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Fizik
Kertas 1
MEI
2007
1 ¼ jam



**SEKTOR SEKOLAH BERASRAMA PENUH
BAHAGIAN SEKOLAH
KEMENTERIAN PELAJARAN MALAYSIA**

PEPERIKSAAN PERTENGAHAN TAHUN TINGKATAN 5 2007

FIZIK

KERTAS 1

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini mengandungi 50 soalan.*
2. *Jawab semua soalan.*
3. *Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan.*
4. *Bagi setiap soalan hitamkan satu ruangan sahaja.*
5. *Sekiranya anda hendak menukarkan jawapan, padamkan tanda yang telah dibuat.*
6. *Kemudian hitamkan jawapan yang baru*
7. *Satu senarai rumus disediakan di halaman 2*
8. *Penggunaan kalkulator saintifik yang tidak boleh diprogramkan adalah dibenarkan*

Kertas soalan ini mengandungi 30 halaman bercetak

The following information may be useful. The symbols have their usual meaning.

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

2. $a = \frac{v-u}{t}$

3. $s = ut + \frac{1}{2}at^2$

4. Momentum = mv

5. $F = ma$

6. Kinetic Energy = $\frac{1}{2}mv^2$

7. Gravitational Potential Energy = mgh

8. Elastic Potential Energy = $\frac{1}{2}Fx$

9. $\rho = \frac{m}{V}$

10. Pressure in liquid, $P = h\rho g$

11. Pressure, $P = \frac{F}{A}$

12. Heat, $Q = mc\theta$

13. Heat, $Q = m\ell$

14. $\frac{PV}{T} = \text{constant}$

15. $E = mc^2$

16. $v = \lambda f$

17. Power, $P = \frac{\text{Energy}}{\text{Time}}$

18. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

19. $\lambda = \frac{ax}{D}$

20. $n = \frac{\sin i}{\sin r}$

21. $n = \frac{\text{real depth}}{\text{apparent depth}}$

22. $Q = It$

23. $V = IR$

24. Power, $P = IV$

25. $g = 10 \text{ ms}^{-2}$

Each question is followed by **three, four or five** options. Choose the best option for each question then blacken the correct space on the answer sheet.

1. A piece of copper wire is 0.50 m long, and its diameter is 1.52 mm. What is the appropriate instrument that can be used to measure the length and the thickness of the copper wire ?

	Length	Thickness
A	Meter rule	Vernier calipers
B	Meter rule	Micrometer screw gauge
C	Measuring tape	Vernier calipers
D	Vernier calipers	Micrometer screw gauge

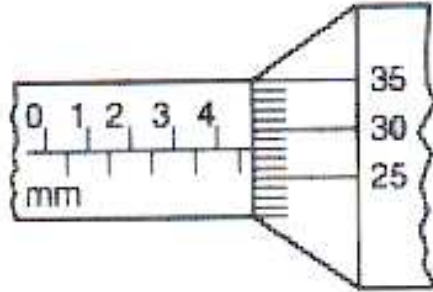
2. Which of the following quantities is a vector quantity ?

- A Mass
- B Speed
- C Work
- D Momentum

3. Which of the following statements about zero error is **true** ?

- A Can be reduced by finding the average reading.
- B Exists in either positive value or negative value.
- C Increases when the range of the scale is larger.
- D Increases when the value of the reading is larger.

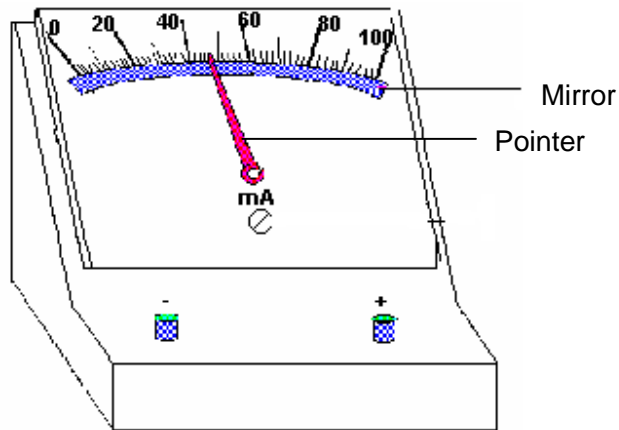
4. The diagram shows part of a micrometer screw gauge.



What is the reading of the micrometer?

- A 4.28 mm
B 4.32 mm
C 4.78 mm
D 4.82 mm
5. A radio station transmitted a radio wave with frequency of 25 MHz. The value of the frequency is equivalent to
- A 2.5×10^{-5} Hz
B 2.5×10^{-2} Hz.
C 2.5×10^4 Hz.
D 2.5×10^7 Hz.
E 2.5×10^9 Hz.

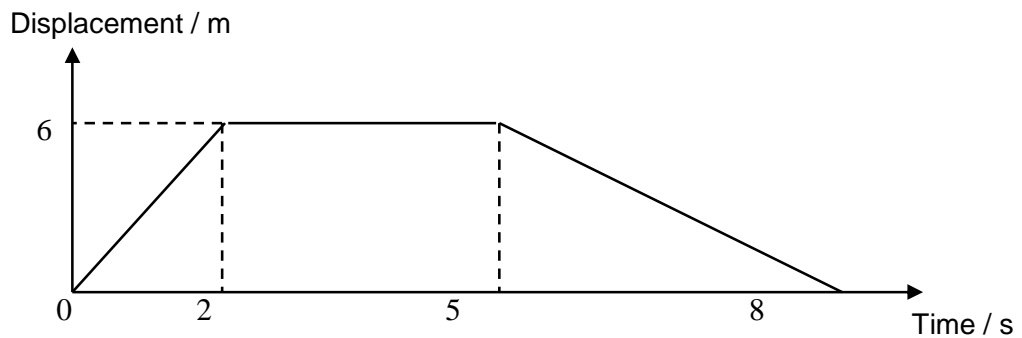
6. The diagram shows an ammeter has a mirror behind the pointer.



