NAME: ______________________________ (   ) CLASS: 3E________

HOUGANG SECONDARY SCHOOL

SEMESTRAL ASSESSMENT 2 / 2019

SCIENCE (PHYSICS) 5076 / 01
PAPER 1 MULTIPLE CHOICE

SECONDARY THREE EXPRESS

Wednesday, 9 October 2019

Total duration for Paper 1 and 2:
1 hour 45 minutes

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READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, glue or correction fluid.
Write your name, register number and class in the spaces at the top of this page and the Answer Sheet (OTAS).

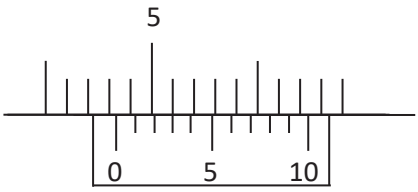
There are **twenty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A, B**, **C** and **D**.
Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet (OTAS).

Answers to Paper 1 and Paper 2 must be handed in separately.
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
You are advised to spend no more than **30 minutes** on **Paper 1**.
You may proceed to answer Paper 2 as soon as you have completed Paper 1.
Any rough working should be done in this booklet.
The use of an approved scientific calculator is expected, where appropriate.

This document consists of **8** printed pages.

[Turn over

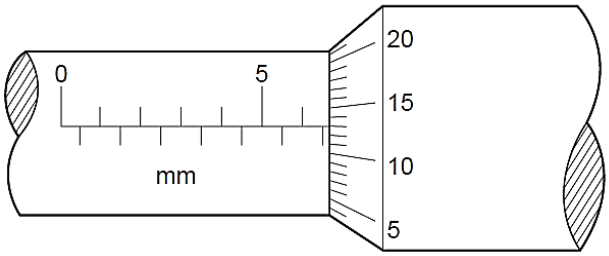
1 The diagram shows the reading of a vernier caliper when measuring the thickness of a wooden plank.



Given that the vernier caliper has a positive zero error of + 0.02 cm, what is the thickness of the wooden plank?

A 4.81 cm **B** 4.83 cm **C** 4.84 cm **D** 4.85 cm

2 A micrometer screw gauge is used to measure the diameter of a thin wire.



What is the diameter of the wire?

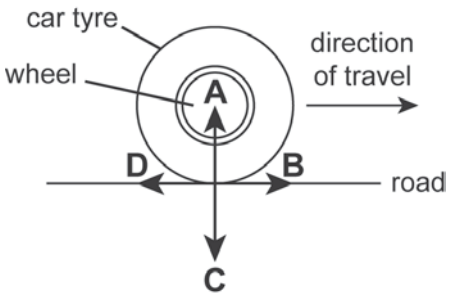
A 5.43 mm **B** 6.13 mm **C** 6.63 mm **D** 8.13 mm

3 Which statement best describes the speed of an object?

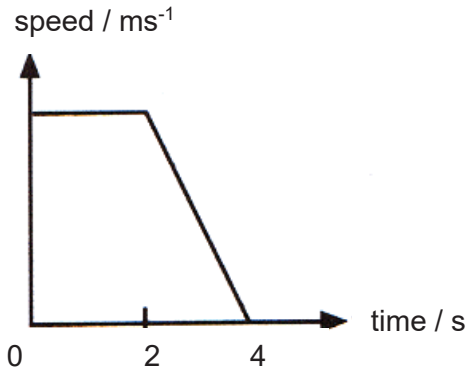
A It is a scalar quantity that consists of magnitude and direction.
B It is the product of the distance and time travelled.
C It is the rate of change of displacement with time.
D It is the rate of change of distance with time.

4 A car is moving in the direction as shown.

Given that its front wheel turns in a clockwise direction, in which direction is the friction exerted by the road on its front wheel?



5 The speed-time graph an object moving in a straight line is shown.



What may be deduced about the resultant force acting on the object from t = 0 to 2 s and t = 2 to 4 s?

	t = 0 to 2 s	t = 2 to 4 s
A	constant	decreasing
B	constant	zero
C	zero	constant
D	zero	decreasing

6 Which of the following has the greatest inertia?

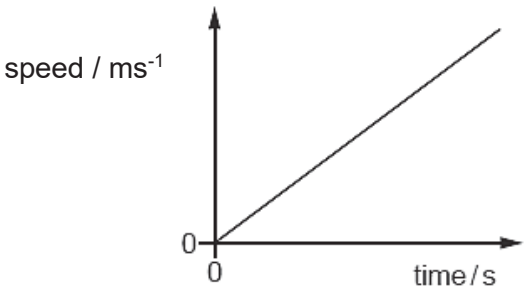
A a bouncing ball with a mass of 600 g
B a galloping horse with a mass of 400 kg
C a running man with a mass of 50.0 kg
D a stationary car with a mass of 1200 kg

7 A boy is trapped on a lake that has frozen at the surface. A man rescues the boy by crawling across the frozen surface rather than by walking across it.

