

## GENERAL QUESTIONS FOR PRACTICE

1. Suggest one reason why on hot day, heat losses in mains electricity transmission lines may generally be greater than on a cold day.  
(1mk)
2. Why is a gap left between one end of a metal bridge and the end of a road leading to the bridge  
(1mk)
3. Why does a person wearing damp clothes feel cold on a strong wind  
(2mks)
4. A bullet of mass 0.8g traveling at 400m/s is stopped by a concrete wall. Calculate the amount of heat energy transferred to the wall.  
(2mks)

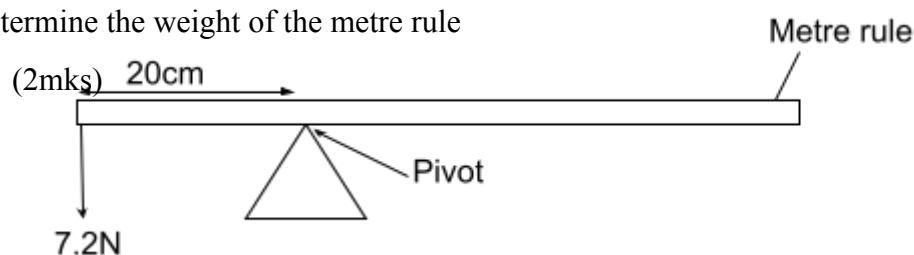
5. The figure below shows a uniform metre rule on equilibrium.

(i) What is the significance of the word uniform metre rule

(1mk)

(ii) Determine the weight of the metre rule

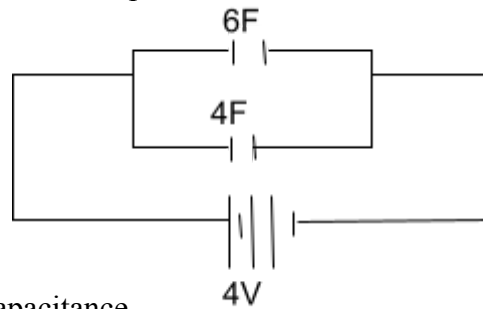
(2mks)



6. An object is projected vertically upwards at a speed of  $15\text{ms}^{-1}$ . How long will it take to return to the same level of projection?  
(3mks)
7. A boy pulls the handle of a lawn mower at an angle of  $30^\circ$  to the horizontal with a force of 120N. Calculate the work done when the mower moves through a distance of 12.8m. (3mks)

8. State Hooke's law  
(1mk)
9. A force of 20N causes a wire to stretch by 40mm. calculate the energy stored on the  
100mm wire when stretched 50mm  
(3mks)
10. State **two** ways of increasing the strength of an electromagnet  
(2mks)

11. The diagram shows capacitors in parallel connected to 4V battery



- (i) Calculate the total capacitance  
(2mks)
- (ii) What is the energy stored on the capacitors  
(3mks)
12. Show that a body falling from a height  $h$  hits the ground with energy  $E = \frac{1}{2}mv^2$   
(3mks)
13. (a) State Hooke's law  
(1mk)
- (b) A force of 50N stretches a spring by 60mm. what force will extend by 20mm  
(3mks)
- (c) Calculate the work required to stretch the spring by 40mm  
(3mks)
- (d) If the diameter of the spring is 14mm, calculate the stress provided when the force of 100N is applied.  
(3mks)
14. A bullet is fired horizontally from a cliff at a velocity  $100\text{ms}^{-1}$ . It takes 10 seconds to

hit the ground.

(i) Sketch the graph of height against time for the motion

(2mks)

(ii) Calculate the height of the cliff

(2mks)

(iii) What is the horizontal distance moved from the cliff when the bullet hits the ground (3mks)

(iv) Determine the velocity and direction with which the bullet hits the ground

(3mks)

15. A crane lifts a load of 2000kg through a vertical distance of 3.0m in 6 seconds.

(a) Determine the ;

(i) Work done

(2mks)

(ii) Power developed by the crane

(2mks)

(iii) Efficiency of the crane given that it is operated by an electric motor rated 12.5Kw

(b) In an experiment to determine the specific latent heat of vaporization of matter, steam

at 100°C was passed into water contained in a well lagged copper calorimeter. The

following results were made:

