Chapter 3

Properties of waves, including light and sound

3.1 General wave properties

01. 0625_m22_qp_22 Q: 21

A tank contains water. Ripples are produced on the surface of the water. Refraction is observed.

What causes the ripples to refract?

A The cold water in the tank is replaced by warm water.

B The ripples change speed as they move from deep to shallow water.

C The ripples hit the wall of the tank.

D The ripples pass through a narrow gap.

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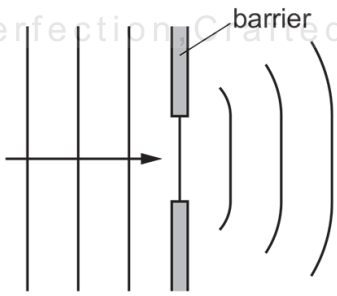
02. 0625_m22_qp_22 Q: 22

The diagram shows wavefronts of a water wave passing through a gap in a barrier.



Which change will increase the diffraction of the wave as it passes through the gap?

A Increase the amplitude of the wave.

B Increase the width of the gap.

C Reduce the depth of water.

D Reduce the frequency of the wave.

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03. 0625_s21_qp_21 Q: 21

A water wave passes into a region where the wave travels more slowly.

As it passes into the slow region, what happens to the frequency and what happens to the wavelength of the wave?

	frequency	wavelength
A	decreases	remains the same
B	increases	remains the same
C	remains the same	decreases
D	remains the same	increases

---

04. 0625_w21_qp_21 Q: 17

The diagram shows waves in a ripple tank containing water.

The waves approach a barrier and pass through the gap in the barrier.

The size of the gap is about the same size as the wavelength of the ripples.

The gap size is increased.

What happens to the ripple pattern to the right of the barrier?

A The ripples are closer together.

B The ripples are further apart.

C The ripples are more curved.

D The ripples are less curved.

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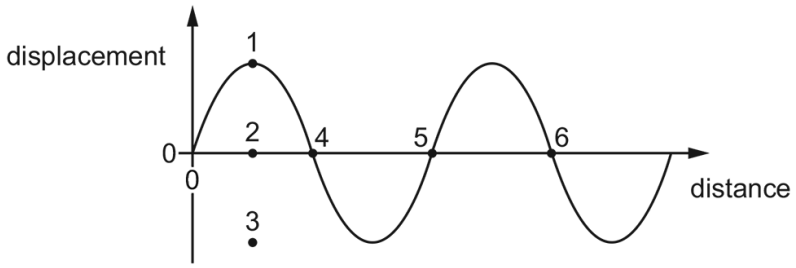
05. 0625_w21_qp_21 Q: 18

The diagram shows a wave.



Which row correctly indicates the amplitude and the wavelength of the wave?

	amplitude	wavelength
A	the distance between 1 and 2	the distance between 4 and 5
B	the distance between 1 and 2	the distance between 4 and 6
C	the distance between 1 and 3	the distance between 4 and 5
D	the distance between 1 and 3	the distance between 4 and 6

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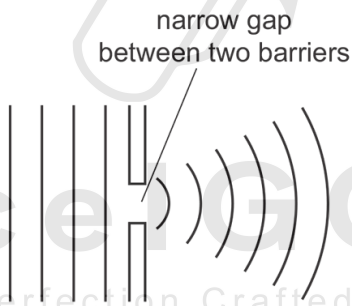
06. 0625_w21_qp_22 Q: 17

The diagram shows the pattern of water waves as they pass through a narrow gap.



Which row names the process shown and describes the effect of using a wider gap?

	name of process	wider gap
A	refraction	waves spread out less
B	refraction	waves spread out more
C	diffraction	waves spread out less
D	diffraction	waves spread out more

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07. 0625_w21_qp_22 Q: 18

Which row is **not** correct for a wave on the surface of water?

	quantity	usual unit
A	amplitude	m
B	frequency	Hz
C	wavelength	λ
D	speed	m/s

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08. 0625_w21_qp_23 Q: 18

Which row correctly defines the frequency and the speed of a wave?

	frequency	speed
A	number of waves	distance travelled per unit time
B	number of waves	time taken for one complete wave to pass a point
C	number of waves passing per unit time	distance travelled per unit time
D	number of waves passing per unit time	time taken for one complete wave to pass a point

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09. 0625_m20_qp_22 Q: 23

Four students **A**, **B**, **C** and **D**, investigate the diffraction of water waves through a gap.

Each student uses a different gap size and a different wavelength for the water waves.

Which student produces the waves which have the most diffraction?

	gap size / cm	wavelength / cm
A	2.0	1.8
B	3.0	2.1
C	4.0	2.0
D	5.0	0.9

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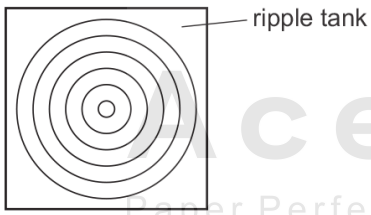
10. 0625_m20_qp_22 Q: 24

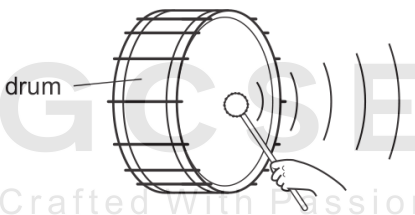
The diagrams show examples of wave motion.

1



waves on water

2



waves in air

3

waves on a rope

4

waves in a spring

Which waves are longitudinal?

A 1 only **B** 2 and 3 only **C** 2, 3 and 4 **D** 2 and 4 only

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11. 0625_m20_qp_22 Q: 27

The wavelength of blue light changes from 4.7×10^{-7} m to 3.5×10^{-7} m as it passes from air to water.

What is the speed of this light in water?

A 7.4×10^{7} m/s

B 1.3×10^{8} m/s

C 2.2×10^{8} m/s

D 3.0×10^{8} m/s

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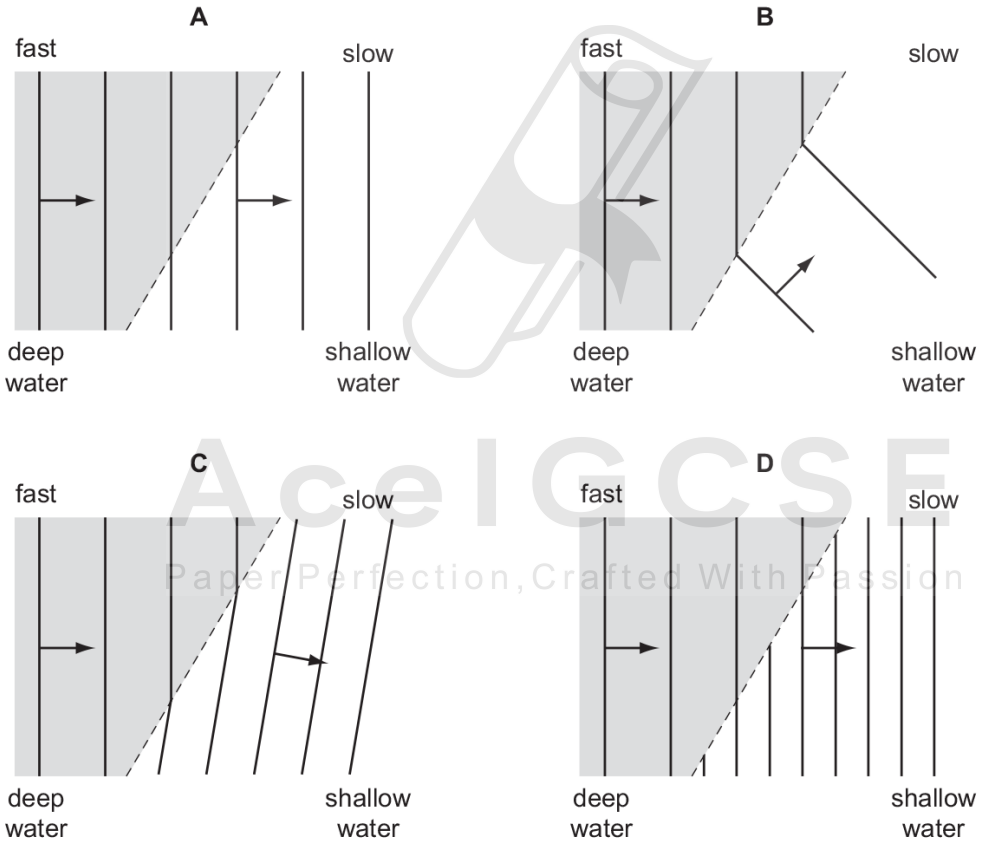
12. 0625_p20_qp_20 Q: 24

The diagrams show water waves that move more slowly after passing into shallow water.

Which diagram shows what happens to the waves?



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13. 0625_s20_qp_21 Q: 20

A wave of frequency 6600 Hz travels 1320 m in 4.0 s.

What is the wavelength?

