**232/1**

**PHYSICS**

**PAPER 1**

**(THEORY)**

**FORM FOUR**

**END TERM 1 2023 EXAMS**

**MARKING SCHEME**

1. 16.21mm✓1 correct answer with correct units

Accept 1.621cm or 0.01621m

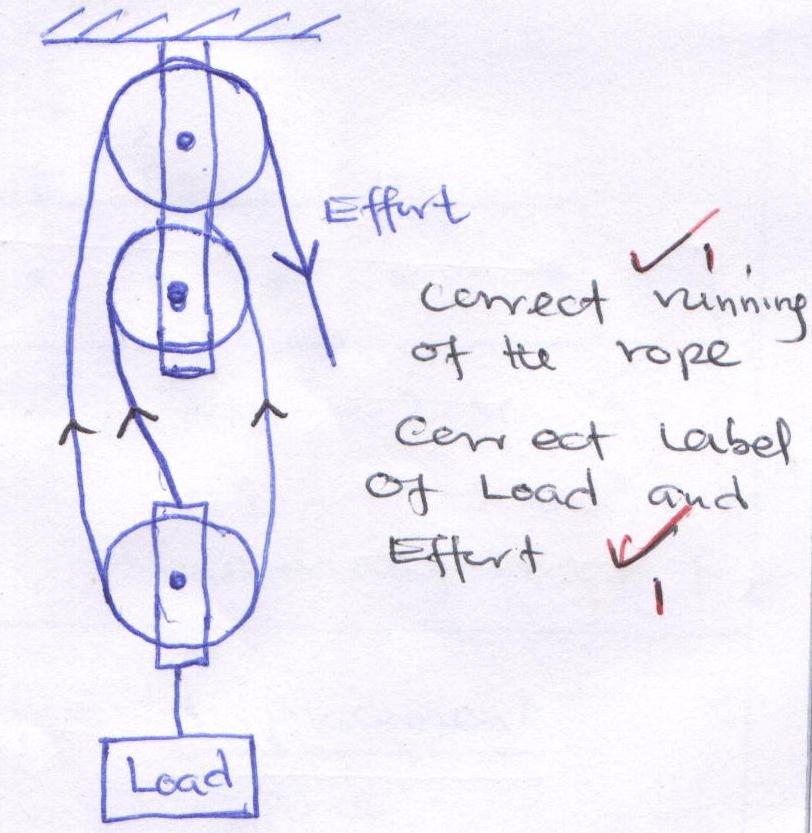
1. Momentum is conserved momentum before = momentum after

72 9 = 216 4✓1

⇒ u = ✓1

= 3.0m/s✓1

1. Roofing materials allows radiations to penetrate into the greenhouse✓1 but not out. Higher concentration of carbon dioxide inside the greenhouse helps to retain higher temperature by trapping/ insulating✓1 the heat.



1. V.R = 3✓1
2. Increase in temperature increases✓1 the speed of sound.
3. i) Convection takes place in air upwards direct due to✓1 to density defect.

ii) Convection requires a ✓1 material medium but the space between the sun and the earth i.e. space of the atmosphere has no material medium

1. From the equation of continuity

A1U1 = A2U2✓1(flow rate is constant)

