**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 ;