

# MODEL ENTRANCE TEST PAPER

**BRITISH SECTION**

**SUBJECT: PHYSICS**

**Grade: 9**

**TOTAL MARKS: 25**

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

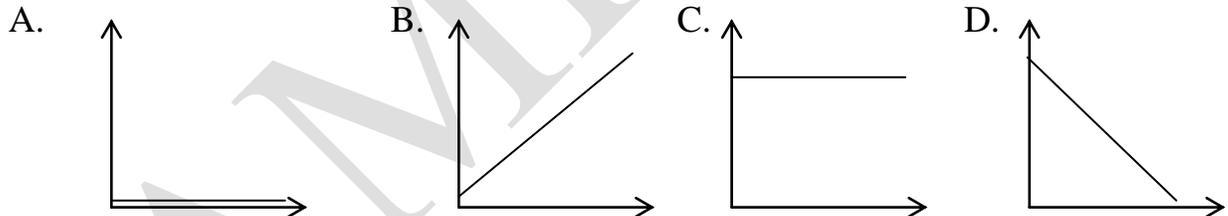
1. Which quantity is measured in newtons?

- A. density      B. energy      C. pressure      D. weight

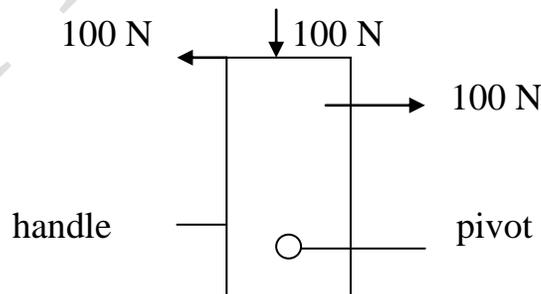
2. In a race, a car travels 60 times around a track of 3.6km. This takes 2.4 hours.  
What is the average of the car?

- A. 1.5km/h      B. 90km/h      C. 144km/h      D. 216 km/h

3. A car is moving downhill along a road at a constant speed. Which graph is the speed/time graph for the graph?



4. The diagram shows a handle with three forces, each 100N, applied to it. The handle is free to move.



What is the effect of the forces on the handle?

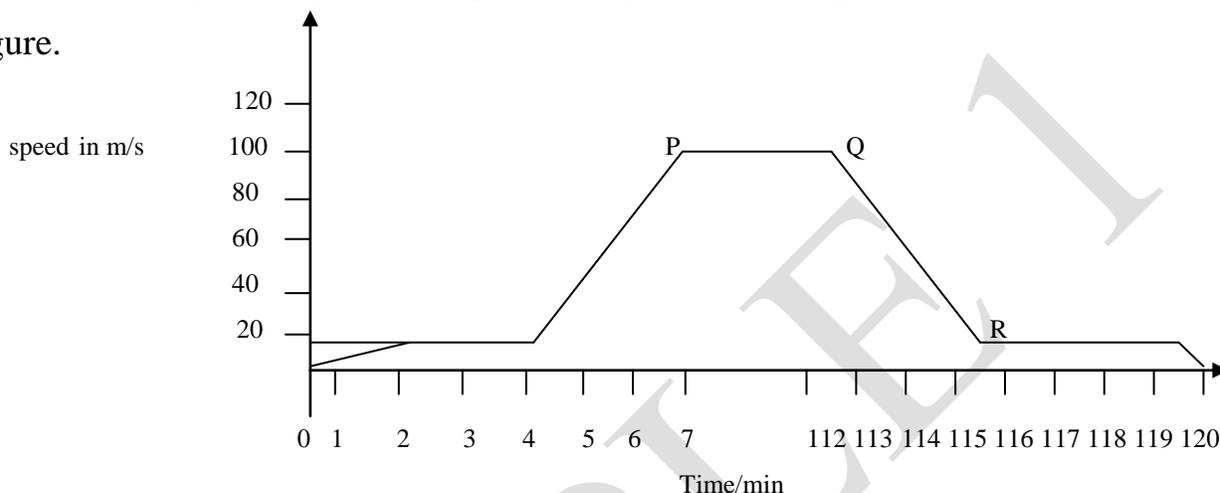
- A. The handle will move downwards
  - B. The handle will not move
  - C. The handle will turn anticlockwise (to the left)
  - D. The handle will turn clockwise (to the right)
5. A stone has a volume of  $0.50\text{cm}^3$  and a mass of  $2.0\text{g}$ . What is the density of the stone?
- A.  $0.25\text{g/cm}^3$                       B.  $1.5\text{g/cm}^3$                       C.  $2.5\text{g/cm}^3$                       D.  $4.0\text{g/cm}^3$
6. Why does convection take place in a liquid when it is heated?
- A. Liquids expand when they are heated
  - B. Liquids start to bubble when they get close to boiling point.
  - C. Molecules in the liquid expand when they are heated.
  - D. Molecules near to the surface of the liquid escape into the air.
7. In which pair of energy sources are both sources renewable?
- A. oil and coal
  - B. oil and tidal
  - C. tidal and geothermal
  - D. tidal and nuclear fission
8. Which statement is explained by reference to pressure?
- A. Objects with greater mass have greater weight
  - B. One kilogram of water occupies more volume than one kilogram of lead
  - C. Spikes on running-shoes sink into the ground
  - D. Water could to a low enough temperature turns to ice.
9. Which row correctly describes light waves and radio waves?

