Subject: PHYSICS Paper code:

Year: 2024

Level: ☐ PLE ☐ UCE ☑ UACE

1(a)(i) Momentum is the product of mass of a body and its velocity ✓ (1)

(ii) Force is a push or pull that changes a body's state of rest or of uniform motion in a straight line ✓ (1)

- Product of mass and acceleration

(iii) Elastic collision is one in which kinetic energy is conserved. ✓ (1)

(b) - Every body continues in its state of rest or of uniform motion in a straight line unless acted upon by an external force ✓ (1)

- The rate of change of momentum of a body is proportion to the applied force and takes place in the direction of the force ✓ (1)

- For every action, there is an equal and opposite reaction ✓ (1)

c(i) $108\ Kmh^{-1} = \frac{1000 \times 108}{3600} = 30ms^{-1}$ ✓

$F = \frac{m(v-u)}{t} = \frac{80(0-30)}{0.1} = -24{,}000N$ ✓ or $F = \frac{80 \times 30}{0.1} = 24{,}000$ (3)

(ii) $K.E = \frac{1}{2}mu^2 = \frac{1}{2} \times 80 \times 30^2 = 36{,}000J$ ✓ (3)

mpt – 4

what – 1

d(i) One which is not associated with any units ✓ (1)

Eg. Strain, magnification, Efficiency, refractive index, Velocity ratio, relative density ✓ (1)

(ii) Product of force and time for which the force acts ✓ (1)

$[Impulse] = [Force] \times [Time]$ ✓

$= MLT^{-2}T = MLT^{-1}$ ✓ (2)

(iii) $Power = \frac{Work}{Time} = \frac{Force \times Distance}{Time} = Force \times Velocity$ ✓ (3)

Max 12

all mark

Subject: .... Paper code: ....

Level: ☐ PLE ☐ UCE ☐ UACE Year: ....

Question 2

2a) i) Force exerted on a body of mass 1kg in a gravitational field. 01

ii) Path in space followed by a satellite whose period of revolution is equal to the period of rotation of the earth. 01

b) Work done on the rocket $= \int_{\infty}^{r} F\,dr = \int_{\infty}^{r} \frac{GMm}{r^2}\,dr$

$= \frac{GMm}{r}$

$\frac{mv^2}{r} = \frac{GMm}{r}$

K.E of the rocket $= \frac{1}{2}mv^2$

$\therefore \frac{1}{2}mv^2 = \frac{GMm}{r} \Rightarrow V = \sqrt{\frac{2GM}{r}}$ 03

But $GM = r^2 g$

$\Rightarrow V = \sqrt{\frac{2r^2 g}{r}} = \sqrt{2rg}$

c)

Free Oscillations	Damped ~~Forced~~ Oscillations
- Energy is conserved	Energy is lost
- Amplitude is constant	Amplitude decreases with time
- Oscillations go on indefinately	Oscillations die out.

03

d) - Metre rule and spring are clamped vertically.

- A pointer is attached to the lower end of the spring.

- Initial Pointer position P_o is read and recorded.

- metre rule

- spring

Pointer

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Subject: .... Paper code: ....

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- One of the masses is hung on the free end of the spring and the new pointer position P_1 is recorded. Extension $e = P_1 - P_0$. P_1 ✓, e ✓
- The mass is given ~~a~~ a small vertical displacement and released. displacement ✓
- Time t for 20 oscillations is obtained. t ✓
- The period T is calculated. T ✓
- Experiment is repeated for other masses. repeat ✓
- Values are tabulated including T^2 T^2 ✓
- A graph of T^2 against e is plotted and its slope s determined. slope ✓
- Acceleration due to gravity $g = 4\pi^2/s$. $g = \frac{4\pi^2}{s}$ ✓

06

e) i, $T = \sqrt{\frac{4\pi^2 r^3}{GM}}$ OR $T = \sqrt{\frac{4\pi^2 r^3}{r_e^2 g}}$

$r = 6.4\times10^6 + 3.2\times10^6$

$= 9.6\times10^6 m$.