What effect, if any, does crawling across the frozen surface have on the force and pressure exerted on the surface as compared with walking?

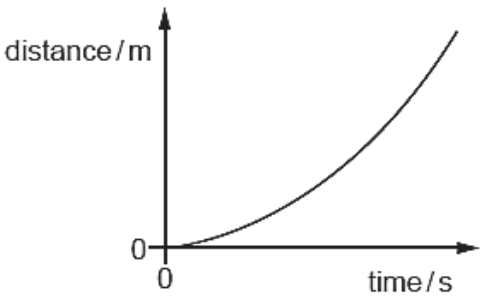
	force	pressure
A	decreased	decreased
B	decreased	increased
C	unchanged	decreased
D	unchanged	increased

8 The diagram shows the speed-time graph of a vehicle.

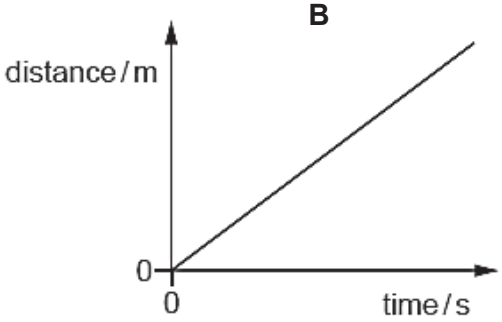


Which of the following shows the corresponding distance-time graph?

A



B



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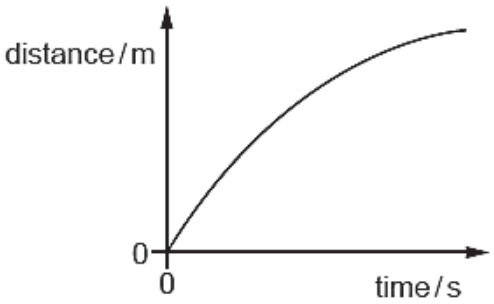
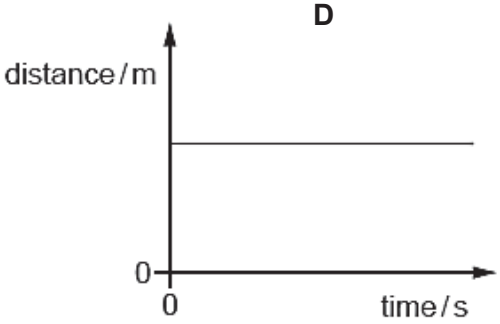


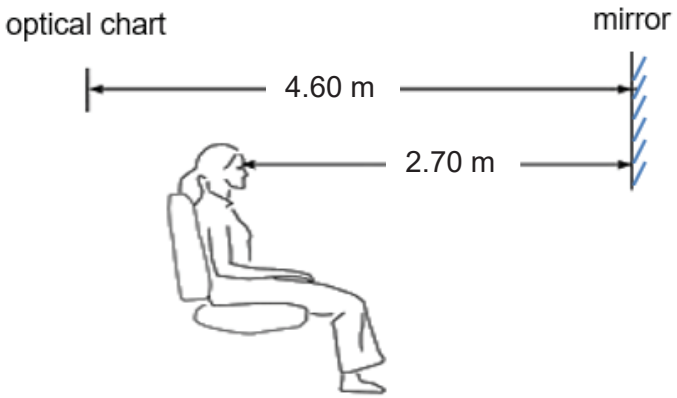
D



9 The gravitational field strengths on Earth and on the moon are 10.0 N/kg and 1.60 N/kg respectively. An object has a weight of 50.0 N on the Earth.
What is its weight on the moon?

A 5.00 N **B** 8.00 N **C** 31.3 N **D** 80.0 N

10 The diagram shows a patient having her eyes tested. An optical chart is placed behind her and she sees the image of the optical chart reflected in a plane mirror.



How far away is the image of the optical chart from the patient's eyes?