120 0.4 = 4 U2

U2 = ✓1

= 12 ms-1✓1

1. Work done on the mass

= force distance

= 25 10 120

= 5000J.✓1

Work done = power time

= 200 30✓1

= 6000J✓1

But = 100

= 100

= 83.3% ✓1

1. ΔH = MCΔ

= +

390

= 34650.000 + 429000

= 463650✓1

Energy dissipation E = pt

3000

⇒t = = 154.55 sec✓1

1. At balance

Sum of clockwise = sum of anti-clockwise moments

40 = 30 X + (10)✓1

1.840 = 30X +18

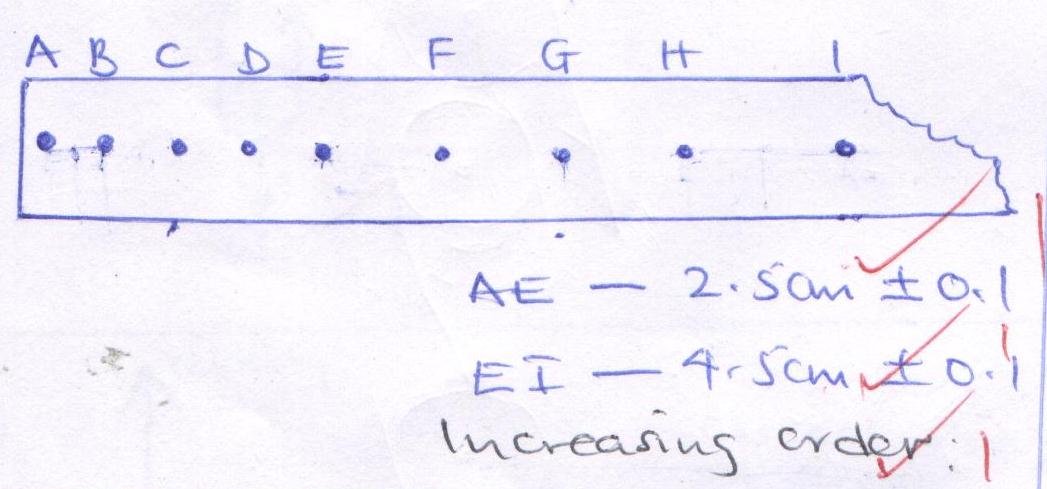
X = ✓1

= 1.8N✓1

1. To increase surface area of contact thus reducing pressure exerted on the road✓1

**SECTION B**

1. a)



b) i) Velocity =

=✓1

= 31.25cms-1✓1 **OR**0.3125ms-1

ii) E to I

Velocity = ✓1

= 56.25 cms-1✓1

c) a =

=

= = 1.5625ms-2

d) End A✓1

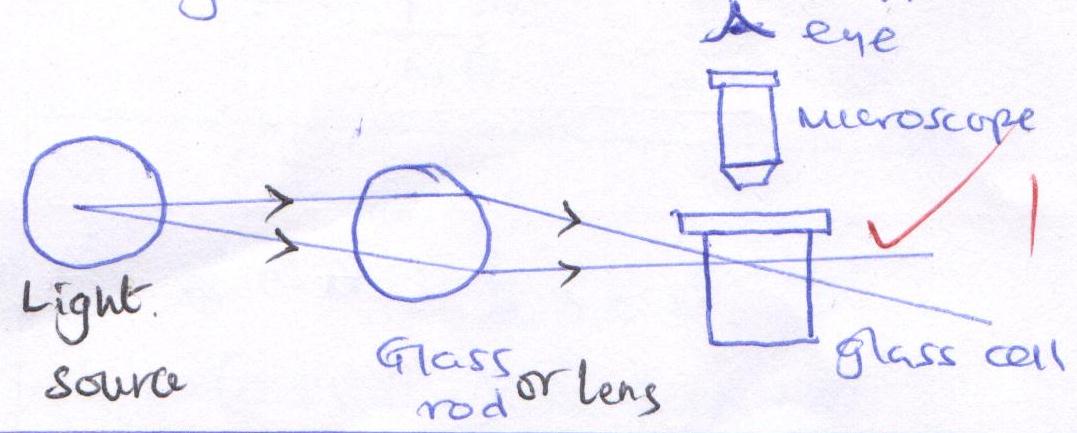
e) i) Trolley runs on a straight path on the runway✓1

ii) Tape lies flat on the horizontal surface. ✓1

1. i) Brownian motion is the continuous erratic/ random motion in either gas or liquid molecules✓1

ii) - A small glass with air and carbon (smoke) particles✓1

* the glass cell is strongly illuminated by a filament lamp directed by a perspex rod✓1
* the particles scatter light and they can be viewed through a microscope✓1
* they appear as bright specks (spots) moving with the same irregular random motion



b) i) V= r2h

0.01 = 3.14 r2h✓1

h = ✓1

= = 2m ✓1

ii) i) Oil spreads to form a monolayer✓1

ii) Oil patch formed is exactly circular. There is no evaporation of oil molecules movement/ spreading ✓1 of the oil molecules are elastic.

