# FORM FOUR EVALUATION TEST

## END OF 2ND TERM – 2018

# MARKING SCHEME

## PHYSICS PRACTICALS F.4 232/ $PP_1$ EXAM

## July/August

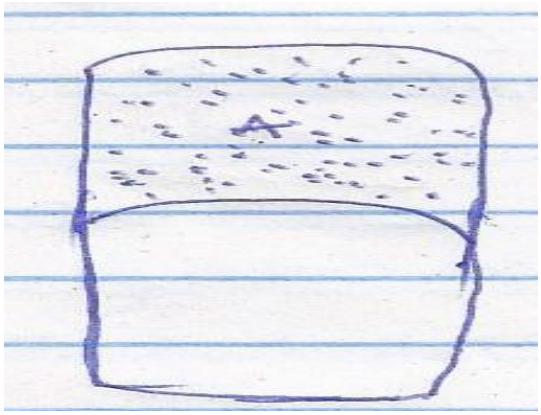
1. Main scale = 0.8cm
   Vender scale = 4 x 0.01 ✓

   0.8 + 0.4 = 0.84 – 0.02

   = 0.82cm✓

2. Construct volume movement of particles in a matter. ✓

3. i)




   ii) Soap film broken at 3 unbalanced surface tension force acting at A pull's the string upward. ✓

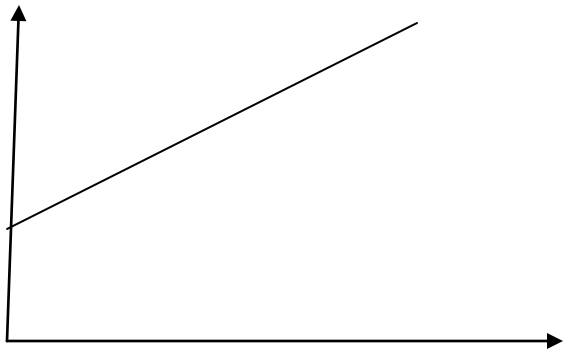
4. Volume flux = A V ✓

   = $\frac{6.284 \times 6}{10000}$✓

   $\frac{37.704}{1000}$ $m^3/s$

   3.7 x 10-3$M^3/s$✓

5. Brass expands more than invar✓when temperature rises above room temperature; the bimetallic uncoils making the pointer to move along the scale. ✓

6. 

7. F = ma

$a = \frac{10}{1} = 10m/s^2$ or 10N/kg✓

8. - Constriction ✓

   - Thin capillary bone ✓

9. Woolen clothing's traps air which prevent heat loss to the environment. ✓

10. Heat lost = heat gained✓

    5 x 200 x (60 – 60) = M x 4200 ( 60 – 30) ✓

    5 x 20 = 30M

    $\frac{100}{30} = 3.3kg$✓

11. $F_1d_1 = F_2\ d_2$ ✓

    1.5 x d = 0.5 ( 1 – d) ✓

    D = 0.25M✓

12. This temperature – $273^0C$ at which the volume of a get is assumed to be zero/lowest temperature a gas can fall to.

13. - Increasing the base area ✓ only one
    - lowering the height of the C.O.G✓

14. a) Action and reaction are equal and opposite. ✓

b) An elastic collision, both kinetic energy and momentum are conserved ✓
An inelastic collsion only momentum is conserved. ✓

c) i) $m_1n_1 + m_2 = (m_1 + m_2)$ ✓

$2000 \times 36 = (2000 + 1000)\ v$ ✓

$V = \frac{72\ 000}{3000} = 24\text{km/hr or } 6.667\text{m/s}$

ii) $d = vt$ ✓

$= 24000 \times 20$
$36000$

$= 133.3\text{M}$ ✓

iii) $1 = Ft$ = change in momentum

$2000\ (10 - 6.667) = 6{,}666\text{N/s}$ ✓

$\text{Force} = \frac{\text{impulse}}{\text{Time}} = \frac{6.666}{2} = 3,\ 333\text{N}$ ✓