A 1.90 m **B** 5.40 m **C** 7.30 m **D** 9.20 m

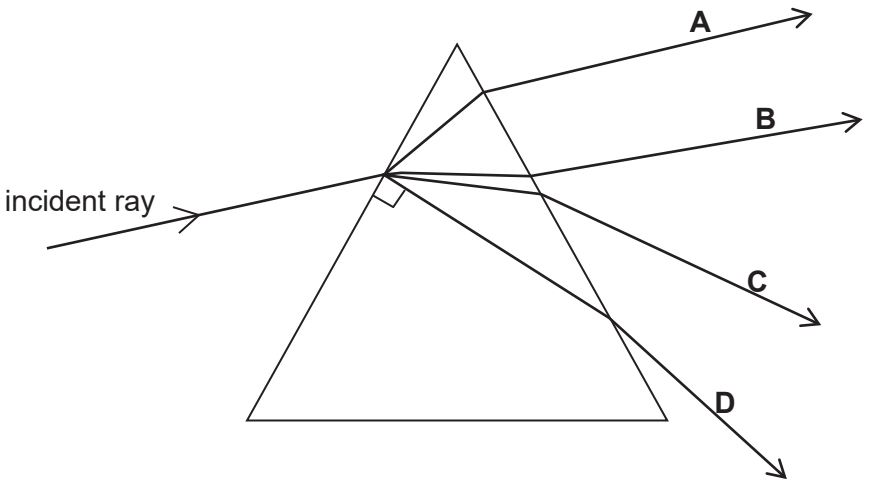
11 Which statement about the image formed by a plane mirror is correct?

A It is real and inverted
B It is real and upright.
C It is virtual and inverted.
D It is virtual and laterally inverted.

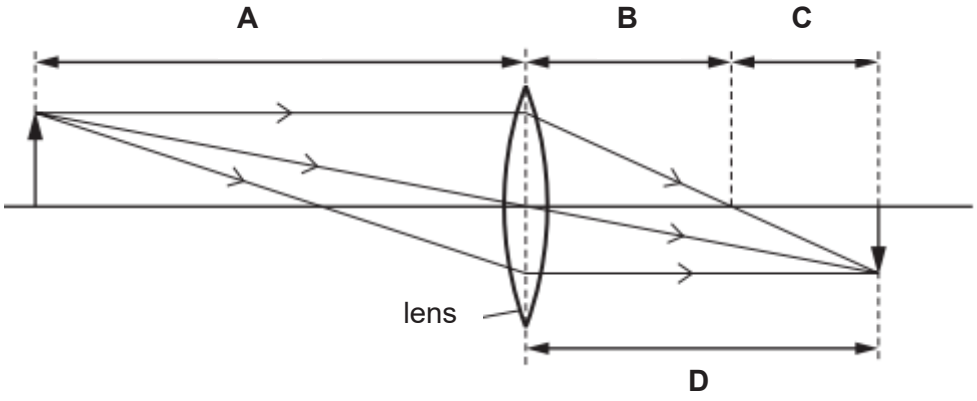
12 The refractive index of material **X** is 2.40.
What is the speed of light in material **X** if it travels at a speed of 3.00×10^8 m/s in vacuum?

A 0.800×10^8 m/s
B 1.25×10^8 m/s
C 2.40×10^8 m/s
D 7.20×10^8 m/s

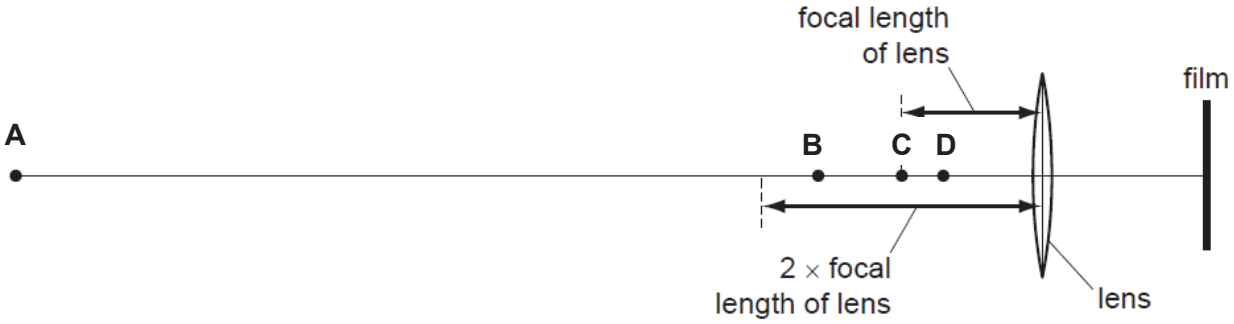
13 A ray of light is incident on one side of a triangular glass prism as shown.
Along which path, **A**, **B**, **C** or **D** would the ray emerge from the prism?



14 The diagram shows an object that is placed in front of a thin converging lens.
Which length correctly represents the focal length of the lens?