A 0.050 m **B** 0.80 m **C** 1.3 m **D** 20 m

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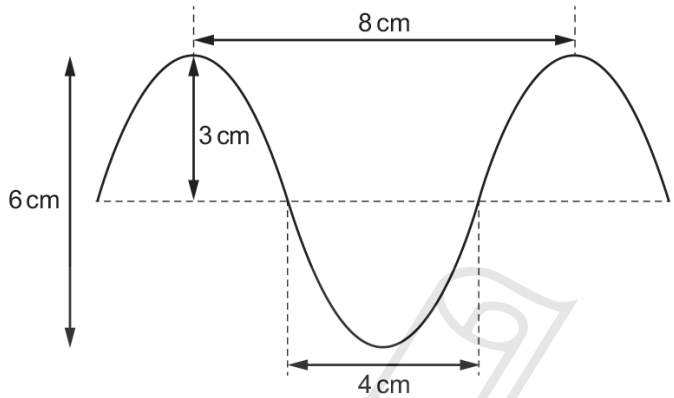
14. 0625_s20_qp_21 Q: 21

The diagram shows a wave.



What are the amplitude and the wavelength of this wave?

	amplitude / cm	wavelength / cm
A	3	4
B	3	8
C	6	4
D	6	8

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15. 0625_s20_qp_22 Q: 21

The frequency of the microwaves used in a microwave oven is 2400 MHz.

What is the wavelength of these microwaves?

A 0.125 m **B** 8.00 m **C** 125 m **D** 7200 m

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16. 0625_s20_qp_23 Q: 20

An earthquake-monitoring station records the arrival of 16 complete waves of an earthquake wave in 20 s.

The speed of the earthquake wave is 6.0 km / s.

What is the wavelength of the earthquake wave?

A 1.3×10^{-4} m

B 2.1×10^{-4} m

C 4.8×10^{3} m

D 7.5×10^{3} m

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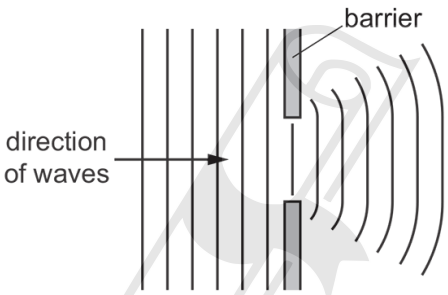
17. 0625_w20_qp_21 Q: 22

The diagram shows part of a diffracted wave pattern.



Changes are made to the wavelength and to the gap size to produce a semicircular diffracted wave pattern.

Which row produces the required semicircular diffracted wave pattern?

	gap in barrier	wavelength
A	larger	same
B	larger	smaller
C	same	larger
D	same	smaller

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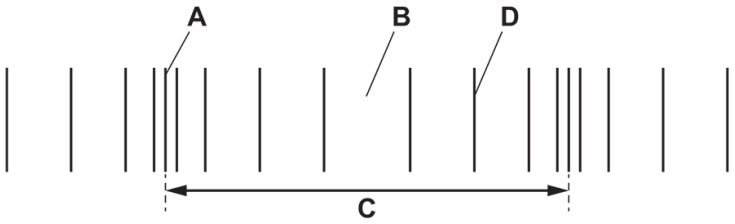
18. 0625_w20_qp_22 Q: 24

A student draws a diagram to illustrate the different sections of a longitudinal wave.

Which labelled section is a rarefaction?



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19. 0625_w20_qp_23 Q: 22

A water wave has a speed of 2.0 m/s.

4.0 complete waves pass a point every 10 seconds.

What is the wavelength of the wave?

A 0.50 m **B** 0.80 m **C** 5.0 m **D** 8.0 m

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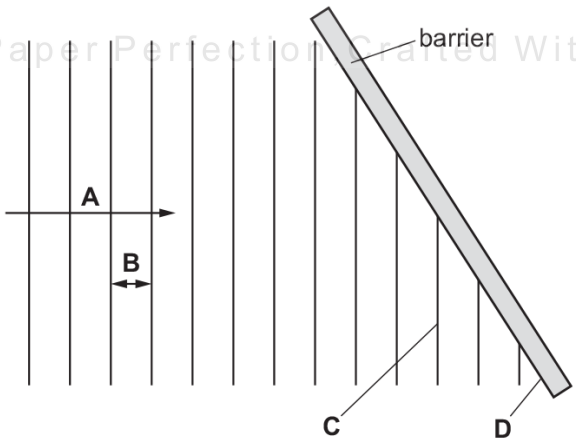
20. 0625_m19_qp_22 Q: 21

The diagram shows a wave before it reflects from a barrier.

Which labelled section of the diagram represents a wavefront?



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21. 0625_m19_qp_22 Q: 22

A vibrating object produces ripples on the surface of a liquid. The object completes 20 vibrations every second. The spacing of the ripples, from one crest to the next, is 3.0 cm.

What is the speed of the ripples?

A 0.15 cm/s **B** 6.7 cm/s **C** 60 cm/s **D** 120 cm/s

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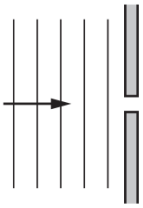
22. 0625_s19_qp_21 Q: 20

When water waves pass through a gap they diffract.

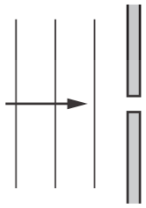
The diagrams show wavefronts approaching a narrow gap.

In which diagram will the diffraction be least?

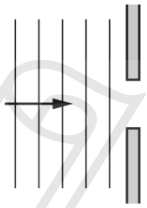
A



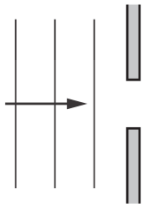
B



C



D



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23. 0625_s19_qp_23 Q: 20

Sound travels through air at a speed of 340 m/s. A source generates sound waves at a frequency of 1.2 kHz.

What is the wavelength of the sound waves?

A 0.28 m **B** 3.5 m **C** 280 m **D** 410 m

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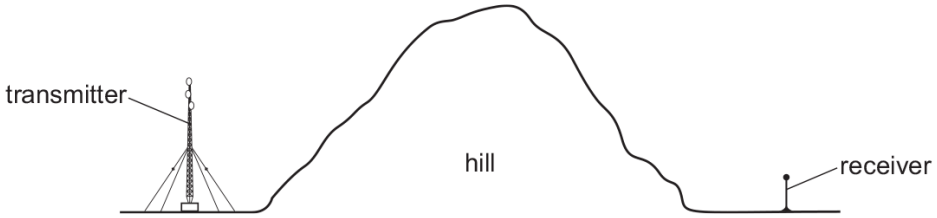
24. 0625_w19_qp_21 Q: 21

A large hill blocks the direct path between a transmitter of radio waves and a receiver, as shown.



The receiver picks up the signal from the transmitter even though the radio waves do not travel through the hill.

Which row is correct?

	A possible way for this to happen is	A stronger signal is received using
A	diffraction round the hill.	longer wavelengths.
B	diffraction round the hill.	shorter wavelengths.
C	refraction round the hill.	longer wavelengths.
D	refraction round the hill.	shorter wavelengths.

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25. 0625_m18_qp_22 Q: 22

Which row shows an example of a transverse wave and an example of a longitudinal wave?

	transverse	longitudinal
A	light	radio
B	radio	sound
C	sound	water
D	water	light

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26. 0625_m18_qp_22 Q: 23

A wave passes through a gap and diffraction causes the wave to spread out.

Which wave spreads out the most?

A large wavelength through a gap slightly larger than the wavelength

B large wavelength through a gap much smaller than the wavelength

C small wavelength through a gap much larger than the wavelength

D small wavelength through a gap much smaller than the wavelength

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27. 0625_s18_qp_21 Q: 19

Light travels at a speed of 2.0×10^8 m/s in a glass block.

In the glass, the wavelength of the light is 4.0×10^{-7} m.

What is the frequency of the light?

A 2.0×10^{-15} Hz

B 1.3×10^{-2} Hz

C 80 Hz

D 5.0×10^{14} Hz

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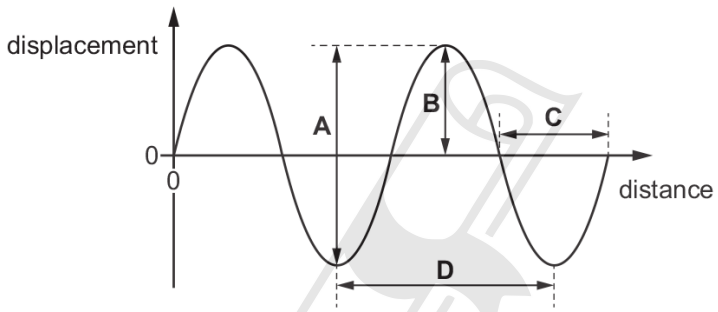
28. 0625_s18_qp_21 Q: 20

Which arrow on the graph shows the amplitude of the wave?



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29. 0625_s18_qp_22 Q: 19

A tank contains water. Ripples are produced on the surface of the water.

What causes the ripples to refract?

A The cold water in the tank is replaced by warm water.

B The ripples change speed as they move from deep to shallow water.

C The ripples hit the wall of the tank.

D The ripples pass through a narrow gap.

