**PAVEMENT NATIONAL EXAMINATION**

**OPENER EXAMINATIONS 2021/2022**

**FORM IV PHYSICS PP1 (MS) 232 / 1**

QN 1. Main scale reading = 8.30 cm +

 Vernier scale reading = 0.08 cm

 8.38 cm✓ 1

QN 2. Resultant force F = Reaction – weight ✓ 1

 F +W =R

 = 60 kg (10ms-2 + 3ms -2) = 780N✓ 1

QN 3. a) – be incompressible✓

- Not corrosive✓

* Have low freezing point and high boiling point

b) The force applied on the foot pedal exerts pressure on the master cylinder ✓ 1.The pressure is

Transmitted by the brake fluid to the slave cylinder✓ 1. This causes the slave cylinder to open the brake shoe and hence the brake lining presses the drum✓ 1. The rotation of the wheel is thus resisted.

QN 4. a) V.R = 6 ✓ 1

 b) M.A = 800 = 2.941 ✓ 1

 . 272

 E = M.A x 100% = 2.941 x100✓ 1 = 49.017 %✓ 1

 V.R 6

QN 5. The motion of the particles increase ✓ 1

QN 6. The volume of a fixed mass of gas is directly proportional to its absolute temperature if the

 pressure is kept constant. ✓ 1

QN7. – Its density reduces ✓ 1

* Because during expansion the volume increases and its mass remains constant. ✓

QN 8 - A✓ 1

* In B some heat will be required to melt the ice hence the temperature will be slightly lower.✓

QN9. 7.5 N 5cm Work done = ½ force extension ✓ 1

 ? 8cm

 = ½ 12 = 0.48 J✓ 1

 8 = 12.0 N✓ 1

QN 10. Pressure applied at one point of a liquid is transmitted equally to all other parts of enclosed liquid ✓ 1

QN 11. K.E = ½ MV 2

 = ½ 920 30 2✓ 1 = 414000J ✓ 1

QN12. Because the horizontal force acting on the bullet is zero. ✓ 1

 **SECTION B (55 MARKS)**

QN 13. (a) i)- A, has higher viscosity. ✓ 1

- Because in fluid A a lower terminal velocity is registered due to the higher resistance of the fluid molecules to the movement of the sphere through it. ✓ 1

ii)

velocity (ms-1 )

Time (s)

 V tB …………………. B

 ✓ 1

 V tA …………………… A

 b) (i) A1 V1 = A2V2 ✓ 1

 100x 2 = 60 V2 ✓

 V2 = = 3.33 m/s✓ 1

1. - Liquid is non –viscous ✓ 1

- Liquid is incompressible ✓ 1

1. - As the ball rises, the atmospheric pressure on the ball reduces. ✓ 1

- At higher altitude the pressure outside is relatively lower, thus the pressure inside the balloon exceeds the one outside causing it to become fully inflated. ✓ 1

QN 14. a) The pressure of a fixed mass of a gas is inversely proportional to its volume, provided the

 temperature is kept constant. ✓ 1

b) (i)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 x 10-2 (mm) -L | ✓ ½2.44 | ✓ ½3.33 | ✓ ½3.64 | ✓ ½4.55 | ✓ ½5.56 | ✓ ½6.25 | ✓ ½8.00 | ✓ ½9.10 |



 (ii) Check graph paper

 (iii) Pressure of the air column when the length, L of air is zero

 P= 0 atmospheres ✓ 1

QN 15 a) (i) is the collision✓ in which objects combine after impact and move in one direction or become

 Stationery

1. Momentum is the ✓quantity of motion of a body given by the product of mass and velocity
2. Momentum before impact = collision after impact

1. i) S = ut + ½ at2

 ✓

✓

✓

 ✓

✓

1. When it is pulled there is tensional force on the string✓

QN 16. a) The quantity of heat required to change the state of a given mass of substance without change in

 Temperature. ✓ 1

 b) (i) Because of the hanging weights, the wire exerts pressure on the ice beneath✓ 1 it and

therefore makes it melt at a temperature lower that its melting point. ✓ 1. Once the ice has melted, the water formed flows over the wire and immediately solidifies since it is no longer under pressure✓ 1

As it solidifies, the latent heat of fusion is released and conducted by the copper wire to melt the ice below the wire ✓ 1. The process continues until the wire cuts through leaving the block intact✓ 1.

 (ii) The cotton thread would not cut through the ice at all ✓1. This is because cotton is a poor conductor of heat✓ 1 hence it would not conduct the latent heat of fusion released by the

 Solidifying ice to melt the ice below.

c) (i) Heat lost by hot water = Heat gained by cold water

MhC 🛆⊖ = McC 🛆⊖2 ✓ 1

 3 (⊖ -20) = 9 (20-10) ✓ 1

 ⊖ -20 = 30

 ⊖ = 500 C✓ 1

d) P= V2 ✓ 1 R = V2 = 240 x 240V ✓ 1

 R P 90 w

 = 640 Ω ✓ 1

QN 17 a. (i) at equilibrium, the sum of clockwise moments a point is equal to the sum of the anti-clockwise moments about the same point. ✓ 1

 (ii) Clockwise moments = Anti-clockwise moment✓ 1

W x 50cm = 55 x F ✓ 1

 F= 3N = 2.73N✓ 1

 b) (i) T = = = 0.01 s ✓ 1

 (ii)

 = 0.33m/s