

# MODEL ENTRANCE TEST PAPER

**BRITISH SECTION**

**SUBJECT: PHYSICS**

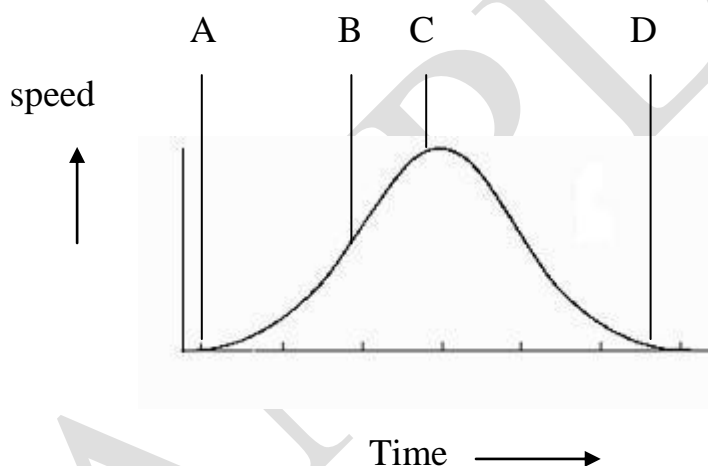
**Grade: 9**

**TOTAL MARKS: 25**

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## **I. Choose the best answer:**

1. The speed-time graph shown is for a bus traveling between stops. Where on the graph is the acceleration of the bus greatest?



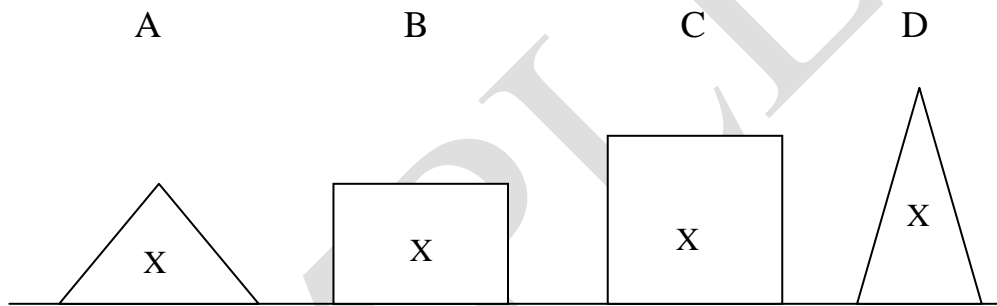
2. Two stones of different weight fall at the same time from a table. Air resistance may be ignored. What will happen and why?

	<b>what will happen</b>	<b>why</b>
A	both stones hit the floor at the same time	acceleration of free fall is constant
B	both stones hit the floor at the same time	they fall at constant speed
C	the heavier stone hits the floor first	acceleration increases with weight
D	the heavier stone hits the floor first	speed increases with weight

3. A liquid has a density of  $0.80\text{g/cm}^3$ . Which could be the volume and mass of this liquid?

	Volume/ $\text{cm}^3$	Mass/g
A	2.0	16
B	8.0	10
C	10	8
D	16	2.0

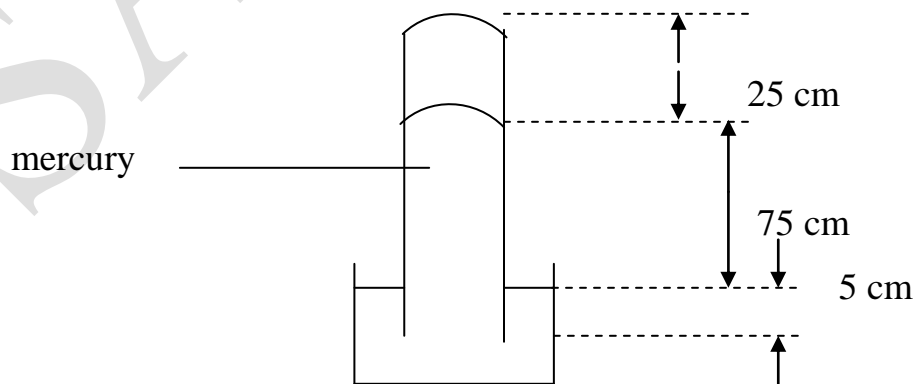
4. The diagram shows section of four objects of equal mass. The position of the centre of mass of each object has been marked with a cross. Which object is the most stable?



