Class	Register Number	Name

南洋女子中学校

NANYANG GIRLS' HIGH SCHOOL

End-of-Year Examination 2010
Secondary Three

PHYSICS **45 minutes**

Paper 1 Multiple Choice **0845 - 0930**

Monday **18 October 2010**

Additional materials: Multiple Choice Answer Sheet

READ THESE INSTRUCTIONS FIRST

Do not open this booklet until you are told to do so.

Write in soft pencil.
Do not use staples, paper clips, highlighters, glue or correction fluid.
Write your name, class and register number on the Multiple Choice Answer Sheet provided.

There are **thirty** questions in 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 answer sheet.

INFORMATION FOR CANDIDATES

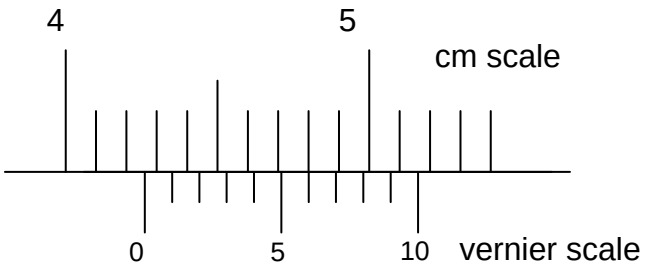
Each correct answer will score one mark. A mark will not be deducted for a wrong answer. Any rough working should be done in this booklet.

Assume g = 10 m/s^2, unless specified otherwise by the question.

1 Which of the following is **not** a base SI unit?

A newton **B** kilogram **C** ampere **D** second

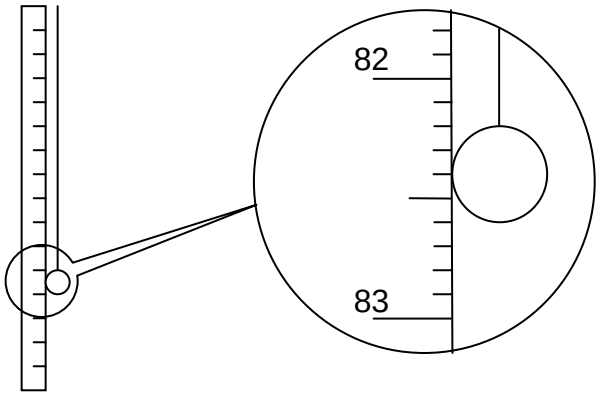
2 The diagram shows an object being measured using a pair of vernier callipers.



What is the reading on the vernier callipers?

A 4.06 cm **B** 4.26 cm **C** 4.84 cm **D** 4.86 cm

3 The length of a pendulum is to be measured with a metre rule.



What is the reading?

A 82.2 cm **B** 82.4 cm **C** 83.4 cm **D** 83.6 cm

4 A student recorded her readings from a micrometer without checking the instrument for zero error.

What possible type of error may affect all of her readings?

A Parallax error

B Random error

C Human reaction time error

D Systematic error

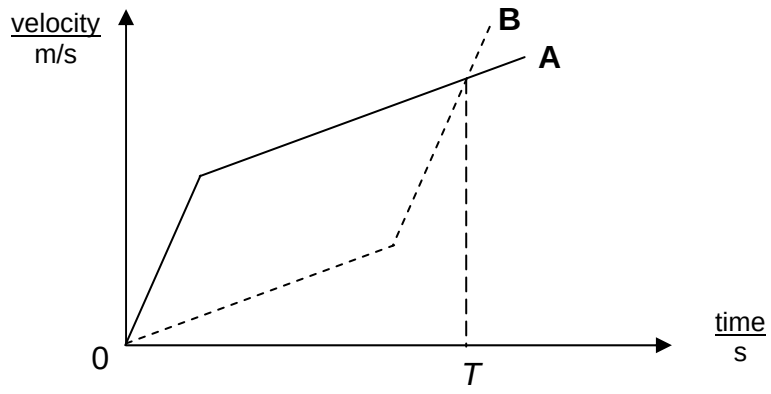
5 An equation to determine an unknown, X, gives the result:

$$X = \frac{10.0 \text{ cm}}{30 \text{ s}}$$

This value of X should best be expressed as

A 1/3 cm/s
B 0.3 cm/s
C 0.33 cm/s
D 0.333 cm/s

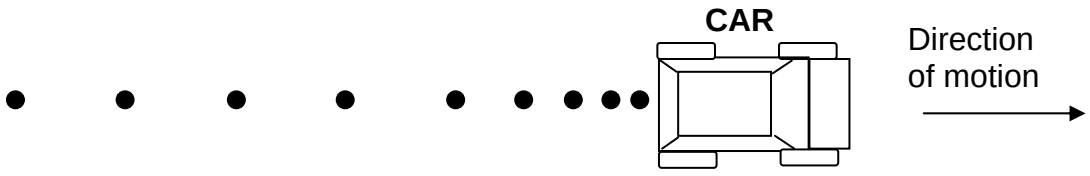
6 Two cars **A** and **B** start from rest simultaneously and travel along the same straight road. The velocity-time graphs of the two cars are shown below.