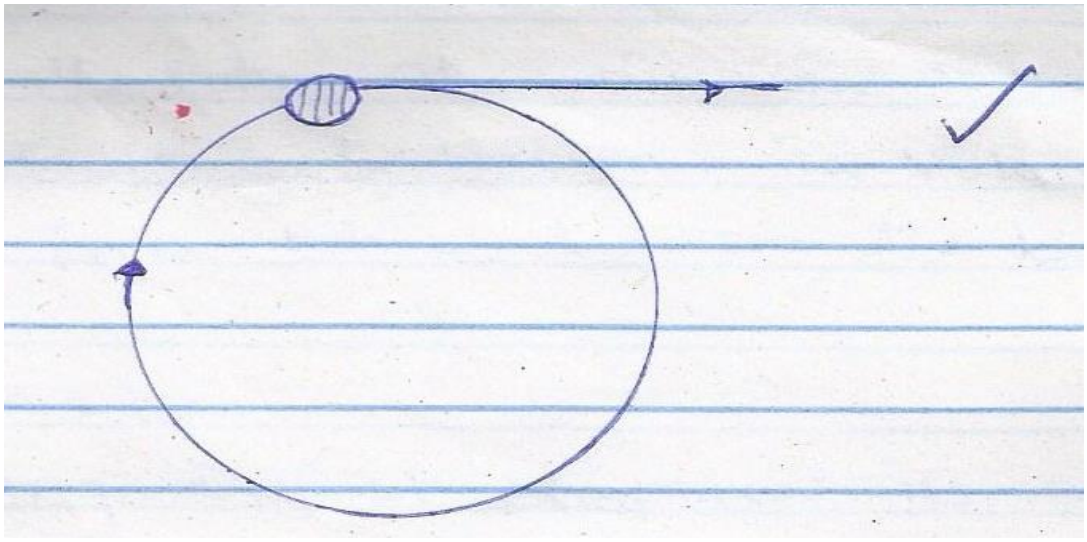
iv) K.E before collision = ½ x 2000 x 102 = 100 000 joules

K.E after collision = ½ x 3000 x 6.6672 = 66, 673 joules

Change = 100 000 – 66, 673

= 33, 327 joules ✓

15. a) i) ✓



ii) The body is said to be accelerating due to every time instantaneous change in velocities. ✓

b) $MV2 = Mg$
$r$

$V = vg$✓

$= 1.5 \times 10$ ✓

$= 15$

$= 3.673 m/s$✓

ii) $W = V$✓
$r$

$= 4m/s$
$1.5$

$= 2.667$ Red/s✓

iii) $Fc = \frac{MV^2}{r} - Mg$✓ ✓

$\frac{0.2 \times 4^2}{1.5} - 0.2 \times 10$

= 0.1333N✓

16. a) Outside the room the air in the balloon expands resulting to increase in volume. Thus higher upthrust force which lowers the balloon apparent weight. ✓

b) i) A floating object displaces its own weight of the

i) Fluid in which it floats✓

ii) Volume of object under water.

ii) Volume of water displaced = volume of the object.

¾ x 10 000cm3

= 30 0000cm3

= $3.0 \times 10^{-2} M^3$ or $0.03 M^3$

iii) Weight of water displaced

u = veg ✓

= 0.03 x 1.25 x 1000 x 10

= 375N✓

iii) Tension in the cable

u = Mg + T

u – Mg = T✓

$Mg = \frac{10}{1000} \times 10$

= 0.1N✓

T = 375 – 0.1

= 374 .9N✓

16. a) Density of the object

$P = \frac{m}{V}$

$\frac{10g}{4000}$ ✓

¼ x 10-3

= 2.5 x 10-4g/$cm^3$ or

= 0.25kg/$M^3$ or 2.5 x 10-1kg/$M^3$ ✓

17. a) VR = $\frac{\text{speed of effort}}{\text{Speed of load}} = \frac{8}{4} = 2$ ✓

b) i) Effort arm x effort = load arm x load

$\frac{40 \times 80}{100} = \frac{4}{100} \times L$ ✓

L = 800N ✓

ii) $P = F = \frac{800}{A} = \frac{800}{0.005} = 160{,}000$ N/M

iii) $\frac{F1}{A1} = \frac{F2}{A2}$

$F2 = \frac{800 \times 0.1}{0.005}$ ✓

= 16,00N ✓

Net weight ( of soil) = 16,000 – (1000 x 10)

= 6,000N ✓

iv) The force applied on piston A may be used to compress the air bubble hence the lift may not carry the soil up effectively to the required level.