What is the function of the mirror?

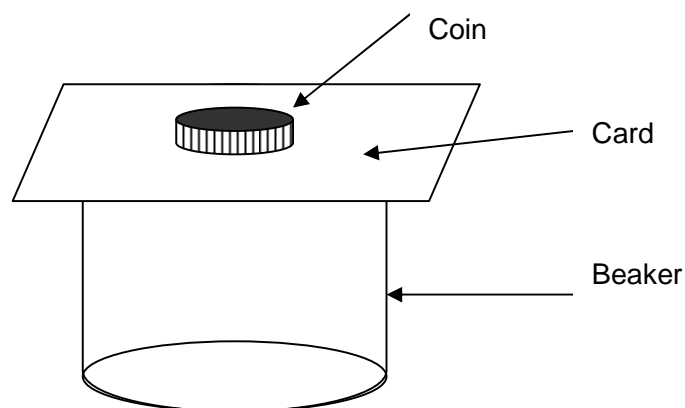
- A Focus the light
- B To avoid parallax error
- C The scale can be brighter
- D The image of pointer becomes bigger

7. The diagram shows a displacement–time graph for the motion of an object.



The momentum of the object is zero from

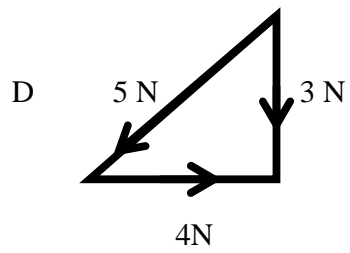
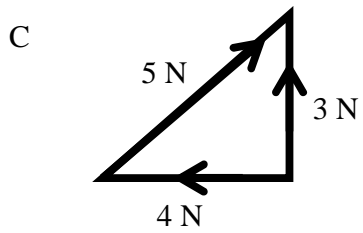
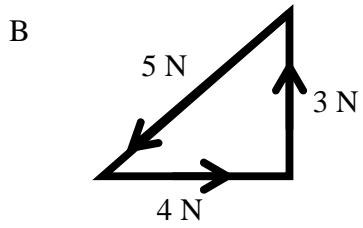
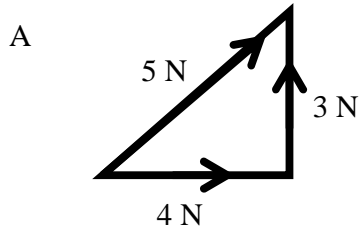
- A. 0 s to 2 s
 - B. 2 s to 5 s
 - C. 5 s to 8 s
 - D. 0 s to 8 s
8. The diagram shows a coin is placed on a cardboard covering the top of a beaker. When the card is quickly pulled horizontally, the coin falls into the beaker.



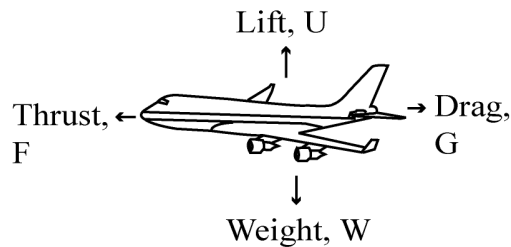
Which property of the coin makes this possible?

- A. Density
- B. Inertia
- C. Volume
- D. Thickness

9. Which diagram **correctly** shows the addition of the 3 N and 4 N forces?

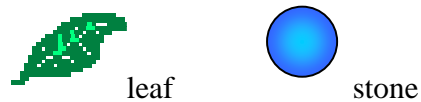


10. The diagram shows an aeroplane flying at a constant velocity.



Which relationship between the forces is **true**?

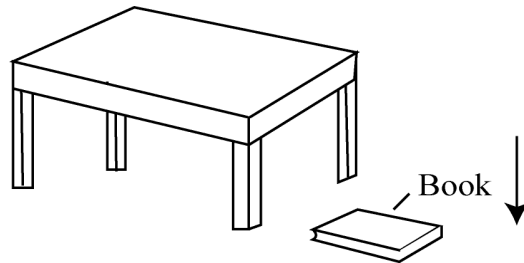
- A $U = W$
B $F > G$
C $U < W$
D $F = G$
11. Diagram shows a leaf and a stone being released at the same time.



Why the stone reaches the ground faster than the leaf?

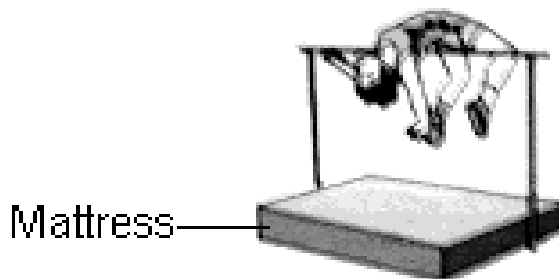
- A The stone has a greater mass.
B Air resistance acted on the stone is smaller.
C The force of gravity acted on the stone is greater than the force of gravity acted on the dried leaf.
D The force of gravity acted on the dried leaf is greater than the force of gravity acted on the stone.