Which of the following statements about the motion of the two cars is always correct?

A **A** and **B** have the same average acceleration during the time interval 0 to *T*.
B **A** and **B** have the same average velocity during the time interval 0 to *T*.
C **A** and **B** have the same average speed during the time interval 0 to *T*.
D **A** and **B** travel the same displacement during the time interval 0 to *T*.

7 Oil drips at a constant rate from a moving car. The diagram shows the pattern of the drips on a road.



Which of the following statements describes the motion of the car?

A It accelerated and then moved at a steady speed.
B It accelerated and then slowed down.
C It moved at a steady speed and then slowed down.
D It moved at a steady speed and then accelerated.

8 In an experiment to determine the acceleration of a car, which of the following measurements is **not** required?

A The mass of the car.

B The initial velocity of the car.

C The final velocity of the car.

D The duration of the acceleration.

9 Objects released near the surface of the moon fall more slowly than on Earth because

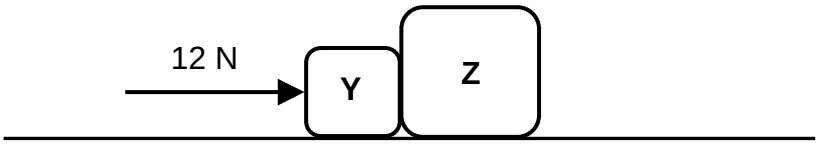
A they have greater mass on the Earth.

B they have greater inertia on the moon.

C the gravitational field strength of the Earth is greater.

D the normal reaction force on the moon is greater.

10 Two blocks, **Y** and **Z** of mass 1.0 kg and 3.0 kg respectively are placed on a horizontal smooth surface as shown below.



A horizontal constant force of 12 N is applied to Block **Y** so that the two blocks move to the right with a uniform acceleration of 3.0 m/s^2.

What is the magnitude of the contact force between **Y** and **Z**?

A 3.0 N **B** 4.0 N **C** 8.0 N **D** 9.0 N

11 Which of the following forces **cannot** be obtained from the addition of a 4.0 N force and a 9.0 N force?

A 6.5 N **B** 8.0 N **C** 11.0 N **D** 13.5 N

12 A girl is able to balance a Physics textbook on one of her fingertips.

Which of the following statements best explains this phenomenon?

A The centre of gravity of the book is right below the pivot.

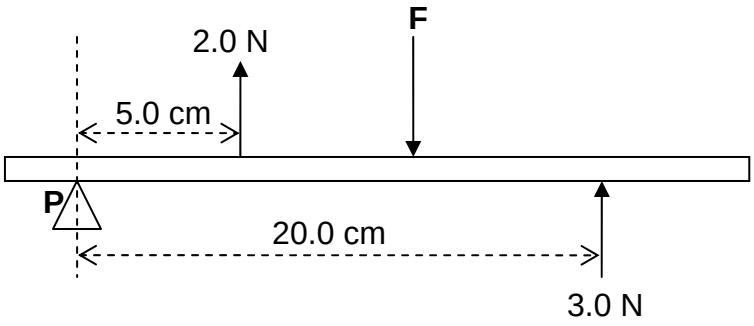
B The line of action of the weight passes through the pivot.

C The sum of clockwise moments equals the sum of anticlockwise moments about the pivot.

D There is no force acting on the book.

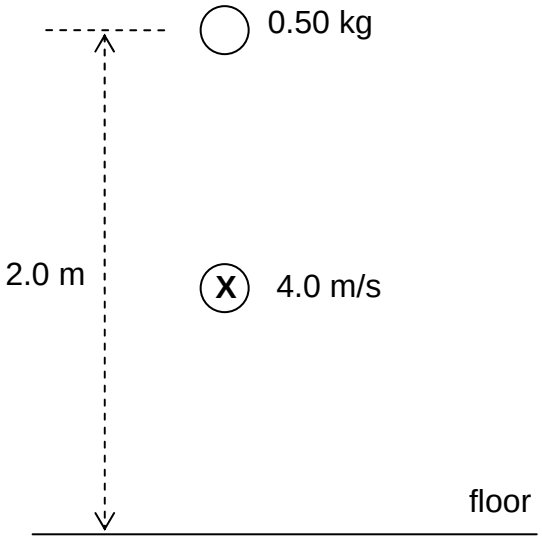
13 A rod is balanced by three forces, 2.0 N, 3.0 N and **F**. The pivot **P** is situated 5.0 cm from the 2.0 N force and 20.0 cm from the 3.0 N force.