Mass of calorimeter = 50g

Initial mass of water = 70g

Initial temperature of water = 5°C

Final mass of calorimeter + condensed steam = 123g

Final temperature of mixture = 30°

*Specific heat capacity of water =  $5200 \text{ JKg}^{-1} \text{ K}^{-1}$  and specific heat capacity for copper =  $390 \text{ JKg}^{-1} \text{ K}^{-1}$*

Determine the; (a) Mass of condensed steam

(1mk)

(b) Heat gained by the calorimeter

(4mks)

(c) Specific latent heat of vaporization of steam

(3mks)

16. Distinguish between soft and hard magnetic materials

(2mks)

17. (a) Define the following terms ; (i) Mechanical advantage

(ii) Velocity ration

(iii) Efficiency

(b) Draw a diagram of a pulley system having ;

(i) Velocity ratio of 5

(3mks)

(ii) The pulley system above is used to raise a lead of 100N through a distance of 5cm.

The system is 80% efficient.

Calculate; (i) The effort

(4mks)

(ii) The work done

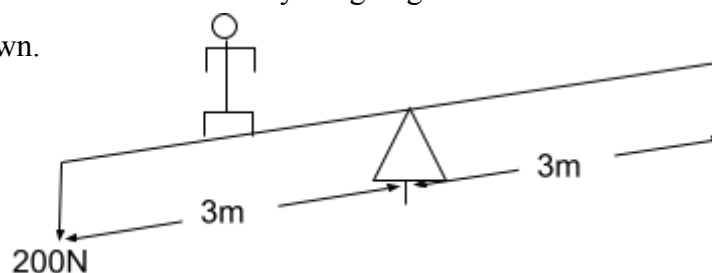
(3mks)

18. (a) State the principle of moments

(1mk)

(b) A uniform plank of length 6m is pivoted at the centre to make a see saw. A weight of

200N acts at one end. A body weighing 500N moves towards the pivot on the plank as shown.



How far will the boy have to move from the pivot, for the see-saw to balance?

(3mks)

19. A string vest keeps a person warm though it is a collection of holes bounded by strings.

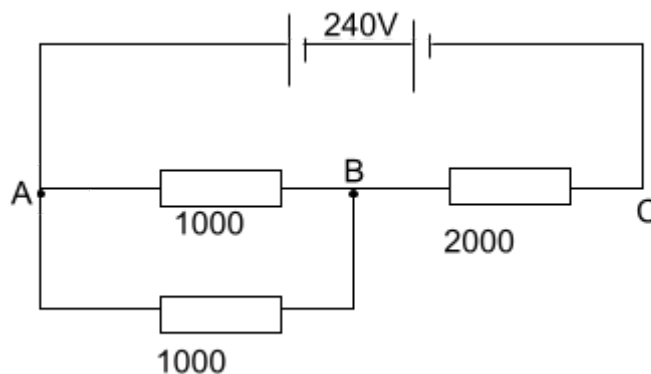
Explain

(2mks)

20. Which property of waves explains why sounds are easier to hear at night

(1mk)

21. Three resistors are connected as shown at the figure below.



Determine the potential difference between A and B

(3mks)

22. A wise cyclist will carry a load on the bicycle's carrier and not in a rack sack on his

back. Explain

(2mks)

23. Give a reason why tungsten is performed as target material in the X-ray tube.

(1mk)

24. An object weighs 0.56N in air and 0.42N when wholly immersed in water.

Calculate

the density of the object. (Density of water =  $1 \times 10^3 \text{ kg m}^{-3}$ )

(3mks)

25. The conductivity of a metallic conductor decreases with increase in temperature whereas

the conductivity of a semi-conductor increases with increase in temperature.

Explain (2mks)

26. Light of frequency  $6.0 \times 10^{14} \text{ Hz}$  strikes a sodium surface of work function  $3.68 \times 10^{-19} \text{ J}$ .

Calculate the maximum energy with which electrons are emitted.

(Planks constant =  $6.6 \times 10^{-34} \text{ J}$ )

(3mks)

27. Use the kinetic theory to explain the behavior of illuminated smoke floating in air (2mks)

29. Find the quantity of heat required to change ice at  $-10^\circ \text{C}$  to water at  $0^\circ \text{C}$  (3mks)

30. The pattern below shows oil leakage on a path at the rate of 10 drops per second from a lorry.



(a) Calculate the initial and final velocity

(3mks)

(b) Calculate the acceleration of the lorry

(2mks)