12. The diagram shows a book falling down from a table.



Which physical quantity of the book increases while it is falling?

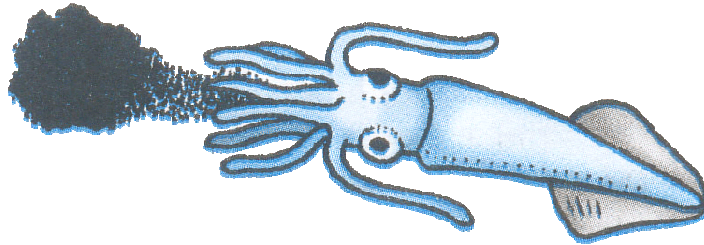
- A mass
 - B momentum
 - C acceleration
 - D potential energy
13. The diagram shows a high-jumper falls on a thick mattress.



The purpose of putting a mattress after the bar is to

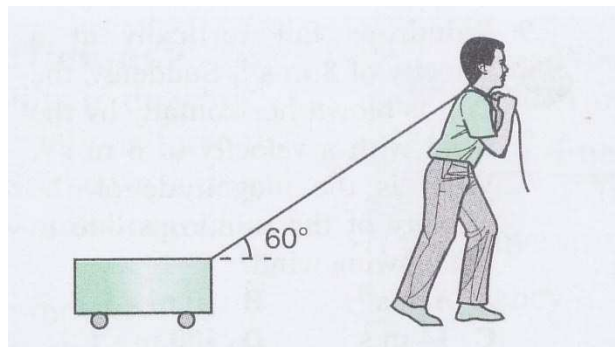
- A decrease the impulsive force
- B decrease the stopping time of the high-jumper.
- C decrease the velocity of the high-jumper.
- D decrease the jumping time of the high-jumper.

14. The diagram shows a squid moving forward by discharging a jet of water from its body.



The forward movement of the squid can be explained by

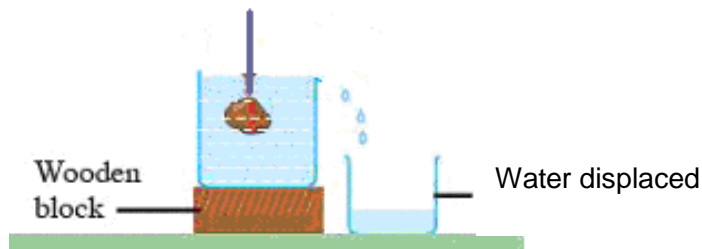
- A conservation of energy
 - B Newton's First Law of motion
 - C conservation of momentum
 - D Newton's second law of motion
15. A student is pulling a trolley with an iron chain which makes an angle of 60° with the horizontal.



If the tension of the spring is $4\,000\text{ N}$, what is the horizontal force?

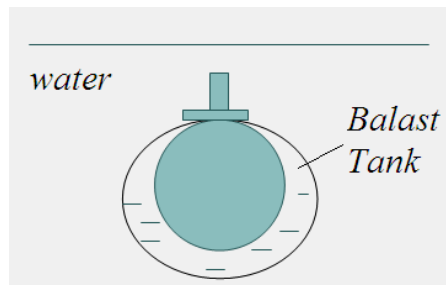
- A $1\,000\text{ N}$
- B $2\,000\text{ N}$
- C $2\,400\text{ N}$
- D $3\,464\text{ N}$.
- E $4\,000\text{ N}$

16. The diagram shows the water was displaced into the small beaker when the steel ball was immersed into the water in the large beaker.



Which principle explains the diagram ?

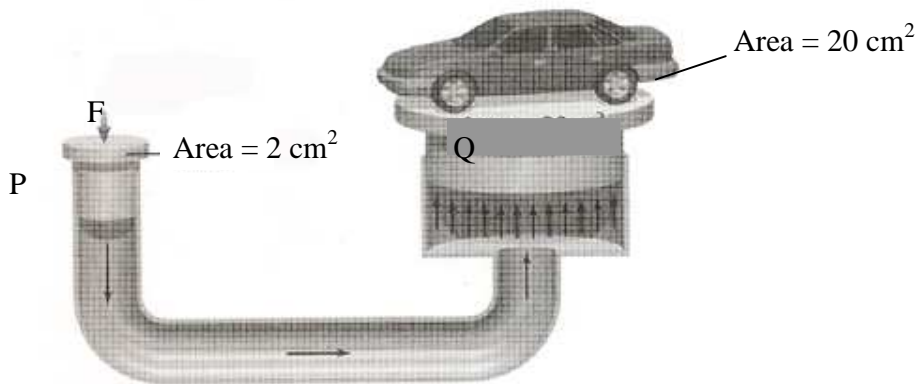
- A Pascal's principle
 - B Bernoulli's principle
 - C Archimedes' principle
17. The diagram shows a submarine.



When water is pumped into the ballast tank, the submarine will sink into the water because

- A weight of submarine < upthrust
- B weight of submarine = upthrust
- C weight of submarine > upthrust

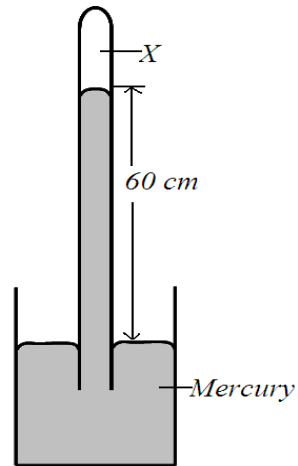
18. The diagram shows a model of hydraulic jack that is used in lifting a toy car.