What is the moment produced by **F** about the point **P**?



A 0 Ncm **B** 50 Ncm **C** 70 Ncm **D** 125 Ncm

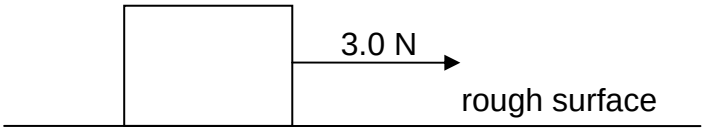
14 A girl releases a ball of mass 0.50 kg from a height of 2.0 m. When the ball reaches position **X**, it attains a speed of 4.0 m/s.



Determine the gravitational potential energy of the ball at position **X**. Take the floor as the reference for zero energy level.

A 6.0 J **B** 8.0 J **C** 10 J **D** 12 J

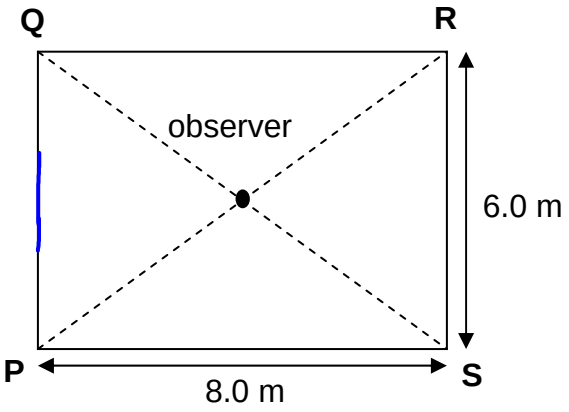
15 A block is being pulled by a horizontal force of 3.0 N on a rough surface. The block moves at a constant speed of 2.0 m/s for 5.0 s.



What is the power developed by the 3.0 N horizontal force?

A 1.2 W **B** 6.0 W **C** 7.5 W **D** 30 W

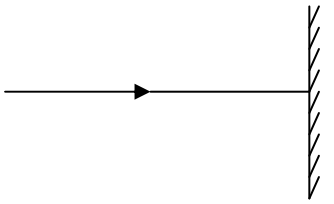
16 The diagram below shows the top view of a room **PQRS** which measures 6.0 m by 8.0 m. An observer stands at the centre of the room with his back to **RS**.



In order for the observer to see the full width of the wall **RS**, what is the minimum width required of a plane mirror placed at eye level on the wall **PQ**?

A 2.0 m **B** 3.0 m **C** 4.0 m **D** 5.0 m

17 A light ray is incident normally on a mirror as shown below.



The angle of reflection for the ray will be

A 180° **B** 90° **C** 45° **D** 0°

18 When light waves pass from air into glass, which of the following is **correct**?

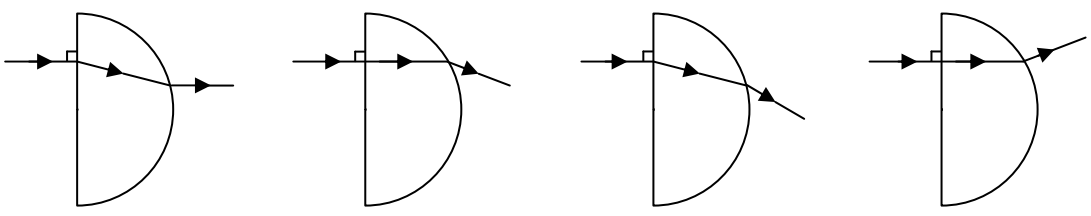
A The frequency of the light waves will remain the same.

B The amplitude of the light waves will increase.

C The wavelength of the light wave will increase.

D The shape of the light wave will change.