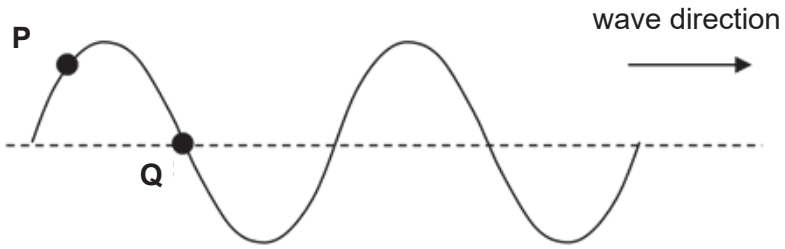
15 The diagram shows a thin converging lens that is used to produce an image on a photo film. At which point should the object be placed in order to obtain a diminished image?



16 Electromagnetic waves can be used for sending television signals to different regions of the world. One method is to send the signals via a satellite in space.
Which of the following electromagnetic waves is used in this method?

A infrared radiation
B microwaves
C radio waves
D ultraviolet radiation

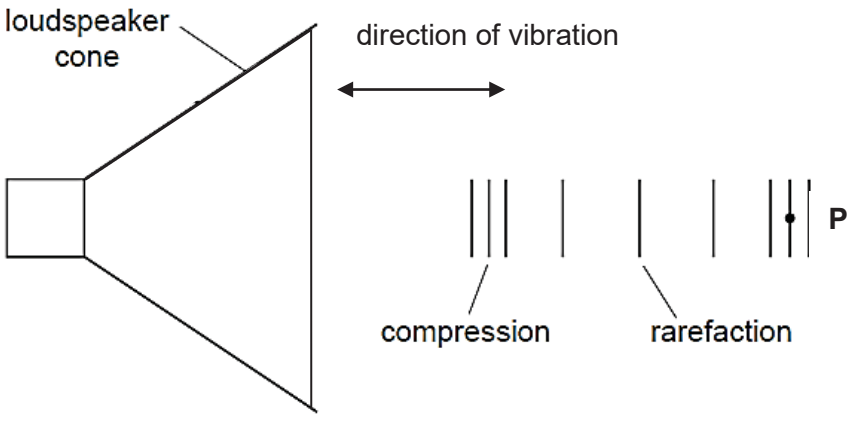
17 The diagram shows rope wave with two particles **P** and **Q** marked. The wave is moving to the right.



What will happen at the next instant?

A **P** will move to the right.
B **P** will move upwards.
C **Q** will move upwards.
D **Q** will not move.

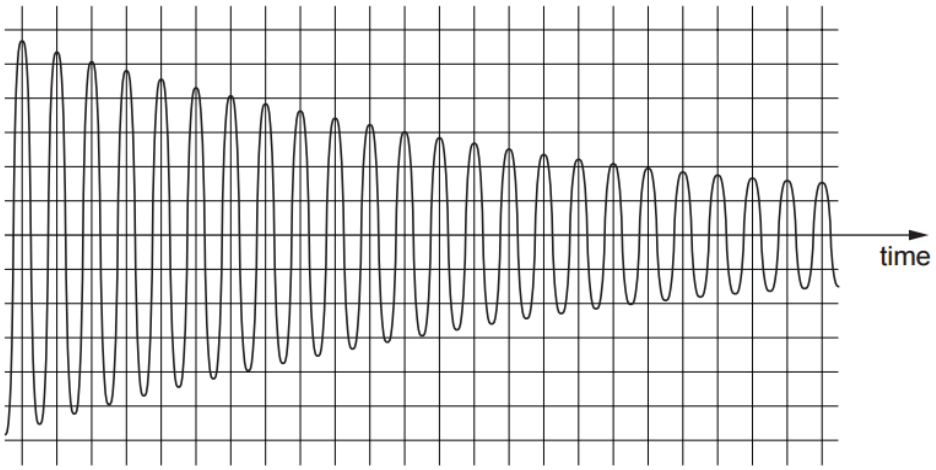
18 Compressions and rarefactions are formed in the air around a loudspeaker cone as it vibrates forward and backward. The frequency of vibration is 50.0 Hz.



How long does it take for the next rarefaction to reach wavefront **P**?

A 0.0100 s **B** 0.0200 s **C** 25.0 s **D** 50.0 s

19 The diagram shows the waveform of a sound that is produced by a bell.



Which of the following correctly shows the change in loudness and pitch of the sound with time?

	loudness	pitch
A	decreased	decreased
B	decreased	unchanged
C	unchanged	decreased
D	unchanged	unchanged

20 A vibrating dipper is used to produce water waves in a ripple tank.
Which of the following occurs when the frequency of the vibration is reduced?

A The amplitude of the waves decreases.
B The period of the waves remains unchanged.
C The speed of the waves decreases.
D The wavelength of the waves increases.

END OF PAPER 1