**ACK MOCK 2021**

**PHYSICS PAPER 1 (MARKING SCHEME)**

1. Measured diameter = 0.30

 0.03

 0.27 mm√1

 30√ sleave reading √1

 25 thimble reading √1 (3mks)

2. (i) $\frac{12000}{4}=$3000N √ 1

 (ii) P=$\frac{F}{A}$√

$\frac{3000}{80}×10000$ = 375,000pa √

3. It has a larger surface area exposed for liquid to escape/evaporate escaping with latent heat from the liquid.

4. The K.E of the smoke particles reduce and hence their movements will be slower (reduces)

5. Dull black surface is a good absorber of radiant heat while shinny is a good reflector ( 1 mk)

The heating is same since shinny has been moved closer

6. Gases have larger intermolecular distances√1

7. - Constriction√

- Narrow bore√

- High temperature range√

8. F =Ke ( 1 mk)

2 = K x 0.04

K = 50N/m ( 1 mk)

F = 50 x 0.075

 = 3.75N ( 1 mk)

9. 

10. Sum of clockwise movement= Sum of anticlockwise movement

or

√

√

=√

11. As the vehicle brakes it stretches increasing time for impact hence reducing the impulse.√

12. Lowered🗸1

As the water fills the vessel the centre of gravity rises and this lowers stability. 🗸1

**SECTION B (45 MKS)**

13. a) (i) √ - working must be shown.

 (ii) Room temperature√

 (iii) Q=Pt√

 =

 =√

 (iv) √

 √

 

 =√

v) Ml=Pt√

 √

 √

14. a) The pressure of a fixed mass of an ideal gas is directly proportional to the absolute temperature provided the volume remains constant.√

b)i) √

 

 ii) Slope of the graph

 Slope = √√= 

iii) 

 

 √

 R=12.5J/K√

 Graph P against √

 T=200K

Allow TE

c) Increase in temperature causes molecules to move faster (gain kinetic-energy √causing more number of collisions with the walls√ of cylinder at constant pressure volume increase as the molecules push √against the wall.

15. (a) Floating object displaces its own weight of the fluid in which it floats.

(b) Mass of water displaced by wood = 80kg

 Volume of water displaced = 80 = 0.08m3

 1000

 but 0.08m3 = 0.6 of the volume of block.

 Volume of wood = 0.08 = 0.1333m3;

 0.6

 Volume displaced by rods = 0.08 – 0.1333 = 0.0533

 Mass of he rods = 0.053 x 1000 = 53.3kg;

 Mass of one rod = 20g = 0.02kg

 Number of rods = 53.3;

 0.02

 = 2,665 rods;

(c)(i) Up thrust force

Weight 🗸🗸Max. 2 or 3;;

 Tension on the string 1

 Up thrust = weight + tension on the string;

(ii) Up thrust = weight + tension

 (50 x 40 x 20) 1000 x 10 = 50 x 40 x 20 x 6000 + tension;;

 1000000 100000

 Tension = 200 – 240

 = -40N

1. Sum of clockwise Moments = Anti clockwise Moments🗸1

37.5 x 40 + W x 40 = 140 x 15

1500 + 40W = 2100

40W = 2100 – 1500

40W = 600

W = 6N🗸1

W = 15N

M = 1.5Kg or 1500g

16. (a) (i) Roughness🗸 / smoothness🗸 of surface / radius of path / angular velocity/

 speed. (any two)

 (ii) WA > WB > WC🗸1



17. (a) Vertical projection U = 100m/s g = -10m/s v = om/s

V2 = u2 – 2gs🗸1

O2= (100)2 – 2 x 10 x 5

20s = 10,000

s = 500m🗸1

(b) Horizontal projection h = ½ gt2🗸1

 500 = ½ x 10 x t2

 t2 = 100

 t = 10s🗸1

(c) Range R = ut🗸1

 R = 20 x 10

 = 200m🗸1

(d) Impulse = change in momentum🗸1

 Ft = (10N x 35)🗸1 – (20N x 25)

 = -10NS🗸1

(e) (i) v – u = a

 t

 t = (5 ticks x 0.01)s

 = 0.05s🗸1

 Therefore Δv = 5cm/s2

 0.05

 Δv = 0.25cm/s🗸1

 (ii) v – u = 0.25cm/s

 u = 0.125cm

 0.01

 = 12.5cm/s🗸1

 V – 12.5 = 0.25

 V = 12.75cm/s🗸1