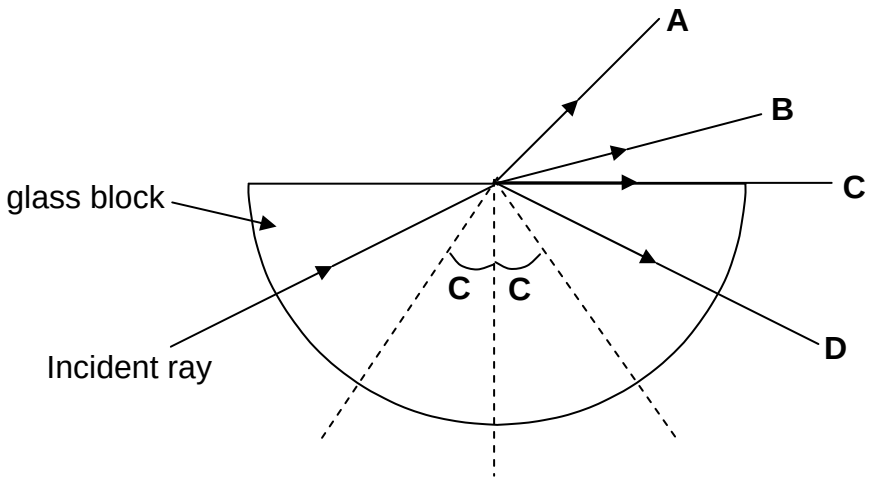
19 Which of the following diagrams correctly shows light travelling through a semi-circular glass block in air?



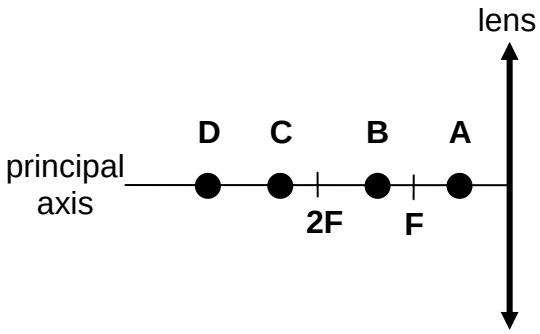
A **B** **C** **D**

20 The diagram shows a semi-circular glass block with an incident ray shining towards the centre of the flat face as shown. The critical angle of the glass block is labelled **C**.

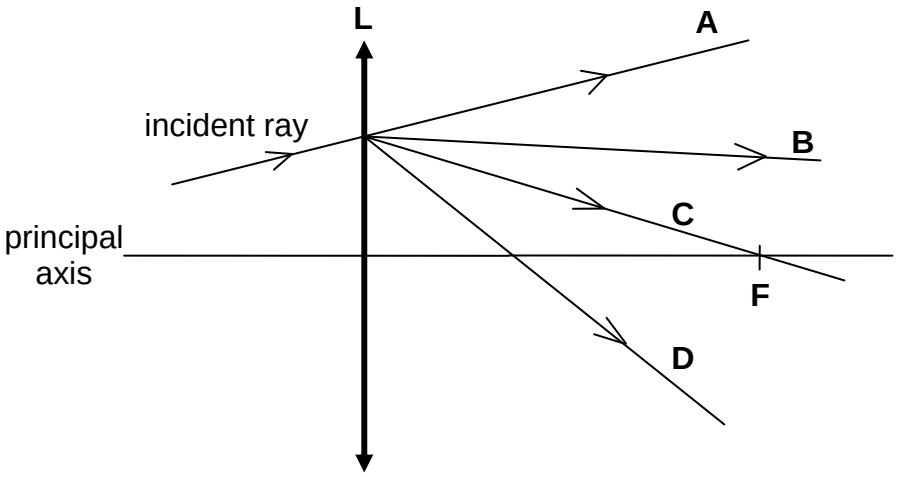
Which line correctly shows the subsequent path of the light ray?



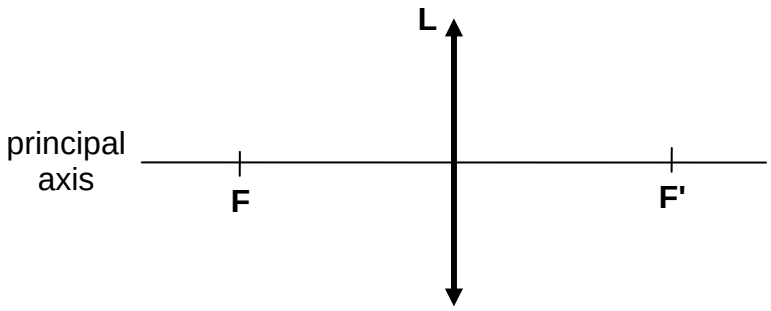
21 At which positions, **A**, **B**, **C** or **D**, should an object be placed in front of a lens, with its principal focus at **F**, such that its image produced will be suitable for use in an overhead projector?



22 **L** is a lens with a principal focus at **F**. Which of the following rays, **A**, **B**, **C** or **D**, is the most likely emergent ray after the incident ray passes through **L**?



23 A stamp collector uses a convex lens, **L**, to view a stamp. She places the stamp 10.0 cm in front of her lens and she sees a magnified, virtual image of the stamp.