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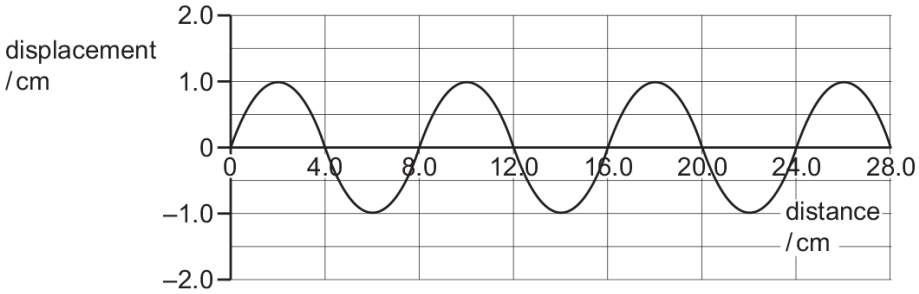
30. 0625_s18_qp_23 Q: 19

The diagram shows a wave.



Which row is correct?

	amplitude of the wave / cm	wavelength of the wave / cm
A	1.0	4.0
B	1.0	8.0
C	2.0	4.0
D	2.0	8.0

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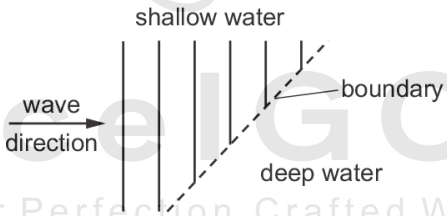
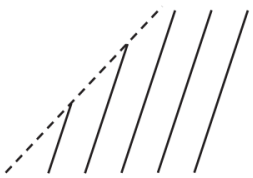
31. 0625_w18_qp_21 Q: 21

21 Plane water waves travel from a shallow region into a deeper region. They travel more quickly in the deeper water.

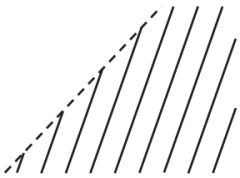


Which diagram shows the wave pattern in the deeper water?

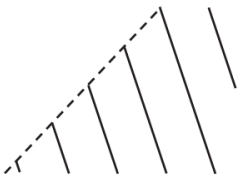
A



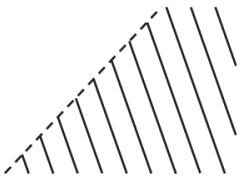
B



C



D



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32. 0625_m17_qp_22 Q: 19

A person uses a surfboard to ride every 30th wave crest towards the beach. The wave crest travels at a speed of 1.6 m/s and the distance between each wave crest is 24 m.

How many wave crests does the person surf in one hour?

A 1 **B** 2 **C** 8 **D** 450

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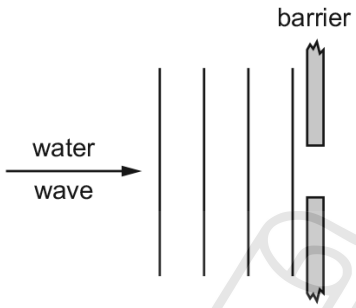
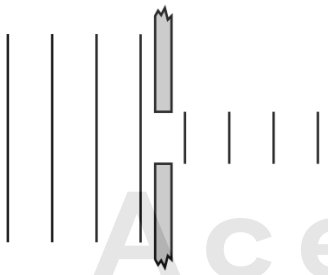
33. 0625_m17_qp_22 Q: 20

In a shallow tank, a water wave moves towards a barrier with a narrow gap.

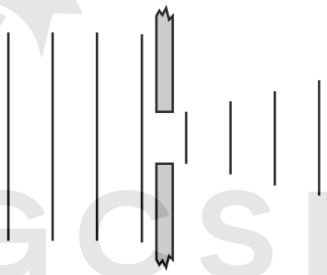


Which diagram shows the wave beyond the barrier?

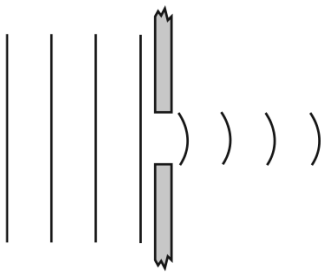
A



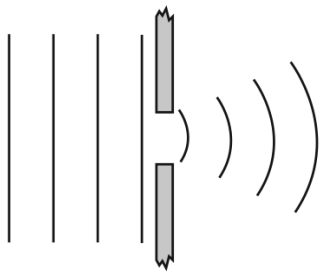
B



C



D



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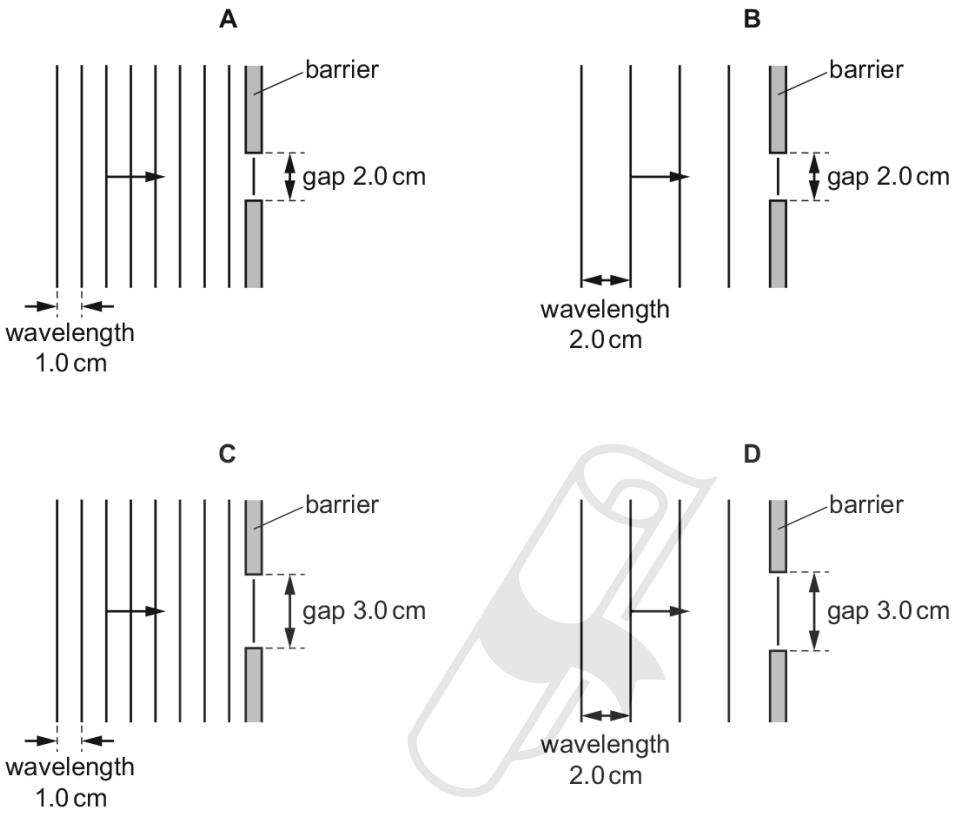
34. 0625_s17_qp_23 Q: 19

Different waves hit barriers with different sized gaps.

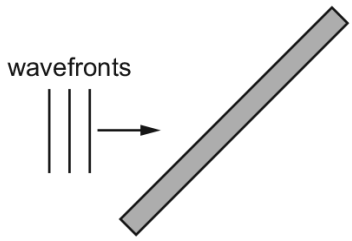
The waves will diffract.

In which diagram does the greatest spreading occur?

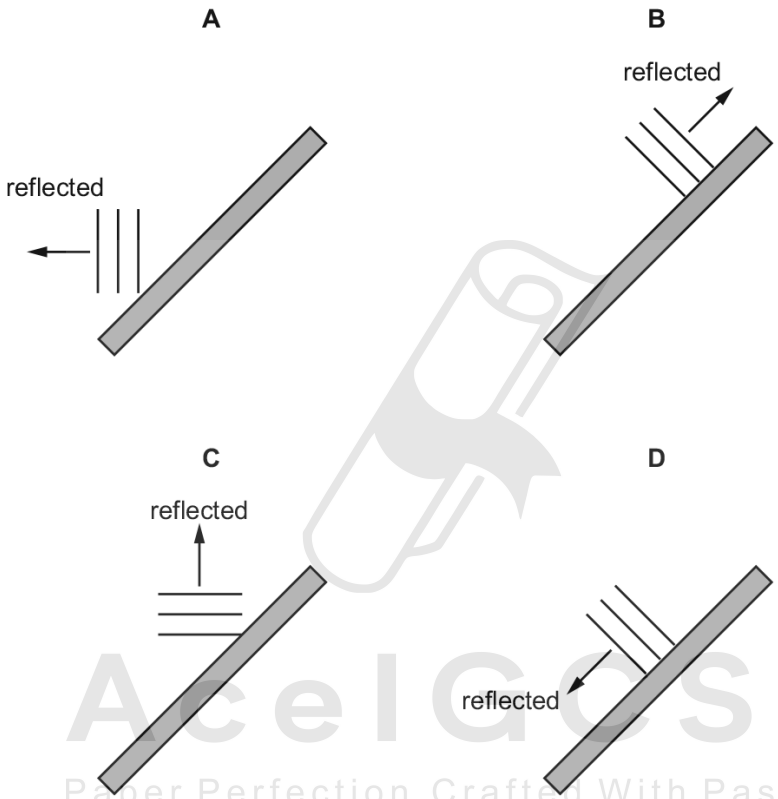


35. 0625_w17_qp_21 Q: 20

The diagram represents plane wavefronts of a water wave about to strike a solid barrier.



