They expand.
C They move faster.
D They move further apart.

[June 2016/P12/Q13]
Repeat [Nov 2012/P12/Q15]

Q24. The pressure of the atmosphere is 100 000 Pa.
What force does the atmosphere exert on the upper surface of a pond of surface area 20 m^2 ?

A 5000 N **B** 100 000 N **C** 100 020 N **D** 2 000 000 N

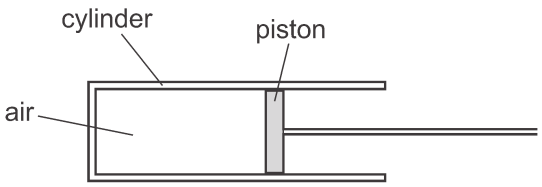
[Nov 2016/P11/Q12]

Q25. Oil of density 8.5×10^2 kg/m^3 is stored in a large tank.
The gravitational field strength *g* is 10 N/kg.
What is the pressure due to the oil 6.0 m below its surface?

A 51 Pa **B** 510 Pa **C** 5100 Pa **D** 51 000 Pa

[Nov 2016/P11/Q13]

Q26. Air is trapped in a cylinder by a piston.
The piston is pushed further into the cylinder.
How do the pressure and the volume of the air in the syringe change?



	pressure	volume
A	decrease	decrease
B	decrease	increase
C	increase	decrease
D	increase	increase

[Nov 2016/P11/Q14]

Q27. Which statement explains how a pressure is exerted by a gas on a container?

A Gas molecules collide with other gas molecules in the container.
B Gas molecules collide with the walls of the container.
C Gas molecules exert strong attractive forces on each other.
D Gas molecules exert strong repulsive forces on each other.

[Nov 2016/P11/Q15]

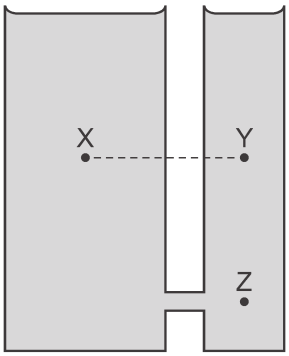
Q28. A gas expands slowly and its temperature remains constant.
What happens to the gas molecules?

A They move further apart and their average speed decreases.
B They move further apart and their average speed increases.
C They move further apart and their average speed remains unchanged.
D They stay the same distance apart and their average speed decreases.

[Nov 2016/P12/Q18]

Q29. Two cylindrical vessels are joined together and filled with water as shown.

How does the pressure at point X compare to the pressure at points Y and Z?

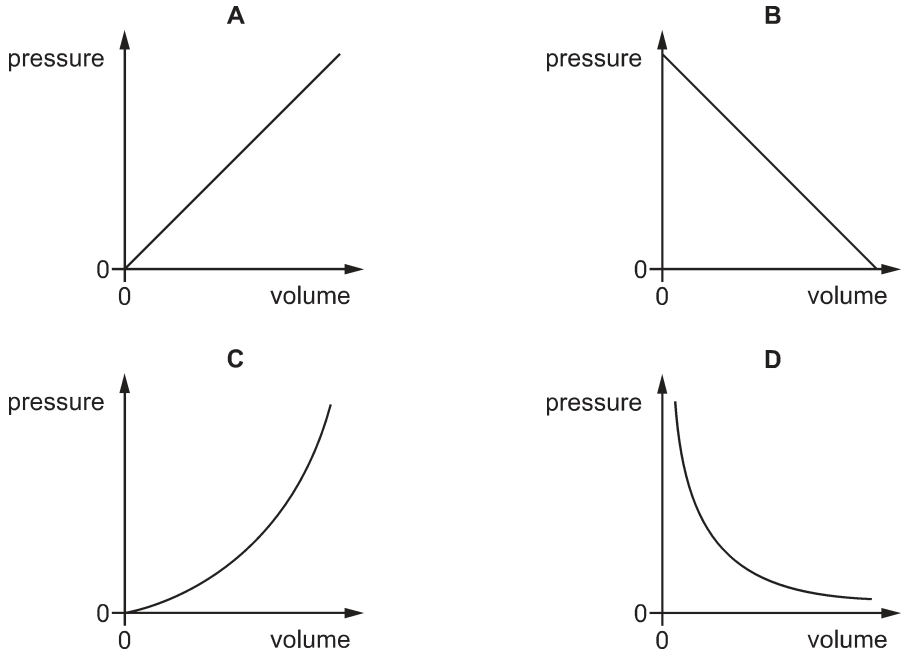


	compared to Y	compared to Z
A	pressure at X is higher	pressure at X is lower
B	pressure at X is higher	pressure at X is the same
C	pressure at X is the same	pressure at X is lower
D	pressure at X is the same	pressure at X is the same

[June 2017/P11/Q16]

Q30. A fixed mass of gas undergoes a change of volume at constant temperature.

Which diagram shows the relationship between the volume and the pressure of the gas?



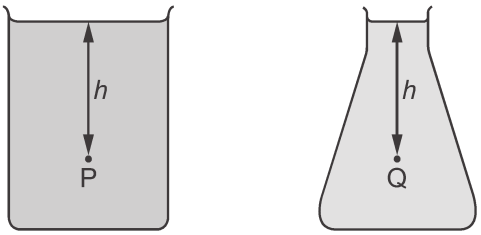
[June 2017/P11/Q19]

Q31. Two glass containers filled with different liquids are placed next to each other.

Point P is a distance *h* below the surface of the liquid in one container.

Point Q is a distance *h* below the surface of the liquid in the other container.

Why is the pressure at P different from the pressure at Q?



A The atmospheric pressure is different at P.

B The densities of the liquids are different.

C The gravitational field strength is different at P.

D The shapes of the containers are different.

[June 2017/P12/Q18]

TOPIC 8

Answer Keys

1. D	2. D	3. A	4. A	5. D	6. C
7. D	8. C	9. A	10. B	11. D	12. C
13. B	14. D	15. D	16. B	17. A	18. C
19. C	20. C	21. B	22. A	23. C	24. D
25. D	26. C	27. B	28. C	29. C	30. D
31. B	32. C	33. B	34. D	35. C	36. C
37. D	38. D	39. B	40. C	41. D	42. C
43. A	44. A	45. A	46. C	47. D	48. D
49. A	50. A	51. C	52. C	53. A	54. B
55. C	56. B	57. D	58. B	59. C	60. B
61. D	62. B	63. A	64. D	65. A	66. C
67. C					