- When a force, F , is applied on the smaller piston P , the piston will move downward by 5 cm. What is the distance moved by the bigger piston Q ?
- A 0.5 cm
B 2.5 cm
C 5.0 cm
D 25.0 cm
E 50.0 cm
19. Which of the following is the unit of pressure?

- A N
B kg
C g cm^{-3}
D N m^{-2}

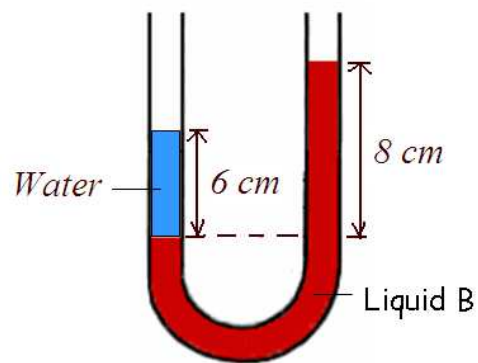
20. The diagram shows a simple mercury barometer.
(The atmospheric pressure is 76 cm Hg)



Space X is

- A a vacuum with a pressure of 0 cm Hg
- B a vacuum with a pressure of 16 cm Hg
- C consists of air with a pressure of 16 cm Hg
- D consists of air with a pressure of 76 cm Hg

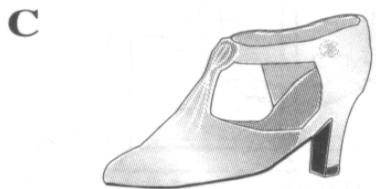
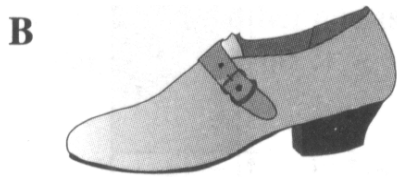
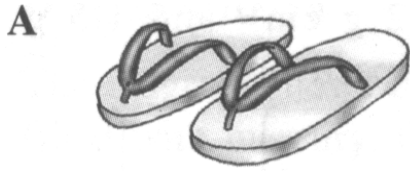
21. The diagram shows a manometer. Liquid B does not mix with water.



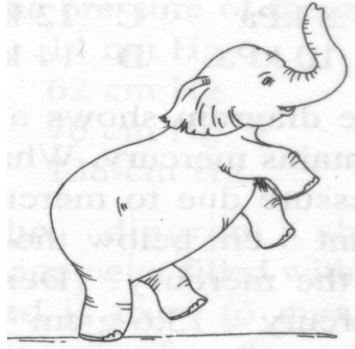
Given that the density of water is $1\,000\text{ kg m}^{-3}$. What is the density of the liquid B?

- A 480 kg m^{-3}
- B 750 kg m^{-3}
- C 800 kg m^{-3}
- D $1\,000\text{ kg m}^{-3}$
- E $1\,200\text{ kg m}^{-3}$