Which diagram shows the position of the wavefronts after reflection at the barrier?



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36. 0625_m16_qp_22 Q: 21

Which is a unit of wavelength?

A hertz

B metre

C metre per second

D second

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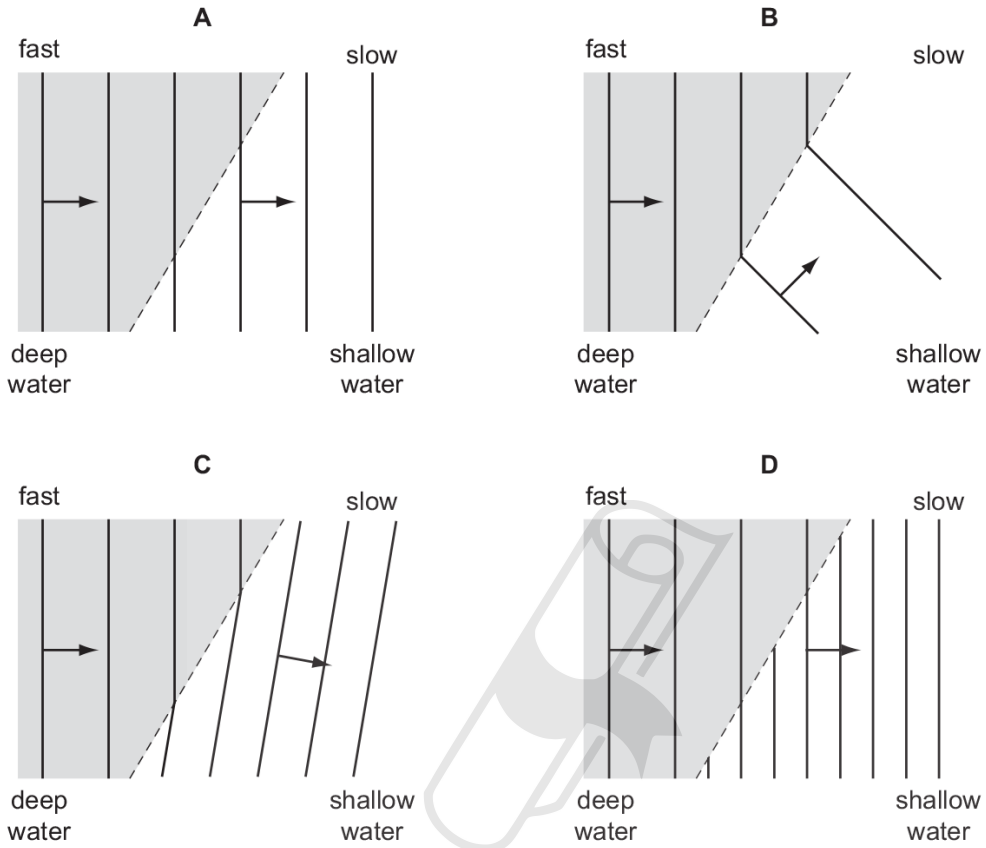
37. 0625_p16_qp_20 Q: 24

The diagrams show water waves that move more slowly after passing into shallow water.

Which diagram shows what happens to the waves?



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38. 0625_s16_qp_21 Q: 21

Which row shows the natures of light waves, sound waves and X-rays?

	light waves	sound waves	X-rays
A	longitudinal	longitudinal	transverse
B	longitudinal	transverse	longitudinal
C	transverse	longitudinal	transverse
D	transverse	transverse	longitudinal

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39. 0625_s16_qp_22 Q: 21

The frequency of a wave is doubled. The speed of the wave does not change.

What happens to the wavelength of the wave?

A It becomes four times as large.

B It does not change.

C It doubles.

D It halves.

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40. 0625_s16_qp_23 Q: 20

A water wave passes into a region where the wave travels more slowly.

As it passes into the slow region, what happens to the frequency and what happens to the wavelength of the wave?

	frequency	wavelength
A	decreases	remains the same
B	increases	remains the same
C	remains the same	decreases
D	remains the same	increases

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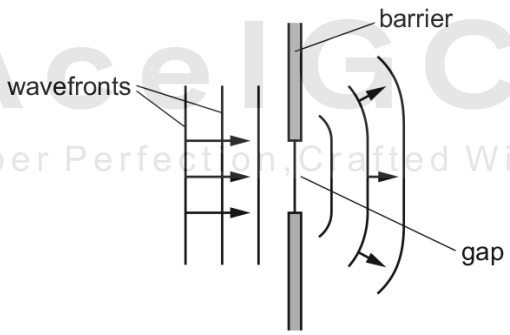
41. 0625_w16_qp_21 Q: 21

The diagram represents plane wavefronts being diffracted by passing through a gap in a barrier.



Which pair of changes **must** increase the amount of diffraction that occurs?

A decrease the wavelength and decrease the size of the gap

B decrease the wavelength and increase the size of the gap

C increase the wavelength and decrease the size of the gap

D increase the wavelength and increase the size of the gap

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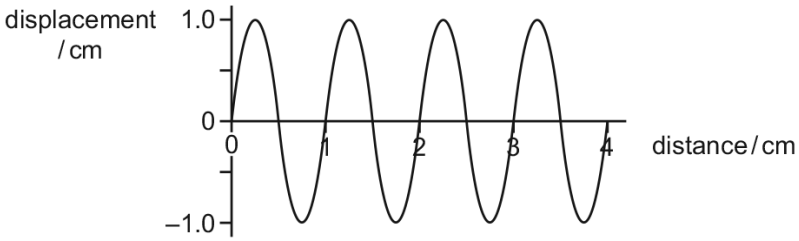
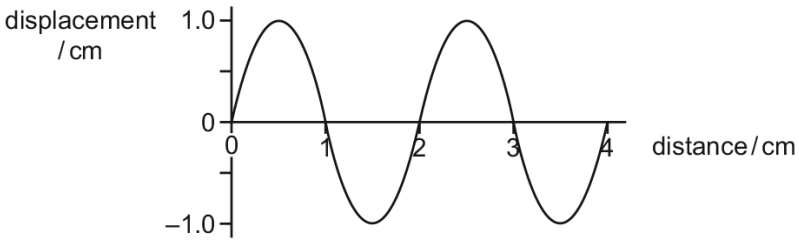
42. 0625_w16_qp_22 Q: 20

Which wave has an amplitude equal to half its wavelength?

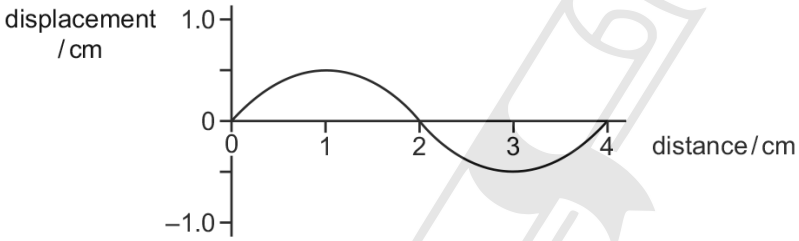
A



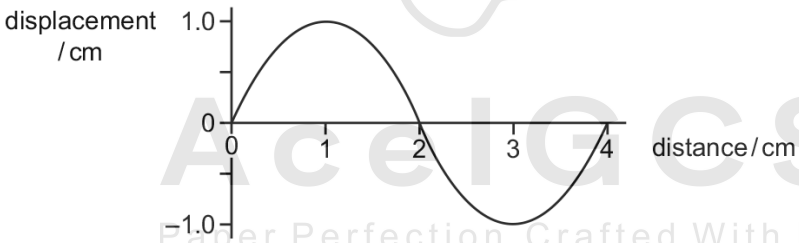
B



C

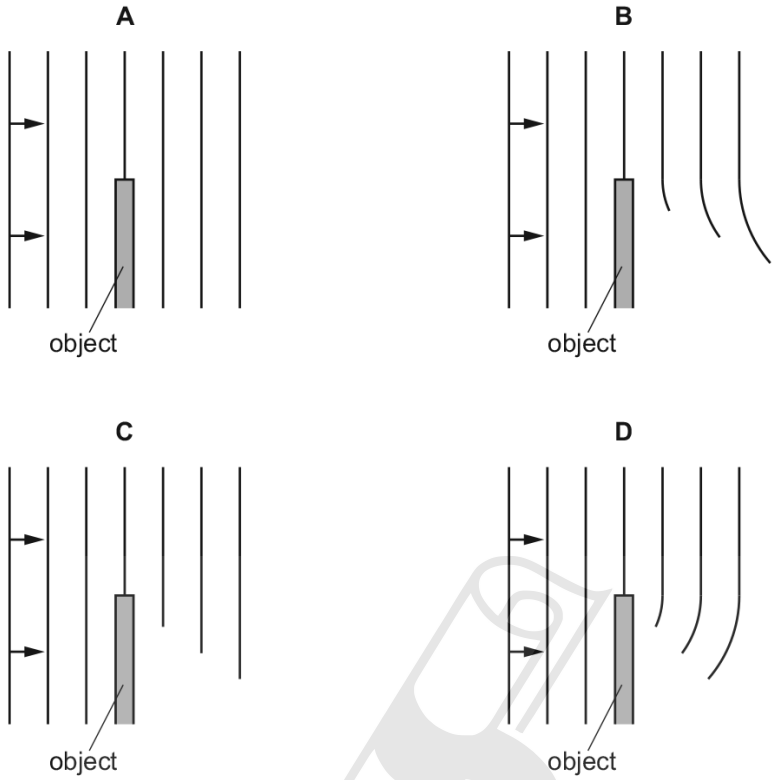


D



43. 0625_w16_qp_22 Q: 21

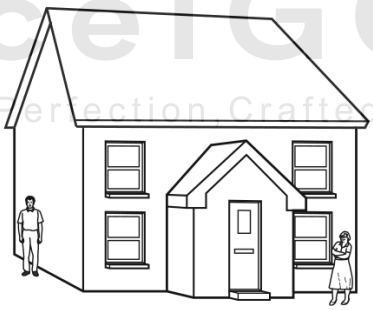
Which diagram shows what happens when plane waves pass the edge of the object shown?