$\therefore T = \sqrt{\frac{4\pi^2 \times (9.6\times10^6)^3}{6.67\times10^{-11}\times5.97\times10^{24}}}$

$= 9365.62\ s$

03

$= \sqrt{\frac{4\pi^2 (9.6\times10^6)^3}{(6.4\times10^6)^2\times9.81}}$

$= 9323.36 s$.

ii) $K.E = \frac{GMm}{2r}$, $r = 9.6\times10^6 m$. OR $K.E = \frac{r_e^2 g m}{2r}$

$= \frac{6.67\times10^{-11}\times5.97\times10^{24}\times100}{2\times9.6\times10^6}$

$= 2.07\times10^9 J$

03

$= \frac{(6.4\times10^6)^2\times9.81\times100}{2\times9.6\times10^6}$

$= 2.093\times10^9 J$

20 MKS

Pg 4

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QUESTION THREE

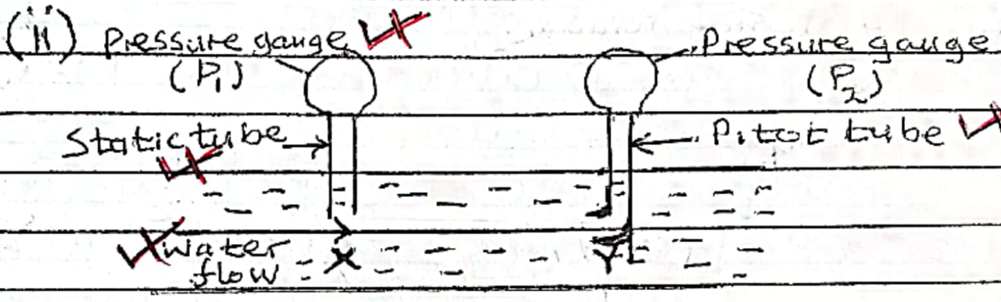
Subject: .... Paper code: ....

Level: ☐ PLE ☐ UCE ☐ UACE Year: ....

3 (a)(i) Static pressure is the pressure exerted by a fluid at rest. (1)

Dynamic pressure is the pressure exerted by a fluid due to its motion. (1)

(ii)



(2)

The static and pitot tubes are placed in the water as shown above. The readings of the pressure gauges P_1, P_2, P_X and P_Y are noted and recorded as the water is let to flow. Therefore the velocity of water 'V' is obtained from; (3)

$$V = \sqrt{\frac{2(P_Y - P_X)}{\rho}}$$, where ρ is the density of water

$V = \sqrt{2g(h_2 - h_1)}$

$V = \sqrt{2g\Delta h}$

(iii) - The water is undergoing stream line flow
- The water is incompressible
- Water is non-viscous
- Temperature of water is constant

Any Two (1)

(b)(i) For a non-viscous, incompressible fluid undergoing steady flow, the sum of pressure, kinetic energy per a unit volume and potential

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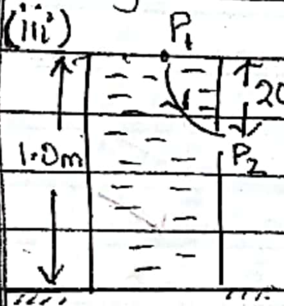
Level: ☐ PLE ☐ UCE ☐ UACE Year: ....

energy per a unit volume is always constant at any point along a stream line. (1)

(ii) As the gas leaves the hose pipe into the burner, it leaves with high speed causing a low pressure compared to the stationary air outside which is at a relatively higher pressure. The pressure difference forces the air into the burner causing the gas to continously be burnt at the top. (3)

(iii)



$$P_1 + \frac{1}{2}\rho V_1^2 + h_1\rho g = P_2 + \frac{1}{2}\rho V_2^2 + h_2\rho g$$

$P_1 = P_2$, $V_1 = 0\,ms^{-1}$ $V_2 = \sqrt{2hg}$

$V_2^2 = 2(h_1 - h_2)g \Rightarrow V_2 = \sqrt{2(h_1-h_2)g}$ (3)

$V_2 = \sqrt{2 \times 20 \times 10^{-2} \times 9.81} = \underline{\underline{1.981\,ms^{-1}}}$

(c)(i) If a body is partially or wholly immersed in a fluid it experiences an upthrust that is equal to the weight of the fluid displaced. (1)

(ii) Let the volumes of Iron and Aluminium be, V_1, V_2

$\therefore V_1 + V_2 = 100$ ——(1)