	<b>light waves</b>	<b>radio waves</b>
A	longitudinal	longitudinal
B	longitudinal	transverse
C	transverse	longitudinal
D	transverse	transverse

10. What is the unit of wavelength?

- A. hertz                      B. metre                      C. metre per second                      D. second

II. 1. A high-speed train has a mass of  $4 \times 10^5$  kg and runs at a maximum speed of 100 m/s. A simplified speed-time graph of a journey lasting two hours is shown in figure.



(a) Although the speed of the train is constant between points P and Q on the graph, its velocity may vary. Explain how that is possible. **[2 Marks]**

(b) It is not possible to calculate the acceleration of the train from the speed time graph. Suggest a reason for this. **[2 Marks]**

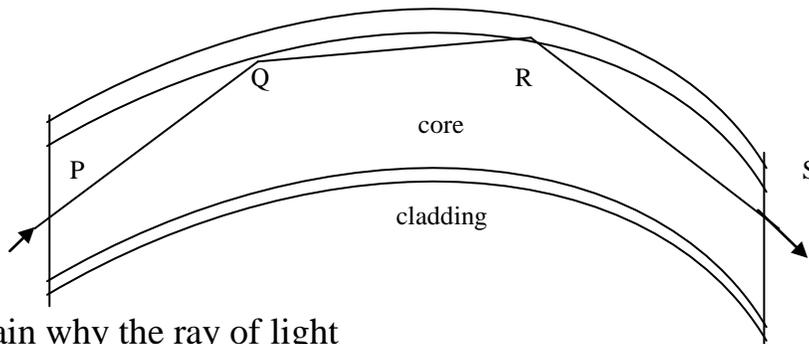
(c) (i) Use the graph to determine the rate at which the speed of the train decreases during the part of journey marked QR. **[2 Marks]**

(ii) If this part of the journey is over a horizontal straight track, calculate

(1) The force required to slow down the train at this rate. **[2 Marks]**

(2) How far the train travels while it is slowing down. **[2 Marks]**

2. Figure shows a length of optical fibre with a ray of light passing through.



(a) Explain why the ray of light

(i) Does not change direction at P or at S.

**[1 Mark]**

(ii) Is totally reflected at Q and at R.

**[2 Marks]**

(b) The refractive index of the glass of the cladding is less than that of the core. Suggest why a fibre with cladding is better than a fibre without cladding.

**[2 Marks]**