---

44. 0625_w16_qp_23 Q: 20

A man is talking at the side of a house. He can be heard by a woman at the front of the house even though she cannot see him.



What is the explanation for this?

A Sound waves are longitudinal and light waves are transverse.

B Sound waves are transverse and light waves are longitudinal.

C The sound waves have a long wavelength and the light waves have short wavelength.

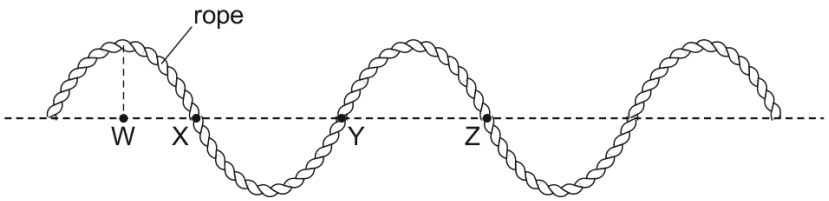
D The sound waves have a short wavelength and the light waves have long wavelength.

---

45. 0625_m15_qp_12 Q: 18

A transverse wave moves along a rope.

The diagram shows the position of the rope at one particular time.



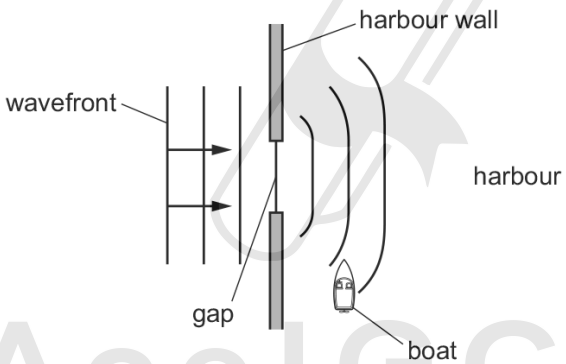
Which two labelled points are one wavelength apart?

A W and X **B** W and Z **C** X and Z **D** Y and Z

---

46. 0625_m15_qp_12 Q: 19

The diagram shows a water wave passing through a gap in a harbour wall. The wavefronts curve round the wall and reach a small boat in the harbour.



What is the name of this curving effect, and how can the gap be changed so that the wavefronts do not reach the boat?

	name of effect	change to the gap
A	diffraction	make the gap slightly bigger
B	diffraction	make the gap slightly smaller
C	refraction	make the gap slightly bigger
D	refraction	make the gap slightly smaller

---

47. 0625_s15_qp_11 Q: 18

What is the number of wavefronts per second that pass a fixed point?

A the amplitude of the wave

B the frequency of the wave

C the speed of the wave

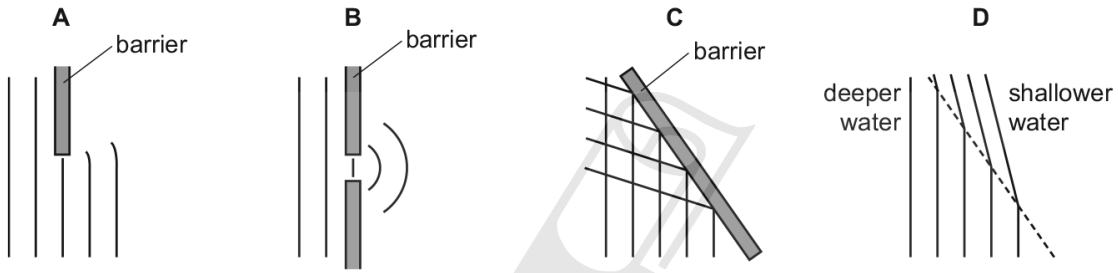
D the wavelength of the wave

---

48. 0625_s15_qp_11 Q: 19

The diagrams represent water waves in a tank.

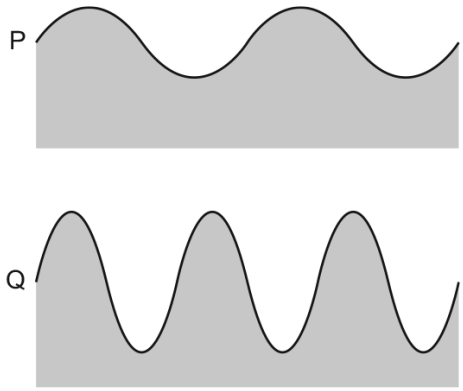
Which diagram represents a wave that changes speed?



---

49. 0625_s15_qp_12 Q: 18

The diagrams show two water waves P and Q that are travelling at the same speed on the surface of a pond. The diagrams are to the same scale.



Which wave has the greater amplitude and which wave has the greater frequency?

	greater amplitude	greater frequency
A	P	P
B	P	Q
C	Q	P
D	Q	Q

---

50. 0625_s15_qp_13 Q: 18

What is the frequency of a wave?

A the distance that a wavefront travels every second

B the distance from one wavefront to the next

C the number of wavefronts produced per second

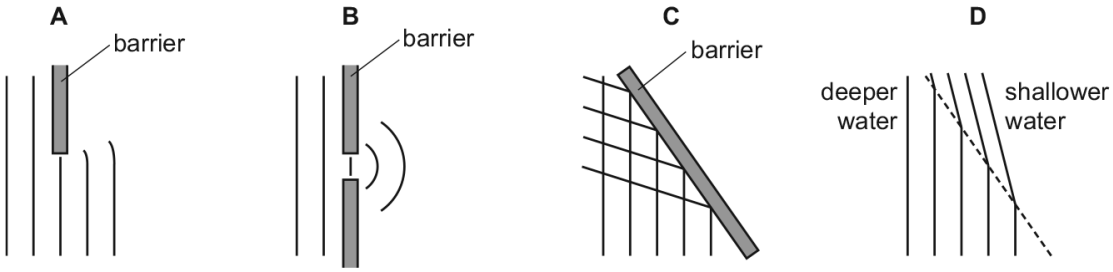
D the time taken for a wavefront to pass a certain point

---

51. 0625_s15_qp_13 Q: 19

The diagrams represent water waves in a tank.

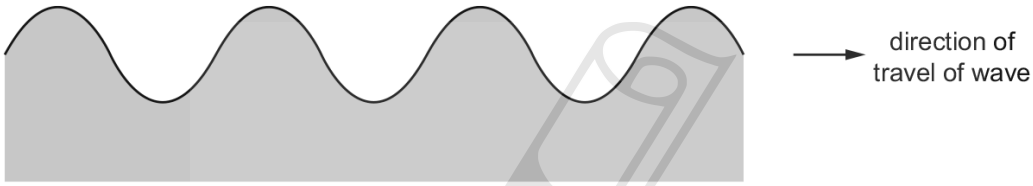
Which diagram represents a wave that changes speed?



---

52. 0625_w15_qp_11 Q: 18

The diagram shows a side view of a water wave at a particular time. The diagram is drawn full size.



Which statement about the wave is correct?

A The wave is longitudinal and the frequency can be measured from the diagram.

B The wave is longitudinal and the wavelength can be measured from the diagram.

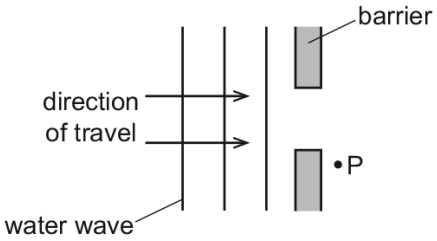
C The wave is transverse and the frequency can be measured from the diagram.

D The wave is transverse and the wavelength can be measured from the diagram.

---

53. 0625_w15_qp_11 Q: 19

The diagram shows a water wave approaching a barrier with a gap.



The wave reaches point P.

What is the name of the effect that causes the wave to reach point P?

A diffraction

B dispersion

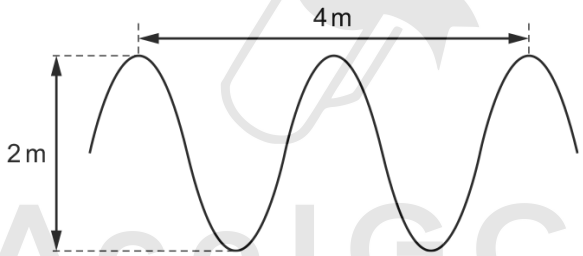
C reflection

D refraction

---

54. 0625_w15_qp_12 Q: 18

The diagram represents a water wave.