c) $\frac{P1}{T1} = \frac{P}{T2}$

T1 = 12 + 273 = 285k

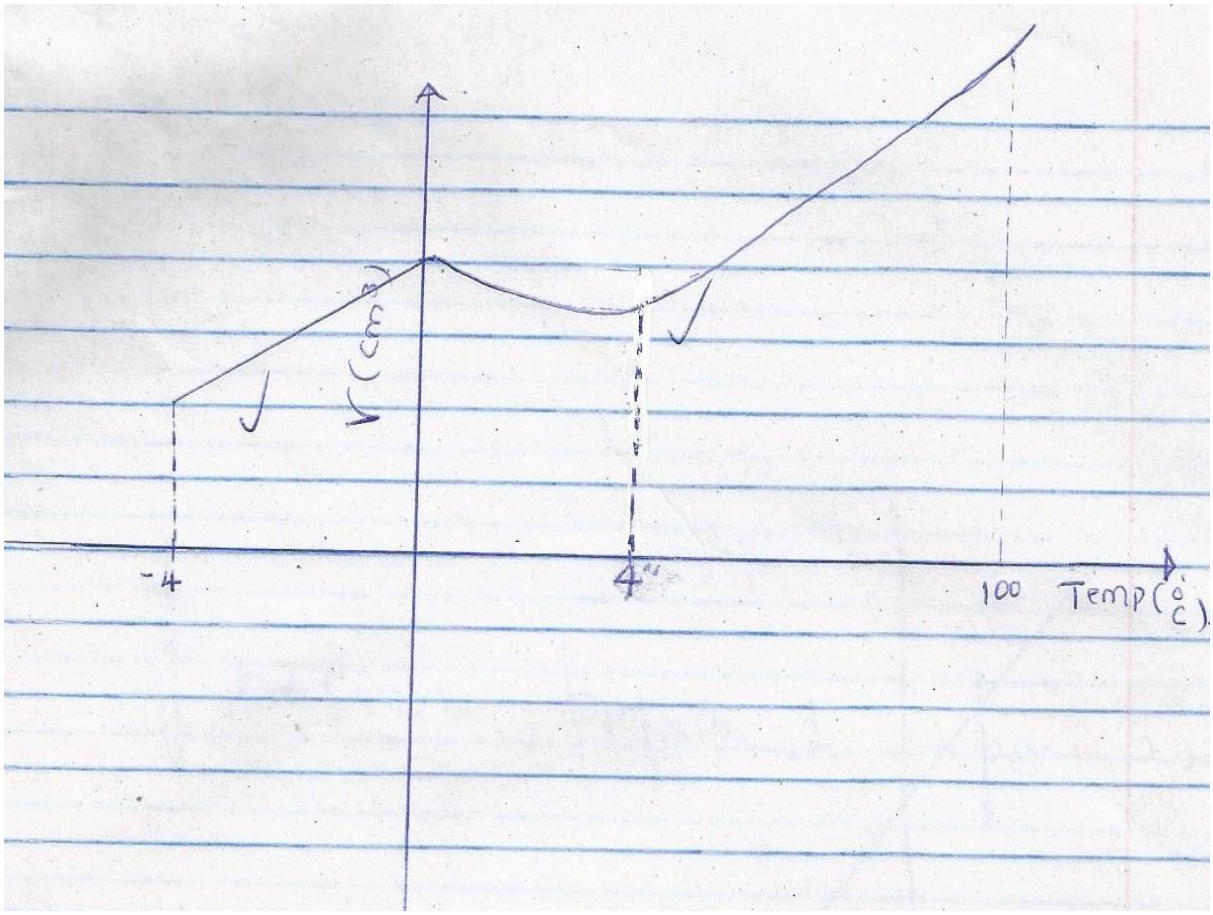
T2 = 88 + 273 = 361K

$\frac{1 \times 105}{285} = \frac{P2}{361}$

$P2 = \frac{105 \times 361}{285}$

= 126, 666.67 Pa

18. i)



ii) - Freezing of lakes and ponds
- Icebergs
- Weathering of rocks
- Bursting of water pipes

(Any three)

iii) This is because the papers traps air which a poor conductor of heat hence insulating food against heat loss.

iv) - Nature of the material (K)
- Length of the conductor (L)
- The temperature difference between the ends of the conductor (change θ)
- Cross – section Area (A) of the conductor

(Any three)

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