$\rho_1 = 8 \times 1 = 8\,g/cm^3$, $\rho_2 = 2.7 \times 1 = 2.7\,g/cm^3$

Mass of Iron, $m_1 = 8V_1$ and of Aluminium, $m_2 = 2.7V_2$

$\Rightarrow 8V_1 + 2.7V_2 = 588$ ——(2) Now, $V_2 = 100 - V_1$ (4)

$\therefore 8V_1 + 2.7(100 - V_1) = 588$

$8V_1 + 2.7 \times 100 - 2.7V_1 = 588$

$\Rightarrow 5.3V_1 = 318$ $\therefore V_1 = \underline{60\,cm^3}$

and $V_2 = 100 - 60 = \underline{40\,cm^3}$

i.e proportions of Iron and Aluminium $= \underline{3/5}$ and $\underline{2/5}$

20

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QUESTION 4 **DRAFT**

Subject: .... **Paper code:** ....

Level: ☐ PLE ☐ UCE ☐ UACE **Year:** ....

4(a)(i) A material which regains its original shape or ~~length~~ size after the deforming force has been removed. (01)

(ii) Work done to stretch material by e_1, $W_1 = \frac{1}{2}F_1e_1$

where $F_1 = Ke_1$ $\Rightarrow W_1 = \frac{1}{2}Ke_1^2$

$E = F.Ex$

$E = \int_{e_1}^{e_2} Kx\,dx$

Similarly, for an extension e_2, work done is given by $W_2 = \frac{1}{2}Ke_2^2$

$\frac{1}{2}x(e_2^2 - e_1^2)$

Thus to stretch the material from extension e_1 to e_2, $E = W_2 - W_1 = \frac{1}{2}Ke_2^2 - \frac{1}{2}Ke_1^2$ (04)

$= \frac{1}{2}K(e_2^2 - e_1^2)$

(iii) When a material (elastic) is stretched, the atoms are displaced slightly from their equilibrium positions. Thus energy used to stretch the material is stored as elastic potential energy.

When the stretching force is removed, the atoms spring back to their original positions. Here, the energy that was ~~used~~ (stored as elastic potential energy) is transformed into kinetic energy of the atoms as the material returns to the original length. (03)

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QUESTION 4 DRAFT

Subject: ....

Paper code: ....

Level: ☐ PLE ☐ UCE ☐ UACE

Year: ....

4(a)(i) A material which regains its original shape or ~~length~~ size after the deforming force has been removed

(ii) work done to stretch material by e_1, $W_1 = \frac{1}{2}F_1 e_1$

where $F_1 = ke_1$ $\Rightarrow W_1 = \frac{1}{2}ke_1^2$

Similarly, for an extension e_2, work done is given by $W_2 = \frac{1}{2}ke_2^2$

Thus to stretch the material from extension e_1 to e_2, $E = W_2 - W_1 = \frac{1}{2}ke_2^2 - \frac{1}{2}ke_1^2$

$= \frac{1}{2}k(e_2^2 - e_1^2)$

(iii) When a material (elastic) is stretched, the atoms are displaced slightly from their equilibrium positions. Thus energy used to stretch the material is stored as elastic potential energy.

When the stretching force is removed, the atoms spring back to their original positions. Here, the energy that was ~~used~~ (stored as elastic potential energy is transformed into kinetic energy of the atoms as the material returns to the original length

DRAFT

Subject: QN 4 CTD

Paper code: ....

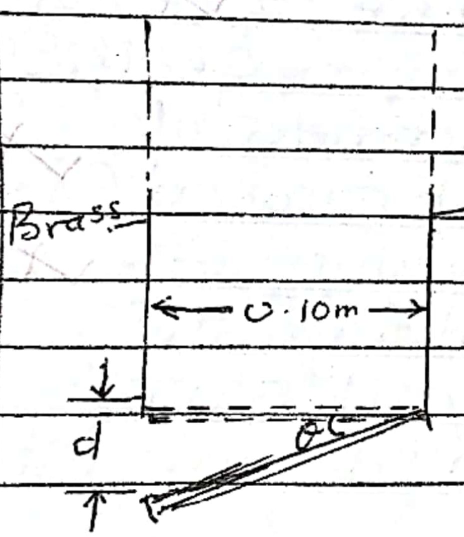
Level: ☐ PLE ☐ UCE ☐ UACE

Year: ....