1. a) i) In elastic collision – K.E and momentum of the objects are conserved✓1

Elastic collision – only momentum is conserved✓1

ii) Initial momentum = Final momentum

2MBUB + MAUA = 3MV✓1

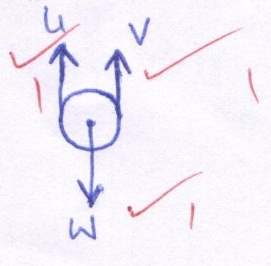
0 + MUA = 3Mu✓1

3Mu = MU

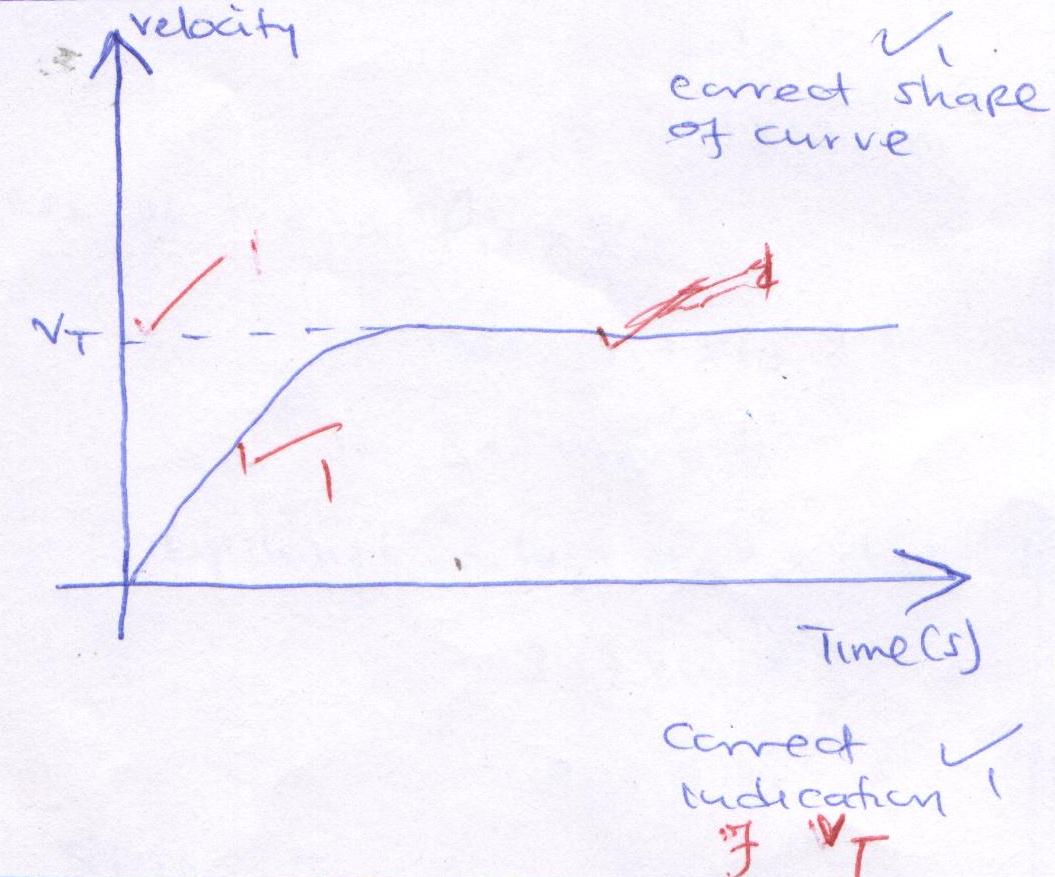
u -

= ms-1✓1

b) i)



ii)



1. a) i) = 2f

= 210

= 20rad s-1

= 62.83 rad-1

TA = M2r – mg

= ✓1

= 19 + 3.9 – 10

= 1963.9N✓1

ii) At the lowest point

Fc = T – Mg

⇒ Fe + Mg

= mr2 + mg

= 10.5+ ✓1

= 1973.9 + 10

= 1983.9N✓1

b) i) - Electric heater is switched ✓1 on.

- Time is obtained for a certain temperature rise✓1

- Mass of block is obtained✓1

pt = MCθ

c = ✓1

ii) pt = MCΔ

⇒C=

= ✓1

= ✓1

= 4050JKg-1k-1

1. a) i) ∑C.m = ∑ A.C.M

40(0.25 - u) = 30 20✓1

10 – 40u = 600

40u - -590

U = ✓1

= - 14.75N✓1

u = 14.75 (acting upwards)

ii) U = wgt of liquid displaced

14.75 = mg

= v g

Vol of liquid displaced = vol of block

=

= = 0.00125✓1

14.75 = 0.00125

⇒ = ✓1

= 1180kgm-3✓1

b) i) A floating object displaces its own weight of the fluid on which it floats✓1

ii) Tension + Upthrust = weight

Upthrust = wgt of H2O displaced

Vol. of H2O displaced = vol of aluminium

= =

= 3.7 m3✓1

Mass of H2O =

= 1000

= 3.7

upthrust = wgt of H2O displaced

= 3.7

= 3.7N✓1

Since T + U = W

T = W – U

= Mg – U

T = (10 ) – 3.7

= 6.3N✓1