22. Which shoe would exert the greatest pressure on the ground when worn by the same lady?

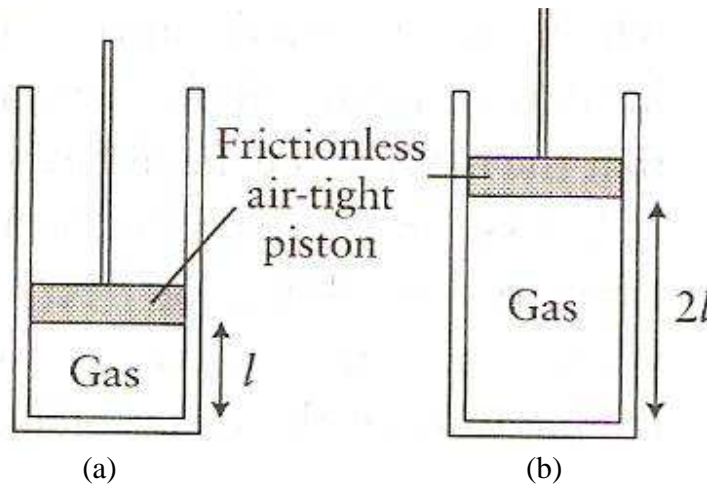


23. The diagram shows an elephant weighing 42 000 N stands on one foot of area 0.1 m^2 .



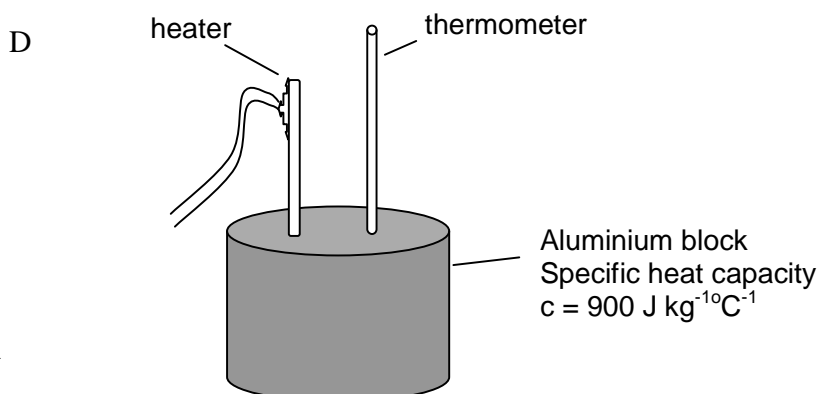
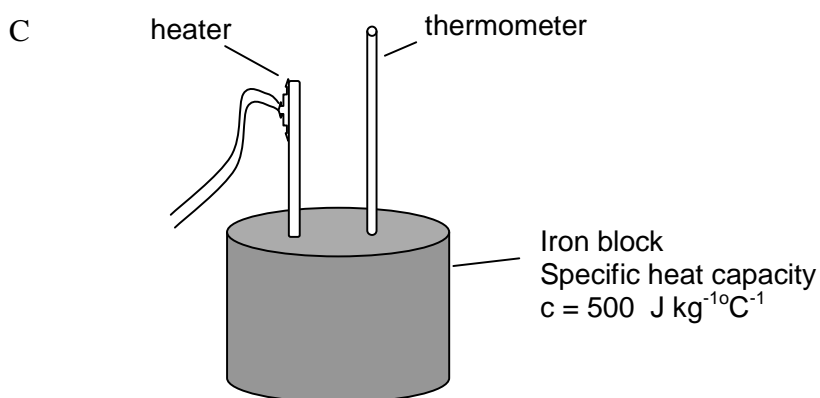
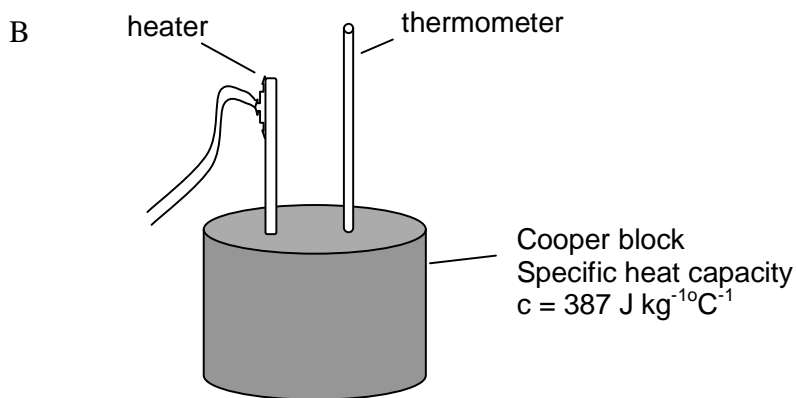
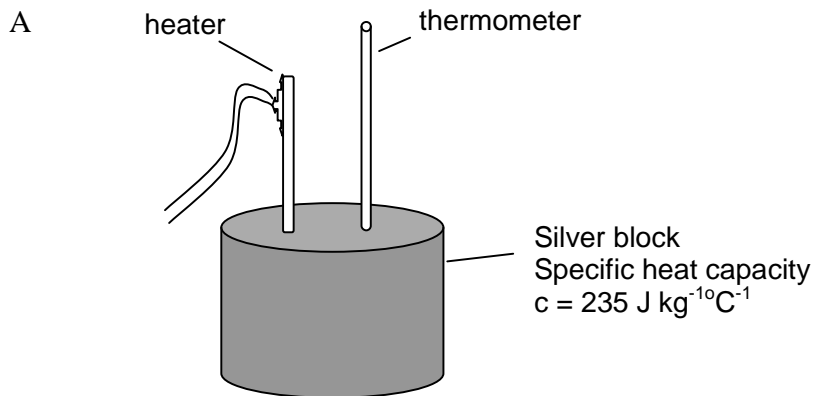
- What is the pressure exerted on the ground by the elephant?
- A 42 Pa
 - B 420 Pa
 - C 42 kPa
 - D 420 kPa
 - E 4 200 kPa
24. Which of the following **does not** take place when two bodies are in thermal equilibrium?
- A The net rate of heat flow is zero
 - B There is no heat flow between two bodies
 - C The temperatures of both bodies are the same
 - D The rates of heat flow between two bodies are the same

25. Diagram (a) shows a cylinder containing gas of 30°C at atmospheric pressure. The length of gas column is l cm .



- When the gas is heated, the length of gas column increase to $2l$ as shown in Diagram (b). What is the final temperature of the gas?
- A 606°C
B 333°C
C 323°C
D 273°C
E 60°C
26. Which of the following statement is the reason for using water as a coolant in the radiator of a car engine?
- A Water is colourless
B Water is a good solvent
C Water is a conductor of electricity
D Water has a high specific heat capacity

27. The diagrams shows four types of metal block of the same mass being heated using the same quantity of heat for 10 minutes. Which metal block shows the highest increase in the temperature ?



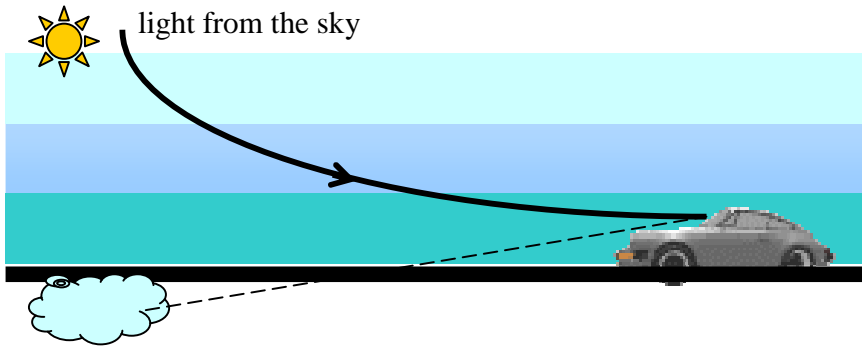
28. What is the quantity which is constant in all the three Gas laws?
- A the number of gas molecules
 - B the distance between the gas molecules
 - C the total force per unit area of the container's wall.
 - D the average kinetic energy of the gas molecule.
29. A 1200 W kettle is filled with 0.5 kg of water at 28°C. It is turned on until the water boils. What is the time taken to boil the water?
(Specific heat capacity of water = $4200 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$)
- A 72 s
 - B 86 s
 - C 126 s
 - D 216 s
 - E 226 s
30. Which of the following instrument is used to measure atmospheric pressure?
- A Manometer
 - B Hydrometer
 - C Bourdon gauge
 - D Barometer aneroid