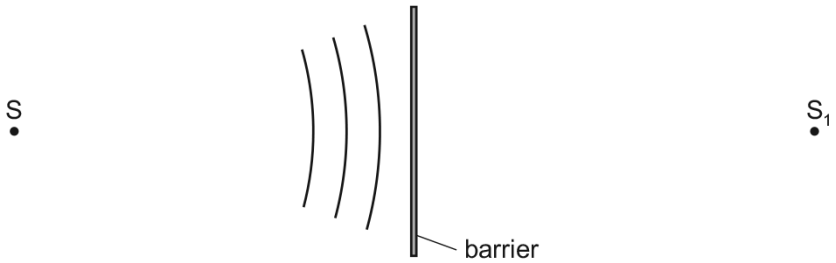
Which row shows the amplitude and the wavelength of the wave?

	amplitude / m	wavelength / m
A	1	2
B	1	4
C	2	2
D	2	4

---

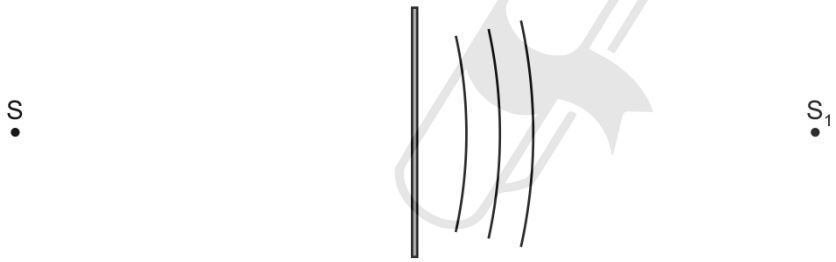
55. 0625_w15_qp_12 Q: 19

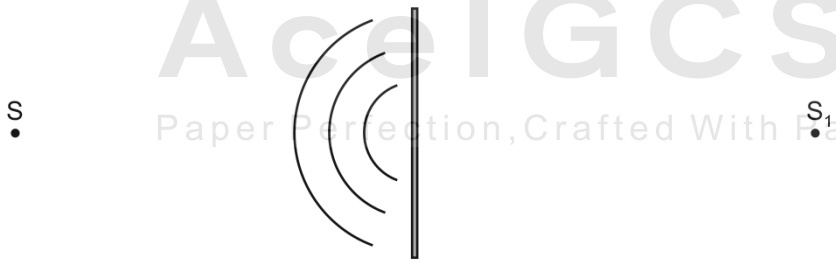
The diagram represents circular wavefronts coming from point S. The wavefronts strike a barrier and are reflected so that they appear to come from point S_1.

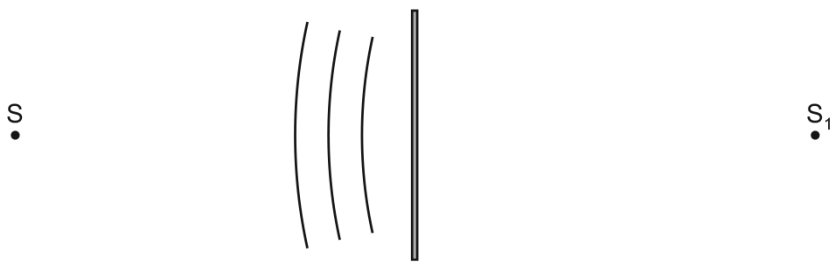


Which diagram shows the reflected wavefronts?

A 

B 

C 

D 

56. 0625_w15_qp_13 Q: 18

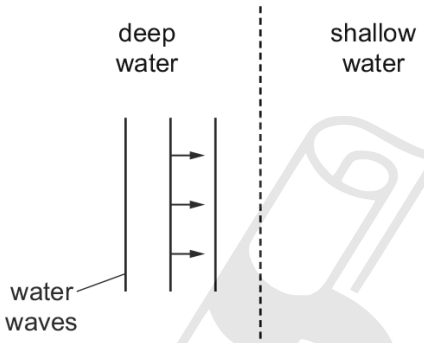
Which row correctly defines a type of wave and gives a correct example?

	wave type	direction of vibrations	example
A	longitudinal	parallel to direction of wave travel	radio waves
B	longitudinal	perpendicular to direction of wave travel	light waves
C	transverse	parallel to direction of wave travel	light waves
D	transverse	perpendicular to direction of wave travel	radio waves

---

57. 0625_w15_qp_13 Q: 19

A water wave moves quickly in deep water.



The wave now enters shallow water and its speed decreases.

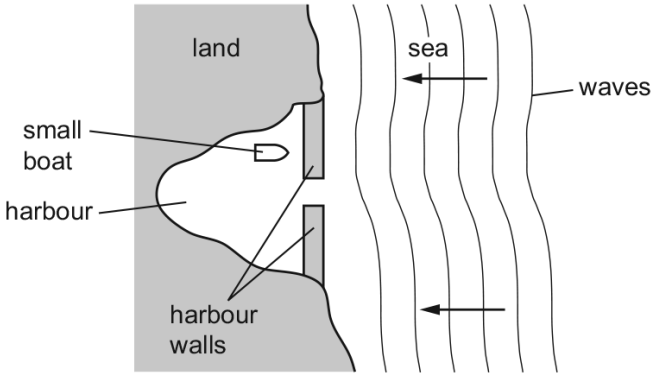
Which row shows what happens to the frequency of the wave, and what happens to the wavelength of the wave?

	frequency	wavelength
A	decreases	decreases
B	decreases	does not change
C	does not change	decreases
D	does not change	does not change

---

58. 0625_s14_qp_11 Q: 19

A small boat in a harbour is protected from waves on the sea by harbour walls.



Some waves can curve round the harbour walls and reach the boat.

What is the name of this effect?

A diffraction

B dispersion

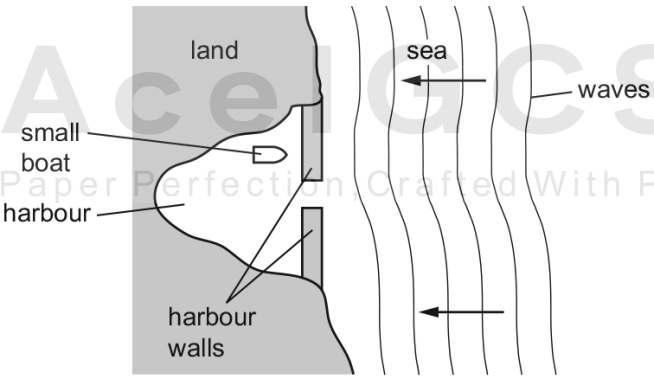
C reflection

D refraction

---

59. 0625_s14_qp_12 Q: 20

A small boat in a harbour is protected from waves on the sea by harbour walls.



Some waves can curve round the harbour walls and reach the boat.

What is the name of this effect?

A diffraction

B dispersion

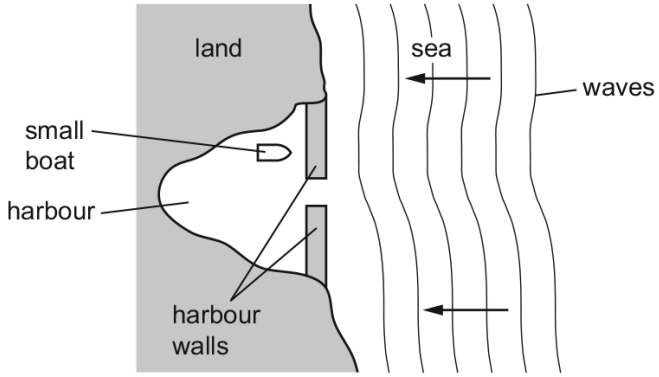
C reflection

D refraction

---

60. 0625_s14_qp_13 Q: 21

A small boat in a harbour is protected from waves on the sea by harbour walls.



Some waves can curve round the harbour walls and reach the boat.

What is the name of this effect?

A diffraction

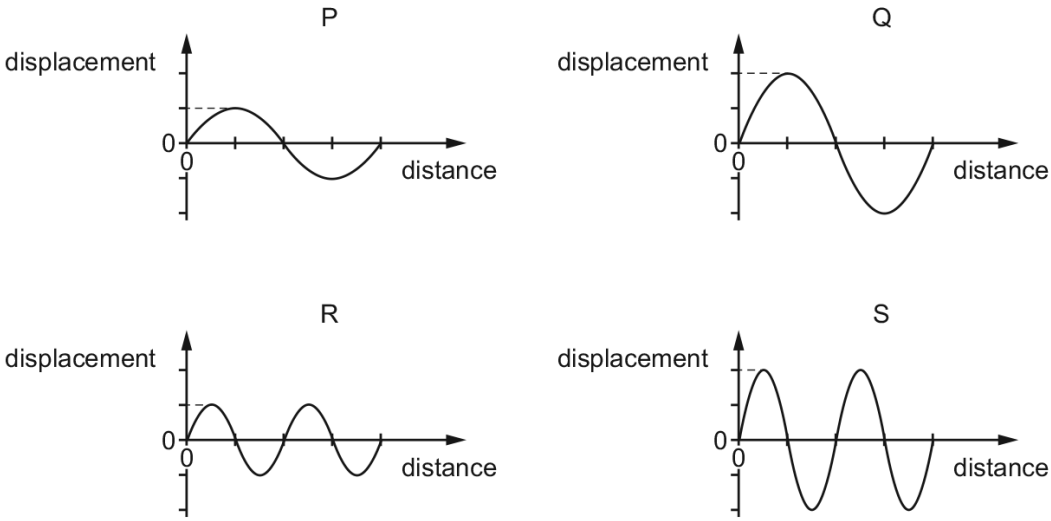
B dispersion

C reflection

D refraction

61. 0625_w14_qp_11 Q: 19

The diagram shows four waves drawn to the same scale.



