**MINCKS GROUP OF SCHOOLS**

**PHYSICS PAPER** 232/1

TERM 2 2022

FORM FOUR

**MARKING SCHEME**

|  |  |
| --- | --- |
| SECTION A (25 marks) |  |
| 1. | Reading + error = ActualR = 7.57-0.04 = 7.53cm7cm8cm | 111 | Calculation of R3rd vernier scale aligningComplete vernier scale inserted correctly |
| 2. | a. Blarge area of force application implying less pressure is exerted.b. $$pressure of trapped air=P\_{atm}-\left(P \_{due to water}+P\_{mercury}\right)$$$$P\_{air}=\left(\frac{75}{100}×13600×10\right)-\left(\frac{58}{100}×1000×10+\frac{20}{100}×13600×10\right)$$Pair = 102,000 –(5800+27200) =102,000 – 33000=69,000Pa | 11111 |  |
| 3. | Uniform acceleration | 1 |  |
| 4.  | Zero acceleration (constant velocity)(W = F + U) the body has attained a terminal velocity | 11 |  |
| 5. | When the temperature increases, the gas molecules gain more kinetic energy and move faster; the rate at which they collide increase. | 11 |  |
| 6. | More stable or stability increases when the candle melts the position of COG lowers | 11 |  |
| 7. | Diffusion involves movement of matter and it can only happen when in tiny particles. | 1 |  |
| 8. | Due to the resultant downward cohesive force on the molecules on the surface of liquid, the net force on molecule inside the liquid is zero. | 11 |  |
| 9. | $$RD of paraffin=\frac{upthrust in paraffin}{upthrust in water}$$$$\frac{0.3-0.2}{0.3-0.15}=\frac{0.1}{0.15}=0.67$$$$ρ=0.67×1000=670kg/m^{3}$$ | 111 |  |
| 10. | AWhen air is blown through A, pressure inside reduces but in B remains the same.The higher atmospheric pressure outside in A makes it collapse.ALT.In A there is pressure difference between inside and outside but in B ther is no pressure difference. | 11 |  |
| 11. | Conduction involves passing of heat energy from one molecule to the next through vibration.Convection involves heated molecules moving up on becoming lighter and are replaced by colder molecules (convectional currents | 2 | tied |
| SECTION B (55 MARKS) |
| 12.  | 1.
2. Pointer
3. Note and record the initial length of the spring before loading

Record the new length after loadingGet the difference1. Weight of the mass/stretching force
2.
* Assuming elastic limit of the spring is not exceeded
* Note and record the extension of the spring and the corresponding value of the weight of the mass/stretching force.
* Increase the mass at intervals and note and record several values of extension and weight of masses in a table.
* Plot a graph of stretching force against extension.
* Note the nature of the graph (it will be a straight line through the origin.
1.

One spring = 2cmK=F/eF = 150/1000 x 10 = 1.5NK= 1.5/2  = 0.75N/cm or 75N/m | 11111111111 |  |
|  |  | 11 |  |
| 13. | 1.

F x 0.8 = (90 +20)x10 x 0.2$F=\frac{110×10×0.2}{0.8}$ =275N1. $VR=\frac{effort dist}{load dist}=\frac{0.8}{0.2}$

= 41. $MA=\frac{load}{effort}=\frac{900}{275}$

= 3.2731. $eff.=\frac{MA}{VR}×100$

$$eff.=\frac{3.273}{4}×100$$= 81.82%1. Some energy is used to lift the weight of the machine (20kg)
 | 11111111111 |  |
|  |  | 12 |  |
| 14. | 1.
2. The bulb of the thermometer is dipped in the boiling water. Should be in the steam.
3. Impuriites in water would raise its boiling point hence the mark would be higher.
4. To ensure that the steam is at normal/standard atmospheric pressure by allowing excess steam out.
5.

1000C ==🡺11-3=8cm800C🡺 80/100 x8 = 6.4cmLength = 3 + 6.4 = 9.4cm1.

Tx800CTemperature 0CTime (min)TB1. Room temperature
2. Radiation

 1. Nature of the material

 Temperature difference between the ends of the conductor1.

Large interparticle distancesThey do not have free electrons. | 111111111111 |  |
|  |  | 12 |  |
| 15. | 1. Specific latent heat of fusion of ice is the amount of heat required to change unit mass of ice completely to water at constant temperature.
2.
3. Heat lost by steam = mLv + mc∆T

$$\frac{60}{1000}×2.26×10^{6}+\frac{60}{1000}×4200×\left(100-40\right)$$= 150,720J1. miLf + mic∆T + mwc∆T + mccc∆T

3.34 x105 x mi + mi x 4200 x 40 +0.1 x 4200x40 + 0.05 x400 x 403.34 x105 x mi +168,000mi + 16800 + 800502,000mi +17,6001.

502,000mi +17,600 = 150,720$$mi=\frac{150,720-17,600}{502,,000}$$= 0.265kg or 265g | 1111111111 |  |
|  |  | 10 |  |
| 16. | 1. The direction is continously changing. This implies change in velocity hence acceleration
2.

$$ω=2πf=2×3.142×6=37.704rads /s$$a =v2/r = r$ ω$2 =37.7042x 0.6a = 852.955m/s1.
2. $\frac{50-0}{25-0}=20N/kg$
3. $\frac{P}{m}=slope$

P = m x slope = 20 x 0.2 = 4.0N1. P represent Centripetal force
 | 11112111 |  |
| TOTAL | 55 |  |
| SECTION B (55 MARKS) |  |