31. Which of the following phenomenon is related to the total internal reflection?

A



B



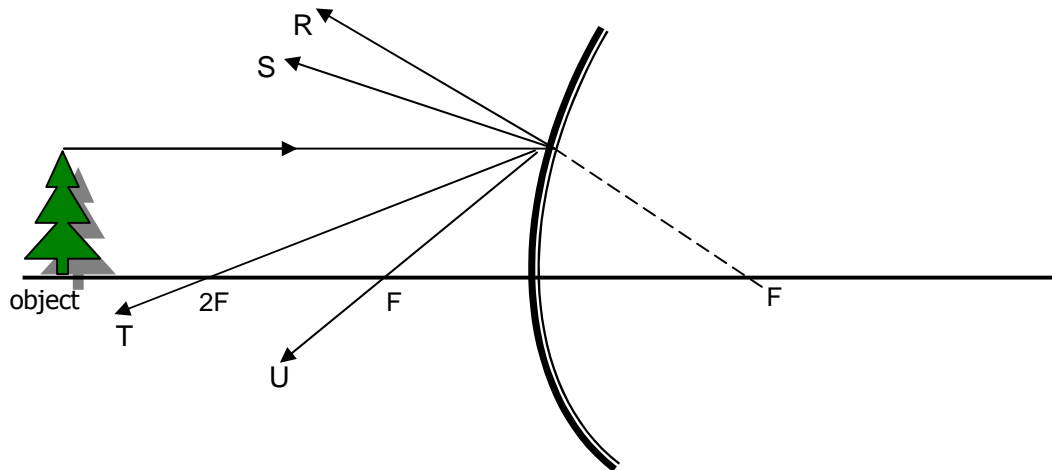
C



D



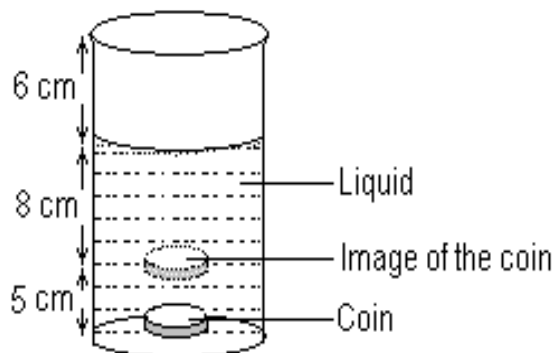
32. The diagram shows an object placed in front of a convex mirror.



Which ray is the **correct** reflected ray?

- A R
 - B S
 - C T
 - D U
33. When a ray of light travel from water to the air, its speed will
- A increase
 - B decrease
 - C remain the same

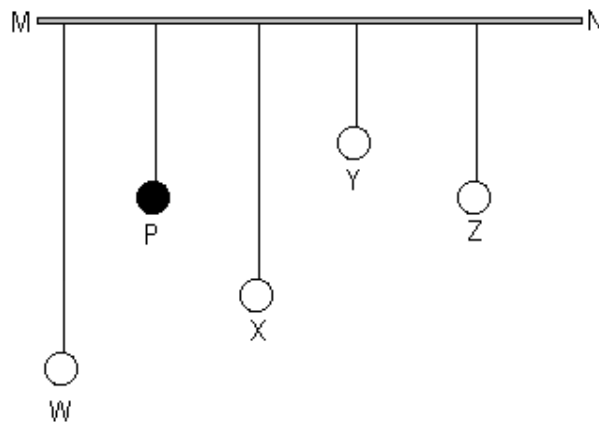
34. Which of the following statement is **correct** in designing a simple astronomical telescope ?
- A Both the focal lengths of the objective lens and the eyepiece lens are the same
- B The focal length of the objective lens is shorter than the focal length of the eyepiece lens
- C At normal adjustment, the distance between the objective lens and the eyepiece lens is longer than the sum of both focal length of the two lenses
- D At normal adjustment, the distance between the objective lens and the eyepiece lens is equal to the sum of both focal length of the two lenses
35. The diagram shows a coin is put at the base of the beaker. The image of the coin appears to be 5 cm from the base of the beaker.



What is the refractive index of the liquid?