Which statement is correct?

A The amplitude of wave P is the same as the amplitude of wave R.

B The amplitude of wave S is double the amplitude of wave Q.

C The wavelength of wave Q is double the wavelength of wave P.

D The wavelength of wave S is the same as the wavelength of wave Q.

---

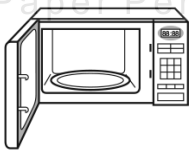
62. 0625_w14_qp_11 Q: 22

Which waves are longitudinal?

A

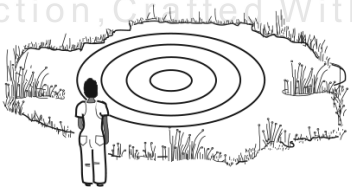
light waves from a lamp

B



microwaves in an oven

C



water waves on a pond

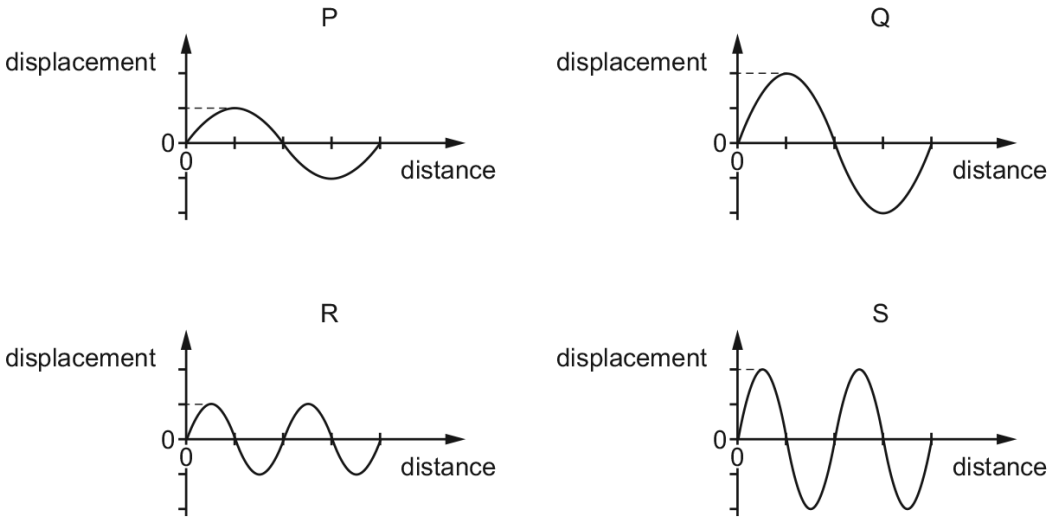
D

sound waves from a trumpet

---

63. 0625_w14_qp_13 Q: 19

The diagram shows four waves drawn to the same scale.



Which statement is correct?

A The amplitude of wave P is the same as the amplitude of wave R.

B The amplitude of wave S is double the amplitude of wave Q.

C The wavelength of wave Q is double the wavelength of wave P.

D The wavelength of wave S is the same as the wavelength of wave Q.

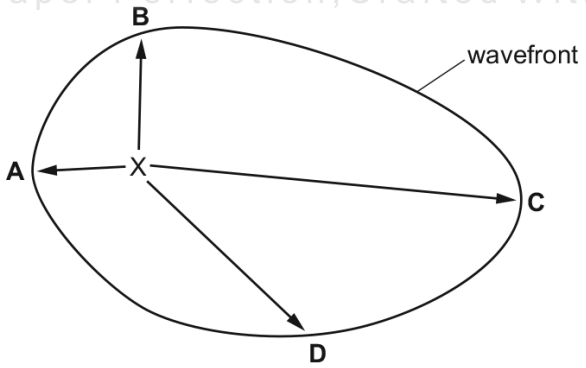
---

64. 0625_w14_qp_13 Q: 20

Waves travel more quickly on the surface of water when the water is deep.

A stone is dropped at point X into a pool of varying depth. The diagram shows the first wavefront on the surface of the pool.

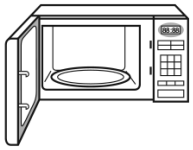
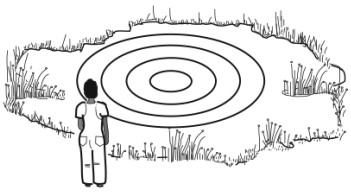
The region between X and which labelled point is likely to be the deepest?



---

65. 0625_w14_qp_13 Q: 22

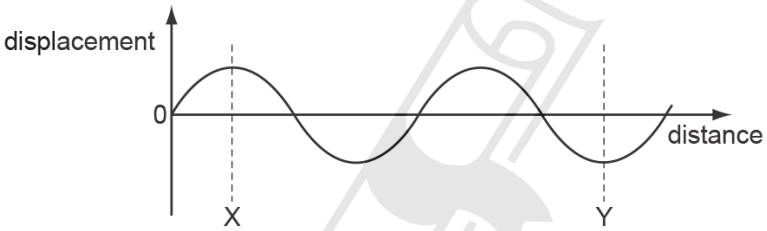
Which waves are longitudinal?

A	B	C	D
			
light waves from a lamp	microwaves in an oven	water waves on a pond	sound waves from a trumpet

---

66. 0625_s13_qp_11 Q: 20

The diagram represents a wave.



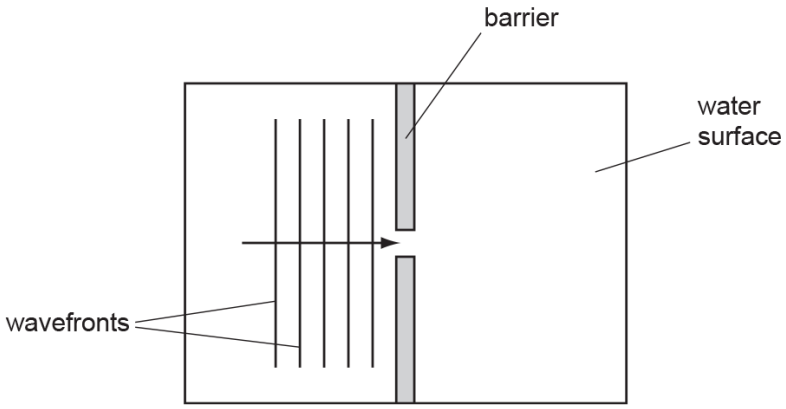
How many wavelengths are there between X and Y?

A $\frac{2}{3}$ **B** 1 **C** $1\frac{1}{2}$ **D** 3

---

67. 0625_s13_qp_12 Q: 19

The diagram shows the surface of water in a ripple tank. A wave is travelling in the direction of the arrow towards a gap in a barrier.



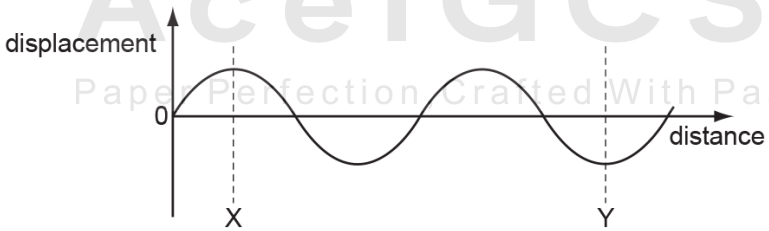
What happens to the wave as it passes through the gap, and what happens to the shape of the wavefronts after passing through the gap?

	what happens at the gap	shape after passing through the gap
A	diffraction	curved
B	diffraction	straight
C	refraction	curved
D	refraction	straight

---

68. 0625_s13_qp_12 Q: 20

The diagram represents a wave.



How many wavelengths are there between X and Y?

A $\frac{2}{3}$ **B** 1 **C** $1\frac{1}{2}$ **D** 3

---

69. 0625_w13_qp_11 Q: 19

Which row shows an example of a transverse wave and an example of a longitudinal wave?

	transverse	longitudinal
A	light	radio
B	radio	sound
C	sound	water
D	water	light

---

70. 0625_w13_qp_11 Q: 20

A boy throws a small stone into a pond. Waves spread out from where the stone hits the water and travel to the side of the pond.

The boy notices that eight waves reach the side of the pond in a time of 5.0 s.

What is the frequency of the waves?

