**SET 6**

**PHYSICS 232/1**

**MARKING SCHEMES**

**SECTION A**

1. 56 - 2 = 34 cm3√ (1)

∴ 34 = 0.68 cm3√ (1)

50

2. Taking moments about **B**

Sum of clock wise **=** Sum of Anti-clockwise moments√ (1)

⇒(100 +50) x 1.0 TA x 1.5 √ (1)

⇒ TA = 150 = 100N √ (1)

1.5

3. Air above tube Y moves at a higher velocity√ (1) than that above tube X; hence pressure above is lower than above X.

4.

mass √ (1) Straight line parallel to temperature axes

(kg)

Temperature (oc)

5. Rod A has more electrons per √ (1) unit length

6.

Velocity Velocity

(ms-1) (ms-1)

Time (s) Time (s)

Sphere (A) Sphere B

7. (a) Length of the m=barometer produced will be very long √ (1)

(b) From equation of continuity

A1 Y1 = A2 Y2 √ (1)

⇒ π (D)2 V1 = ( D)2 Y2

2 2

6 X 4 = 3 x ½ √ (1)

⇒ Y2 = 6 x4 = 8 ms-1 √ (1)

8.

√

Velocity Shape √ (1)

(ms-1) h shown √ (1)

*x*

Time (s)

h - - - - - - - - - - - - - - - - - -√

9. Container A√ (1); much heat is lost √ (1) through surface area

10. Mc Cc (80 - θ) = MW CW (θ - 20) + Mb Cb (θ -20)

⇒ 0.2 x 400(80 - θ) = 0.16 x 3900 (θ - 20) + 0.1 (θ -20)380

⇒ 6400 -80θ = 6240 - 12480 + 380 -760 √ (1)

⇒19640 = 7420

⇒θ = 26 .47 0c √ (1)

11. - Thin bulb √ (1)

- Narrow tube√ (1)

13. (a)

(bi) Flow rate = Area x Velocity

= 2.4 cm2 x 1.5 m/s

lower

= 1.6 x 10-4 m 3/s

(ii) A1 V1 = A2 V2

1.6 X 10 -4 = 20 x 2 x 10-2 x V√

1000

= 4 m/s

(iii) Mass flow = Area x density x velocity

= 2.4 x 1000 x 1.5

1000

= 0.36kg/s2

14. (i) S = ut + ½ gt2  but = u=0

S = ½ gt2

20 = ½ x 10t2

T = 25s

(ii) R = let

= 20 x 2

= 40M.

(iii) V = U + gt , but u =0

V = gt = 10 x 2

= 20/ms

(iv) F = a

A= v – u = 20 -0

2

F = ma = 50 x 10

= 500N

(v) F1 = F2

A1 A2

A2 = A1  x F2

F1

= 50 cm x 25200N

500N

A2 = 2520 cm2

15. (a) Pressure applied at a point in an enclosed fluid is transmitted equally throughout the fluid

(b) (i) P = F = 50

0.0002 ;

= 250,000 pa;

(ii) Volume displaced x = Volume received y

θ r2 d = θ R2D

d = πR2

r xr2

Effort area = R2

Load area r2

V.R = (R)2

r2

(iii) V.R = 100 ;

20

= 5;

(c) n = M. A x 100%;

V.R

16. (a) The pressure of a fixed mass of a gas is directly proportional to the absolute temperature provided

the volume is kept constant

(b) P1 = P2

T1 T2

56 = 30

293 T2

= 175.8 K

= - 97.2 0C;

(c) The lower possible temperature on the Kelvin scale

(d) P hpg;

= 2 x 1000 x 10 = 20,000 N /M2

20,000 = F

2.0 x 10-4

= 4N;

17. (a) The heat required to raise the temperature of a unit mass of a substance by 1 Kelvin

(b) (i) Mass of condensed steam = 160 – (80 + 60)

= 20g;

(ii) Heat gained by the colorimeter and water = Mw Cw x θ

= 0.06 x 390 x 20 + 0.08 x 4200 x 20

= 468 + 6720

= 7188

(ii) LV = Quantity of heat gained

Mass of steam

LV = Q

M

(B) LV = 7188

=0.02

=359400

=3.594 x105 J /kg;

18. (a) The force applied on an elastic material is directly proportional to its extension so long as the elastic limit is not exceeded.

(b) Proportionality constant = 1 ;

gradient

Gradient = 18.5 (Check students extraction)

4

4.625 N/cm

(c) - Mass per unit length

- Material of spring ;