4(b)(i) - original length of the specimen wire
- extension produced for each wire
- Diameter of the wire
- The loads (weights) (02)

(ii) Two wires are used to eliminate errors due to:
- Changes in temperature of the wires
- yeilding of the support when the loads are added (02)

(c)



(i) Difference in extension = d

$\Rightarrow \frac{d}{0.10} = \tan 2°$ (02)

$d = 0.10 \tan 2°$

$= 3.49 \times 10^{-3} m$

(ii) Young's modulus $Y = \frac{FL}{Ax} \Rightarrow x = \frac{FL}{YA}$

where x = extension for a force F.

But force, F in the steel wire $= \frac{100}{2} = 50N$ as the 100N force is applied at the centre of the bar (0

The 100N force is applied at the Centre of the bar

$\therefore$ For steel, $x = \frac{50 \times 2.0}{2.0 \times 10^{11} \times 3.14 \times (0.40 \times 10^{-3})^2}$

$= 9.95 \times 10^{-4} m$ 2

Extension of Brass $= d + x = 3.49 \times 10^{-3} + 9.95 \times 10^{-4}$
$4.485 \times 10^{-3} m$

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DRAFT

20/20

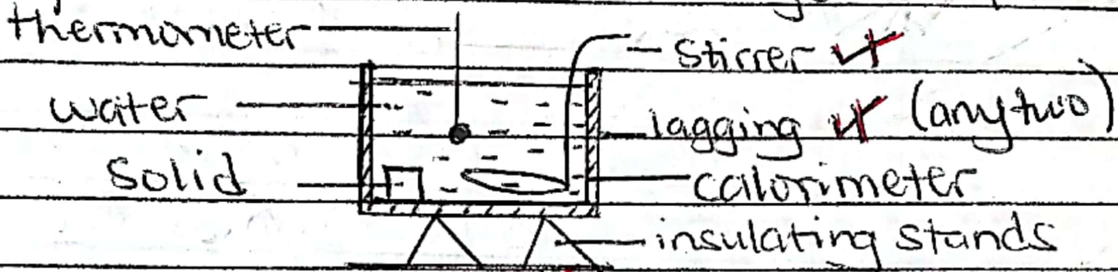
Subject: .... **Paper code:** ....

Level: ☐ PLE ☐ UCE ☐ UACE Qn 5 **Year:** ....

5 (a) (i) Is the quantity of heat required to raise the temperature of 1kg mass of a substance by 1K ✓

(ii) Is the quantity of heat required to change the phase of a substance without change in temperature. ✓ 2

(b)(i)



Measure the mass m of the solid. Heat the solid to a high temperature θ_1. Pour water of mass m_1 and known specific heat capacity C_1 in a calorimeter of mass m_2 of specific heat capacity C_2. Note and record their temperature θ_2. Quickly transfer the solid into the water, stir the mixture and record the final maximum observed temperature θ_3 6

Heat lost by Solid = Heat gained by water + Heat absorbed by calorimeter

$$mc(\theta_1-\theta_3) = m_1C_1(\theta_3-\theta_2) + m_2C_2(\theta_3-\theta_2)$$

∴ S.H.C of solid

$$C = \frac{(m_1C_1+m_2C_2)(\theta_3-\theta_2)}{m(\theta_1-\theta_3)}$$

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Subject: .... Paper code: ....

Level: ☐ PLE ☐ UCE ☐ UACE Year: ....

Qn 5

(b)(ii) Calorimeter is fully lagged.
mixture is stirred. (any two) 2
Solid is transfered quickly.

c) (i) $Pt = C(\theta_2-\theta_1) + mc(\theta_2-\theta_1)$
$(2.2\times10^3)t = 400(100-25) + 2\times4200(100-25)$ $2\frac{1}{2}$
$t = 300s$

(ii) $Pt = ml$
$2.2\times10^3\times3\times60 = (2-1.802)l$
$l = 2.0\times10^6 Jkg^{-1}$ $2\frac{1}{2}$

d) In a solid the molecules are very close together with strong forces of attraction and solid has a regular pattern. To change a solid to liquid the forces are weakened, and the regular arrangement is broken to allow the molecules flow in liquid state. The change involves negligible change in volume, hence negligible external work done in pushing back the atmosphere. 5

In a liquid the molecules are fairly far apart and there exists weak forces of attraction. Change from liquid to vapour phase involves ~~complete change from liquid to vapour phase~~ ~~involves~~ complete breakage of bonds so that the molecules move freely as gas molecules. The change is accompanied by very large volume change hence a great deal of external work is done 20

DRAFT

Subject: QUESTION SIX Paper code: ....