- A $\frac{8}{13}$
- B $\frac{5}{8}$
- C $\frac{13}{5}$
- D $\frac{14}{19}$
- E $\frac{19}{14}$

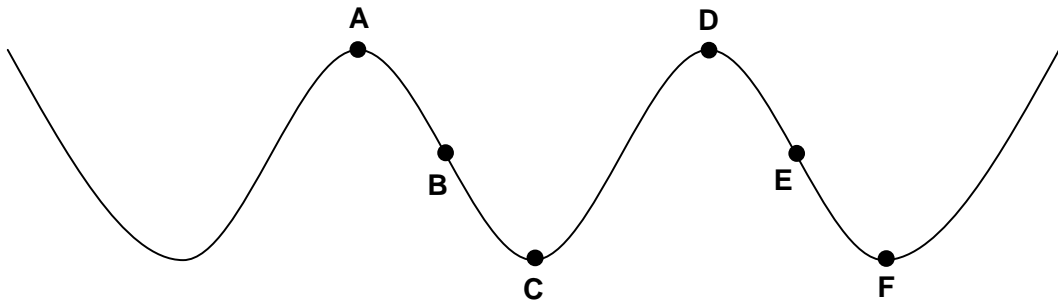
36. A convex lens has a focal length of f cm. The lens produces an enlarged, virtual and upright image. The object distance is
- A less than f
 - B between f and $2f$
 - C same as $2f$
 - D more than $2f$
37. The figure shows five pendulums that are hung along the wire MN. The pendulum P is displaced and then released.



Which of the pendulums will oscillate with the highest amplitude?

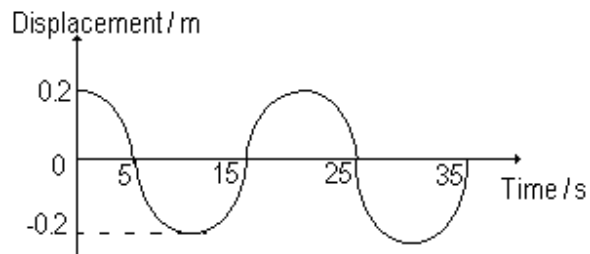
- A Pendulum W
- B Pendulum X
- C Pendulum Y
- D Pendulum Z

38. The diagram shows a type of transverse waves.



Which of the following pair of points is the wavelength of the wave?

- A AC
 - B BD
 - C BE
 - D AF
39. The diagram shows a displacement- time graph of water waves.



Which of the following is **true**?

- A The period of the water wave to vibrate is 25 s
- B The amplitude of the water wave is 0.4 m
- C The frequency of the water wave is 0.05 Hz
- D The wavelength of the water wave is 20 m

40.

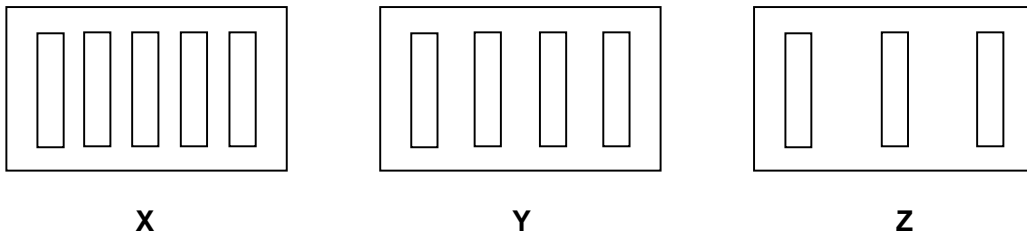
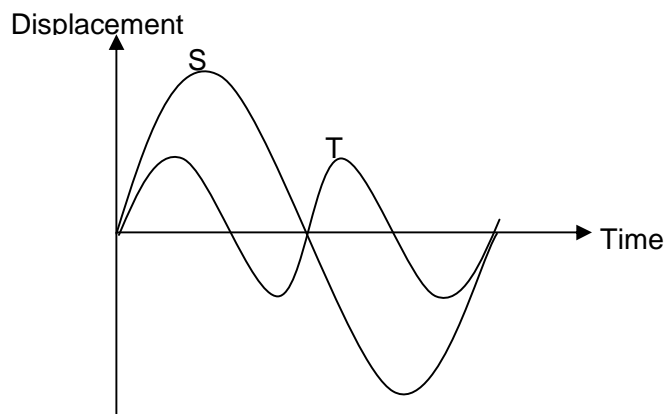


Figure 4

Figure 4 shows diagrams of different fringes are formed on the screens when three different sources of light **X**, **Y** and **Z** are used in Young's double-slit experiment. Which of the following shows the probable sources of light?

- | | X | Y | Z |
|----------|----------|----------|----------|
| A | Green | Yellow | Blue |
| B | Blue | Green | Yellow |
| C | Blue | Yellow | Green |
| D | Yellow | Green | Blue |

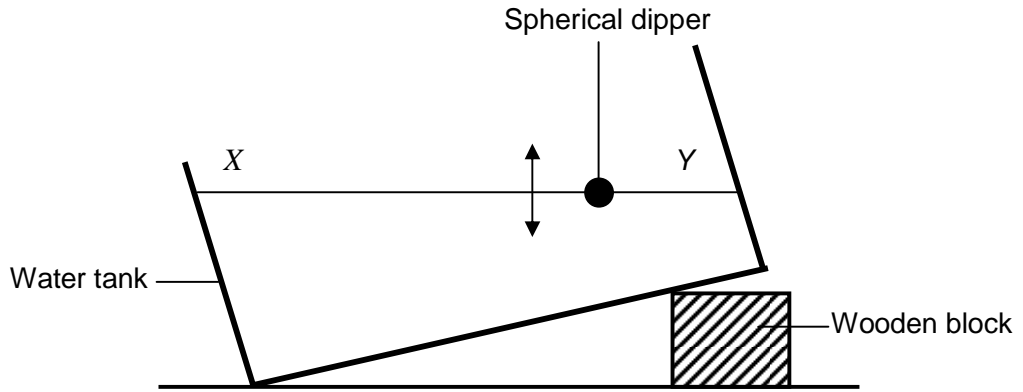
41. The diagram shows a displacement-time graph of two notes **S** and **T**.