A 0.20 Hz **B** 0.63 Hz **C** 1.6 Hz **D** 40 Hz

---

71. 0625_w13_qp_13 Q: 19

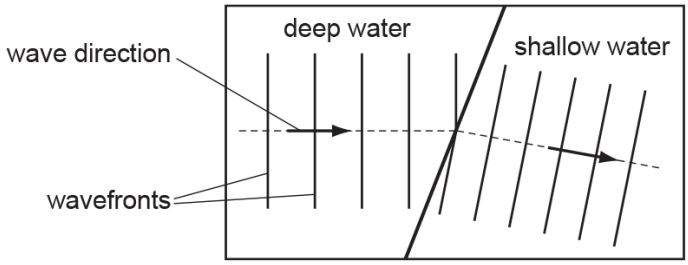
Which row shows an example of a transverse wave and an example of a longitudinal wave?

	transverse	longitudinal
A	light	radio
B	radio	sound
C	sound	water
D	water	light

---

72. 0625_w13_qp_13 Q: 20

Water waves may be used to demonstrate refraction by making them pass into water of a different depth.



Why does the water wave change direction as it passes into the shallow water?

A The frequency of the wave decreases.

B The frequency of the wave increases.

C The speed of the wave decreases.

D The speed of the wave increases.

---

73. 0625_s12_qp_11 Q: 20

What is the unit of wavelength?

A hertz

B metre

C metre per second

D second

---

74. 0625_s12_qp_11 Q: 21

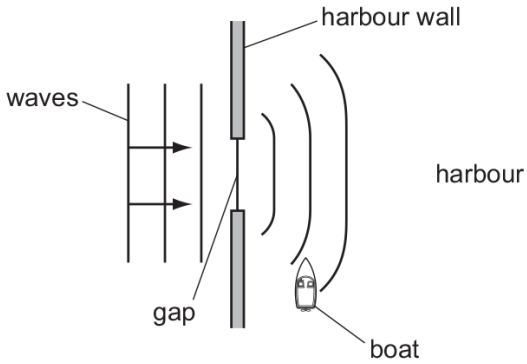
Which row correctly describes light waves and radio waves?

	light waves	radio waves
A	longitudinal	longitudinal
B	longitudinal	transverse
C	transverse	longitudinal
D	transverse	transverse

---

75. 0625_s12_qp_11 Q: 22

The diagram shows water waves passing through a gap in a harbour wall. The waves curve round the wall and reach a small boat in the harbour.



What is the name of this curving effect, and how can the gap be changed so that the waves are less likely to reach the boat?

	name of effect	change to the gap
A	diffraction	make the gap slightly bigger
B	diffraction	make the gap slightly smaller
C	refraction	make the gap slightly bigger
D	refraction	make the gap slightly smaller

---

76. 0625_s12_qp_12 Q: 20

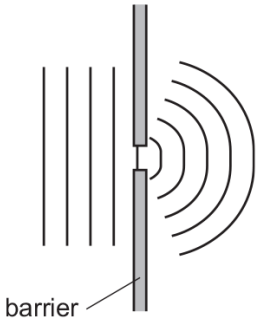
Which row shows the nature of light waves, sound waves and X-rays?

	light waves	sound waves	X-rays
A	longitudinal	longitudinal	transverse
B	longitudinal	transverse	longitudinal
C	transverse	longitudinal	transverse
D	transverse	transverse	longitudinal

---

77. 0625_s12_qp_12 Q: 21

The diagram shows plane water waves passing through a narrow gap in a barrier.



The waves spread out on the far side of the barrier.

Which property of waves does this illustrate?

A diffraction

B reflection

C refraction

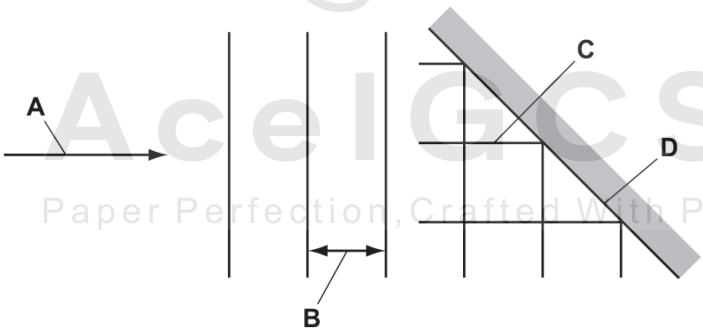
D vibration

---

78. 0625_w12_qp_11 Q: 21

The diagram shows plane waves reflected by a plane surface.

Which line represents a wavefront?



---

79. 0625_w12_qp_11 Q: 22

A swimmer is sitting on a rock at the sea shore looking at passing waves. He notices that five complete wavelengths pass him in 20 s.

What is the frequency of this wave?

A 0.25 Hz **B** 4.0 Hz **C** 15 Hz **D** 100 Hz

---

80. 0625_w12_qp_12 Q: 21

A swimmer is sitting on a rock at the sea shore looking at passing waves. He notices that five complete wavelengths pass him in 20 s.

What is the frequency of this wave?

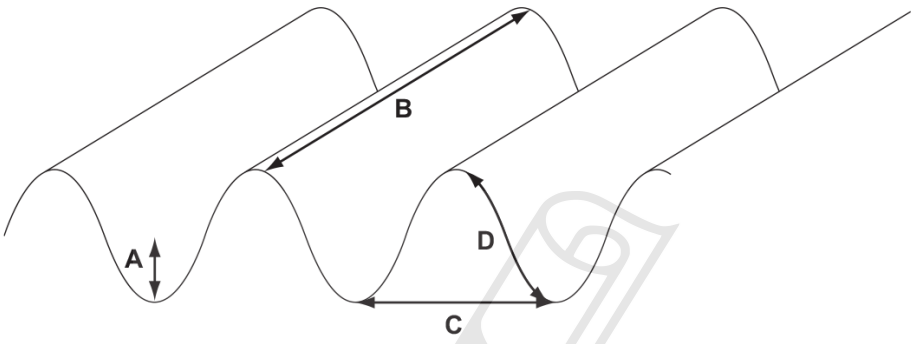
A 0.25 Hz **B** 4.0 Hz **C** 15 Hz **D** 100 Hz

---

81. 0625_w12_qp_13 Q: 21

The diagram shows a water wave in a ripple tank.

Which line represents a wavefront?



SN	Paper	Q. No.	Answer
01	0625_m22_qp_22	21	B
02	0625_m22_qp_22	22	D
03	0625_s21_qp_21	21	C
04	0625_w21_qp_21	17	D
05	0625_w21_qp_21	18	B
06	0625_w21_qp_22	17	C
07	0625_w21_qp_22	18	C
08	0625_w21_qp_23	18	C
09	0625_m20_qp_22	23	A
10	0625_m20_qp_22	24	D
11	0625_m20_qp_22	27	C
12	0625_p20_qp_20	24	C
13	0625_s20_qp_21	20	A
14	0625_s20_qp_21	21	B
15	0625_s20_qp_22	21	A
16	0625_s20_qp_23	20	D
17	0625_w20_qp_21	22	C
18	0625_w20_qp_22	24	B
19	0625_w20_qp_23	22	C
20	0625_m19_qp_22	21	C
21	0625_m19_qp_22	22	C
22	0625_s19_qp_21	20	C
23	0625_s19_qp_23	20	A
24	0625_w19_qp_21	21	A
25	0625_m18_qp_22	22	B
26	0625_m18_qp_22	23	A
27	0625_s18_qp_21	19	D
28	0625_s18_qp_21	20	B
29	0625_s18_qp_22	19	B
30	0625_s18_qp_23	19	B
31	0625_w18_qp_21	21	C
32	0625_m17_qp_22	19	C
33	0625_m17_qp_22	20	D
34	0625_s17_qp_23	19	B
35	0625_w17_qp_21	20	C
36	0625_m16_qp_22	21	B
37	0625_p16_qp_20	24	C
38	0625_s16_qp_21	21	C
39	0625_s16_qp_22	21	D
40	0625_s16_qp_23	20	C
41	0625_w16_qp_21	21	C
42	0625_w16_qp_22	20	B
43	0625_w16_qp_22	21	D
44	0625_w16_qp_23	20	C
45	0625_m15_qp_12	18	C
46	0625_m15_qp_12	19	A
47	0625_s15_qp_11	18	B
48	0625_s15_qp_11	19	D
49	0625_s15_qp_12	18	D

SN	Paper	Q. No.	Answer
50	0625_s15_qp_13	18	C
51	0625_s15_qp_13	19	D
52	0625_w15_qp_11	18	D
53	0625_w15_qp_11	19	A
54	0625_w15_qp_12	18	A
55	0625_w15_qp_12	19	D
56	0625_w15_qp_13	18	D
57	0625_w15_qp_13	19	C
58	0625_s14_qp_11	19	A
59	0625_s14_qp_12	20	A
60	0625_s14_qp_13	21	A
61	0625_w14_qp_11	19	A
62	0625_w14_qp_11	22	D
63	0625_w14_qp_13	19	A
64	0625_w14_qp_13	20	C
65	0625_w14_qp_13	22	D
66	0625_s13_qp_11	20	C
67	0625_s13_qp_12	19	A
68	0625_s13_qp_12	20	C
69	0625_w13_qp_11	19	B
70	0625_w13_qp_11	20	C
71	0625_w13_qp_13	19	B
72	0625_w13_qp_13	20	C
73	0625_s12_qp_11	20	B
74	0625_s12_qp_11	21	D
75	0625_s12_qp_11	22	A
76	0625_s12_qp_12	20	C
77	0625_s12_qp_12	21	A
78	0625_w12_qp_11	21	C
79	0625_w12_qp_11	22	A
80	0625_w12_qp_12	21	A
81	0625_w12_qp_13	21	B