The distance between the two principal foci **F** and **F'** is

A less than 10.0 cm.

B between 10.0 cm and 20.0 cm.

C exactly 20.0 cm.

D more than 20.0 cm.

24 Which of the following waves is **not** part of the electromagnetic spectrum?

A Ultrasonic waves **B** Radio waves

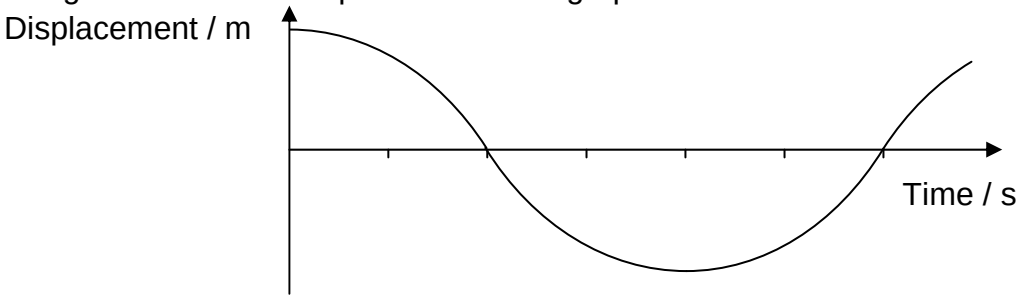
C Infra-red waves **D** Gamma rays

25 The speed of light in a vacuum is

A 3×10^5 km/h **B** 3×10^5 km/s

C 3×10^{11} km/h **D** 3×10^{11} km/s

26 The diagram shows the displacement-time graph for a water wave.



Which of the following **cannot** be determined from the graph?

A The amplitude of the wave.

B The period of the wave.

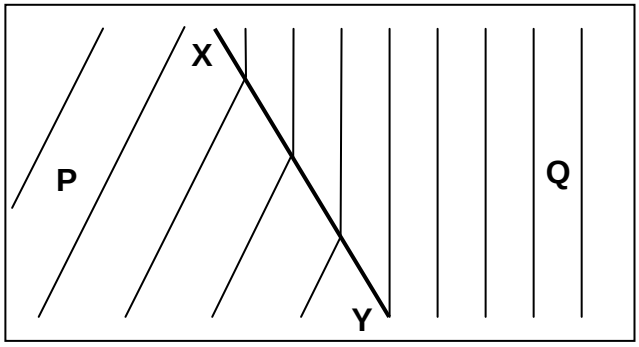
C Whether the wave is transverse or longitudinal.

D The frequency of the wave.

27 An oscillator with frequency 6.0 Hz is dipped into a ripple tank. The resulting waves have a wavelength of 2.0 cm.
What is the speed of the waves?

A 0.12 m/s **B** 0.20 m/s **C** 3.0 m/s **D** 12 m/s

28 The following diagram shows waves in a ripple tank in which the water on the left and right sides of **XY** are of different depths.



Which of the following statements is correct?

A The waves must be travelling from **P** to **Q**.

B The water is deeper in section **P**.

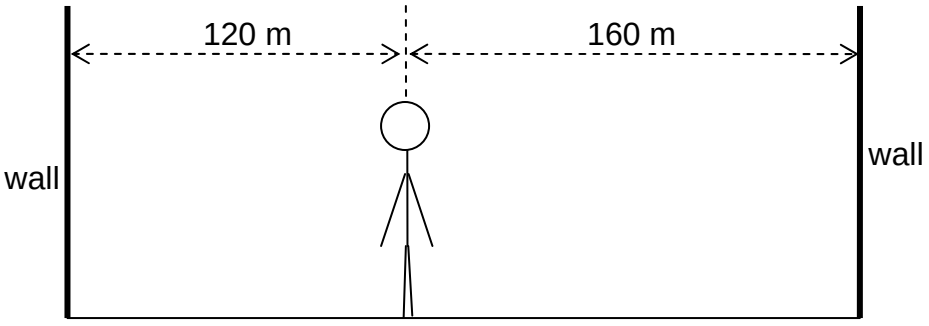
C The waves move faster in section **Q**.

D The frequency of the waves is greater in section **Q**.

29 Which of the following sounds **can** be heard by a normal human adult?

A 15 Hz **B** 150 Hz **C** 150 kHz **D** 15 MHz

30 A girl stands between two vertical walls as shown in the diagram and shouts once.



Assuming that the speed of sound in air is 320 m/s, how long will it take for her to hear the **second** echo?

A 0.5 s **B** 0.75 s **C** 1.0 s **D** 2.0 s

End of paper