Which of the following statement is **true** ?

- A S is louder but has a lower pitch.
- B S is louder and has a higher pitch.
- C T is louder but has a lower pitch.
- D T is louder and has a higher pitch.

42. The diagram shows a spherical dipper is vibrating on the water surface of a tilted water tank



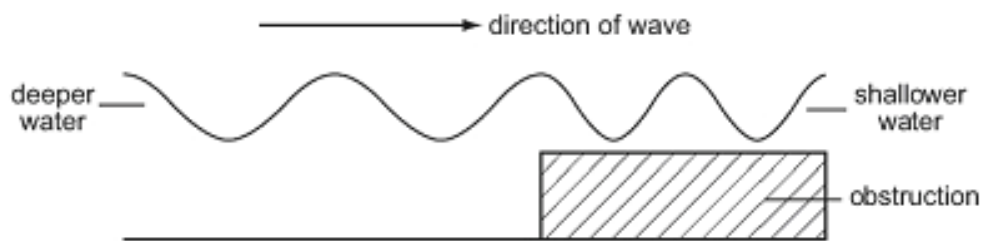
Which of the following wave patterns will be observed in the water tank?

- A
- B
- C
- D

43. A girl can hear the voices of two people talking around the corner but she cannot see these people because

- A Sound waves are reflected better than light waves.
- B Sound waves are refracted better than light waves.
- C Sound waves are diffracted better than light waves.
- D Sound waves are interfered better than light waves.

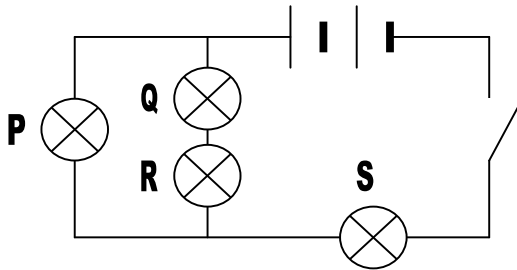
44. Diagram shows a wave moving into shallower water.



The wavelength of the waves is reduced because

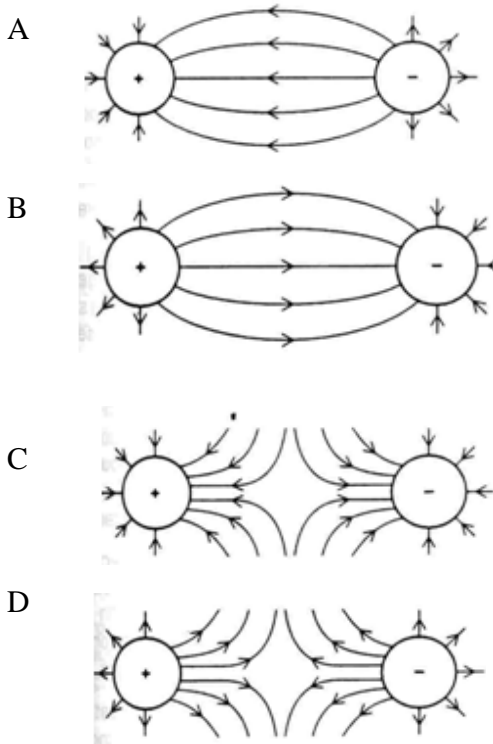
- A frequency and the speed decrease
 - B frequency and the speed increase
 - C the frequency increases
 - D the speed decreases
45. Which of the following material through which the electric charge cannot move easily?
- A conductor
 - B circuit
 - C wire
 - D insulator

46. The diagram shows four identical bulbs, P, Q, R and S are connected to an electric circuit.

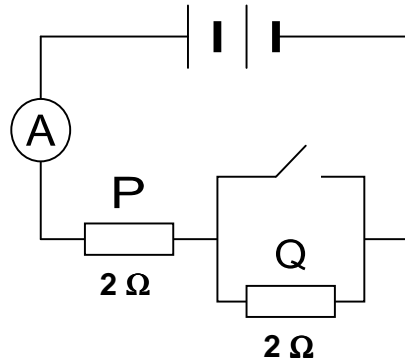


Which of the bulbs in the diagram is the brightest ?

- A P
 - B Q
 - C R
 - D S
47. Which diagram shows the correct electric field pattern between two charged spheres?



48. The diagram shows a simple circuit with 2 resistors P and Q. When the switch is open, the reading of the ammeter is 1.5 A.

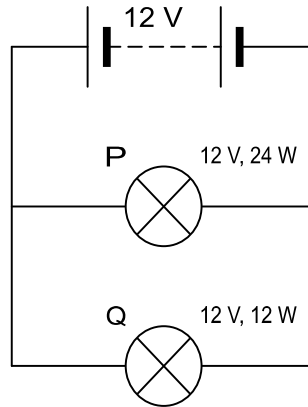


What is the reading of the ammeter when the switch is closed?

- A 0.8 A
B 1.5 A
C 3.0 A
D 4.0 A
E 6.0 A
49. Which of the following changes to a wire when it doubles its resistance?

A	Cross-sectional area double	Length double
B	double	no change
C	halve	halve
D	halve	no change

50. Two bulbs are connected to a 12 V dry cell as shown in the diagram below.



Which of the following statement gives the **correct** explanation?

- A P has a longer filament
- B The resistance of P is lower
- C Less electric current passes through P
- D The potential difference across P is higher

END OF QUESTION