5. A power station uses nuclear fission to obtain energy. In this process, nuclear energy is first changed into

- A. chemical energy
- B. electrical energy
- C. gravitational energy
- D. thermal (heat) energy

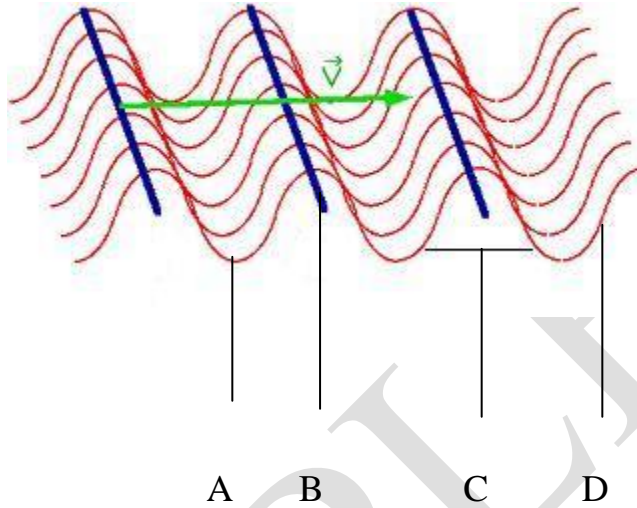
6. The diagram shows a mercury barometer.



Which distance is used to calculate the pressure of the atmosphere?

- A. 25cm      B. 75cm      C. 80cm      D. 100cm

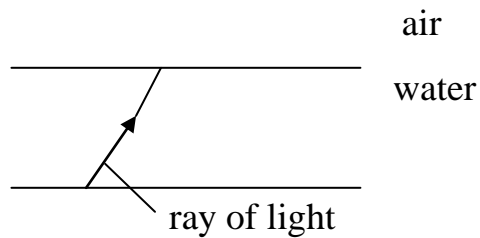
7. The diagram shows a water wave in a ripple tank. Which line represents a wave front?



8. Which statement about radio waves is correct?

- A. They travel as longitudinal waves  
B. They travel at the same speed as sound waves  
C. They travel by means of molecular vibration  
D. They can travel through a vacuum

9. A ray of light in water is incident on the surface. The angle of incidence is much smaller than the critical angle.



What happens to this ray?

- A. It is completely reflected
- B. It is completely refracted
- C. It is partially reflected and partially refracted
- D. It is refracted at an angle of refraction of  $90^\circ$

10. Sound waves may cause an echo what happens to sound waves to cause an echo and what is the nature of sound waves?

	<b>What an echo is caused by</b>	<b>Nature of sound waves</b>
A	reflection	longitudinal
B	reflection	transverse
C	refraction	longitudinal
D	refraction	transverse

**II. 1.** Observations of a distant thunderstorm are made.

(a) During a lightning flash, the average wavelength of the light emitted is  $5 \times 10^{-7}$  m. This light travels at  $3 \times 10^8$  m/s. Calculate the average frequency of this light.

**[2 Marks]**

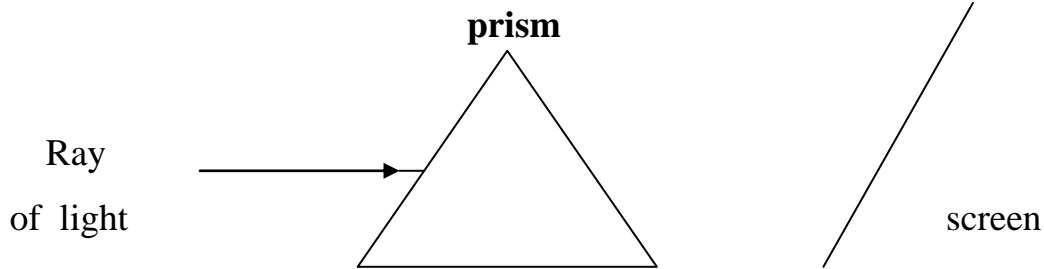
(b) The interval between the lightning flash being seen and the thunder being heard is 3.6sec. The speed of sound in air is 340 m/s.

(i) Calculate the distance between the thunderstorm and the observer. **[2 Marks]**

(ii) Explain why the speed of light is not taken into account in this calculation.

**[1 Mark]**

(c) A single ray of white light from the lightning is incident on a prism as shown in the figure. Complete the path of the ray to show how a spectrum is formed on the screen. Label the colors. **[3 Marks]**



2. A body is in equilibrium and is acted upon by two vertical downward forces in such a way that there is no net moment about a pivot. A student is asked to show this experimentally. The student is provided with a suitable pivot, a metre rule with a hole drilled in the centre, two sets of masses and strong cotton.

(a) In the space below, draw a labeled diagram of the apparatus set up ready for use.

**[2 Marks]**

(b) Describe how two sets of readings are taken, explaining how equilibrium is achieved in each case.

**[2 Marks]**

(c) Write down, in table form, two possible sets of values and use them to show that there is no net moment.

**[3 Marks]**

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