**MARKING SCHEME**

**SECTION A**

1. Main scale reading 7.50mm

 Thimble scale 20 x 0.01 = 0.20

 7.70mm

2. State pressure law state that the pressure of a fixed mass of a gas is directly proportional to it’s absolute temperature provided volume is kept constant.

3. i) Position of the C.O.G.

 ii) Base area of support

4. Clock wise moment = anticlockwise moment

 40 x d = 10 (2 - d)

 40d = 20 - 10d

 40d + 10d = 20

 d = 20/50

 = 0.4m

5. A1V1 = A2V2

 A1 x 0.1 = 2.2m/s x 0.05

 A1 = 2.2m/s x 0.05

 0.1

 = 1.1m2

6. To measure temperature using a thermometer - mercury inside expands and contracts

7. - Pressure

 - Impurities



8.

9. Radiation does not require material medium for it to transfer heat. Conduction you need a material medium.

10. V.R = 2

 80/100 = M.A/2

 M.A = 1.6

 M.A = L/E

 1.6 = 50/E⇒ E = 50/1.6

E = 31.25N

11. Density = Mass

 Volume

 = 120g

 50 x 4 cm3

 = 120g

 200cm3 = 0.6g/cm3

12. Product of mass of a body and velocity (P = m x v)

13. This is the distance between two successive threads of a screw.

14. a) i) VAB = distance

 time

 = 0..5/0.01s = 50m/s2

 ii) VCD = distance

 time

 = 5.0cm = 500m/s2

 0.01s

 iii) acceleration =  v - u

 = 500m/s - 50m/s

 5 x 0.02S

 = 4500m/s2

 b) i) Work done = Area under the graph

 = (1/2 x 900J x 4m) + (900 x 4) + (1/2 x 900 x 4)

 = 1800J + 3600J + 1800J

 = 7200J

 ii) Power = force x velocity

 = 900J x 0.6m/s

 = 540 Watts

15. a) Heat lost by the metal = heat gained by cold water

 0.1kg x C x (100 - 23.4)K = 0.8kg x 4200 x (23.4 - 20)K

 C = 0.8 x 4200 x (23.4 - 20)

 0.1 x (100 - 23.4)

 C = 1491.38JKg-1K-1

 b) i) 800C

 ii) Impurities

 Pressure

 Solid only - EF

 Liquid only - BC

 Solid and liquid - DE

16. a) The rate of change in momentum is directly proportional to the force causing it and it takes place in the direction of the force.

b) i) V2 = u2 + 2as

 V2 = 0 + 2 x 10 x 75

 V = 3.87m/s

 ii) F = ma

 = 900 x 10

 = 9000J (total for four tires)

 Braking force for each tires = 9000J/4 =2250J

 iii) The breaking distance will increase because wet road offers less frictional force which is required for breaking.

 c) Spring balance B rollers reduce friction between the surfaces.

17. a) Atmospheric pressure decreases with altitude, pressure inside the body overcomes atmospheric pressure causing weak veins to burst.

 b) P = Pgh

 = 6 x 100 x 10

 = 600N/m2

 c) F = PxA

 = 0.015m2 x 4.5 x 10 pa

 = 675N

 d) Work done = Force x distance

 = 550N x 4M

 = 2200J

18. a) i) When the oil is dropped on the water surface, it lowers it’s surface tension, this causes the powder to move away this forming a patch

 ii) To make the oil patch visible

 b) i) V = 4/3π0r3

 = 4/3 x 22/7 x (0.7/2)3

 = 4.19mm3

 ii) Area = πr2

 (73..5/2)2 x 22/7

 = 1155mm2

 iii) Thickness (t) = Volume of oil drop

 Area of the patch

 = 4.19mm3

 1155mm2

 = 3.6 x 10-3mm