Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic: Waves (High Demand Questions)

Merit Minds
www.merit-minds.com
Exam Preparation and Free Resources

Name of the Student:____
Max. Marks : 26 Marks **Time : 26 Minutes**

Mark Schemes

Q1.

(a) the kinetic energy (and the potential energy) of the particles increases

allow the speed of the particles increases

1

so the internal energy increases because it is the sum of kinetic and potential energy (of the particles)

1

(b) latent heat (of vaporisation)

allow specific latent heat (of vaporisation)

1

(c) stays the same

1

(d) more collisions per second

1

a greater force per collision

1

(e) $0.875 = \frac{\text{useful output energy transfer}}{1\ 560\ 000}$

allow a correct substitution using incorrectly/not converted values of efficiency and/or energy

1

useful output energy transfer = 1 365 000(J)

this answer only

the equation

efficiency = $\frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$

must have been used to score subsequent marks

1

1 365 000 = 125 × c × (22.1–11.6)

allow a correct substitution using their calculated value of useful output energy

1

$c = \frac{1\ 365\ 000}{125 \times 10.5}$

allow a correct re-arrangement using their value of useful output energy

1

c = 1040 (J/kg °C)

allow a correct calculation using with their value of useful output energy

1

c = 1.04 × 10^3 (J/kg °C)

this mark can only be awarded for a calculation using the correct equations

1

(f) the advertisement has ignored the energy input from the surrounding air

1

so the total energy input is greater than the energy supplied from the electricity

an answer that the total energy input comes from the electricity supply and the air outside the building gains the first two marking points

1

the efficiency must be less than 100%

1

[15]

Q2.

(a) **Level 2:** The design/plan would lead to the production of a valid outcome. All key steps are identified and logically sequenced.

3–4

Level 1: The design/plan would not necessarily lead to a valid outcome. Most steps are identified, but the plan is not fully logically sequenced.

1–2

No relevant content

0

Indicative content

Wavelength

- place a metre rule at the side of the screen perpendicular to the wave fronts
- use the metre rule to measure the length of the screen
- take a photograph of the shadow on the screen
- count the number of complete waves on the screen
- determine the wavelength by dividing the length of the by the number of complete waves

or

- place a metre rule at the side of the screen perpendicular to the wave fronts
- take a photograph of the shadow on the screen
- use the metre rule to measure the distance between two wave front

Frequency

- count the number of waves that pass a given point
- time how long it takes for the waves to pass that point using a stop clock
- frequency is number of waves divided by time taken

or

- put a stop clock on the screen
- use a digital video camera to record the waves passing a point
- replay in slow motion and count the number of waves passing a point in 1 second

There must be a description of both frequency and wavelength measurement to access level 2

(b) mean f = 9.5 Hz

1

mean λ = 0.020 m

1

v = 9.5 × 0.020

allow a correct substitution of an incorrect value of mean frequency and/or wavelength

1

v = 0.19 (m/s)

allow a correct calculation using an incorrect value of mean frequency and/or wavelength

1

or

v = 9.8 × 0.017
and
v = 9.4 × 0.022
and

v = 9.3 × 0.021 (2)

$$v = \frac{(1.67 + 2.07 + 1.95)}{3} \text{ (1)}$$

v = 0.19 (m/s) (1)

*allow a maximum of **2** marks if a single pair of values is used*

(c) reduces the effect of random errors

allow anomalous readings can be discarded before calculating a mean

1

(d) deeper water means longer wavelength

1

because

v increases and f is constant

allow for a fixed frequency period is constant

1

[11]