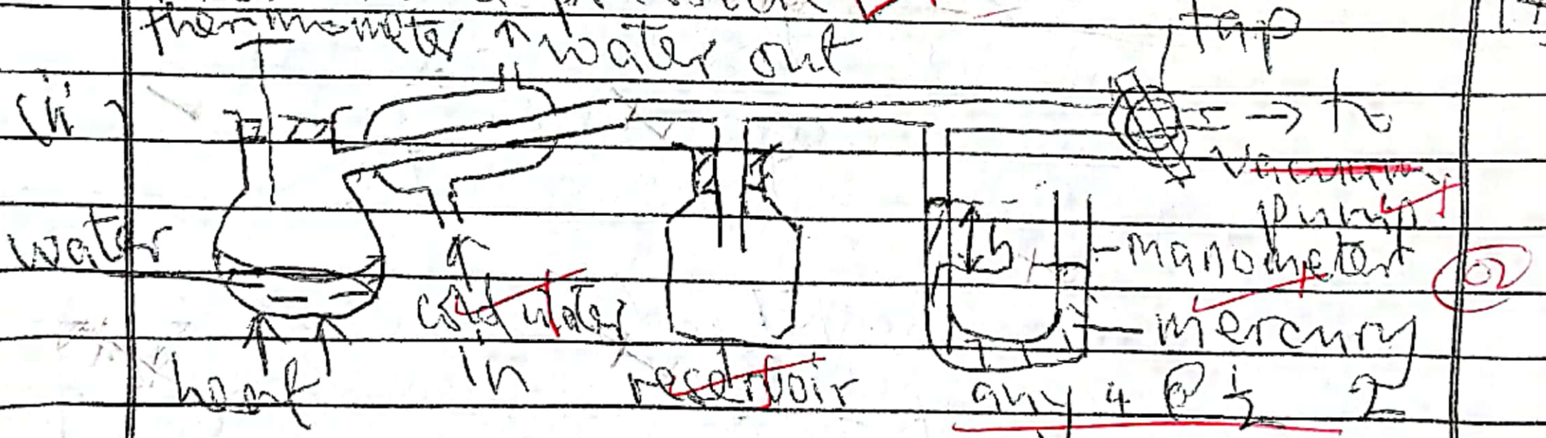
Level: ☐ PLE ☐ UCE ☐ UACE Year: ....

6. a) (i) Is a vapour which is in dynamic equilibrium with its own liquid.

(ii) Pressure a component gas would exert if it alone occupied the volume occupied by the mixture. (1)

b) (i) When the temperature is increased the molecules move faster and acquire high kie which implies that high force is exerted by the molecules. More molecules leave the liquid into vapour thus increasing the density of the vapour. This leads to more collisions per unit time thus increased pressure. (4)

(ii)



any 4 @ ½ 2

value of the atmospheric pressure H is obtained from a barometer and recorded. Air is drawn from the reservoir by opening the tap and using a vacuum pump. tap is closed and water heated gently.

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until it boils steadily. Temp. θ of vapour and difference in mercury levels, h are recorded. S.V.P = H ± h (3

6 c) (ii) Ideal gas obeys the gas laws at all conditions (1)

(iii) Volume of molecules is negligible compared to vol. of container. Inter molecular forces are negligible. (2)

d) (i) $PV = nRT \Rightarrow 10\times10^{3}\times80\times10^{-6} = n\times8.31\times300$

$\therefore n = 3.21\times10^{-4}$ mole

No of molecules, $N = n\times N_A = 3.21\times10^{-4}\times6.02\times10^{23}$

$\Rightarrow N = 1.93\times10^{20}$ molecules 3

(ii) $P = \frac{1}{3}\rho\bar{c^2} = \frac{1}{3}\left(\frac{M}{V}\right)\bar{c^2}$

mass $= nM = 3.21\times10^{-4}\times0.018 = 5.778\times10^{-6}$ kg

$10\times10^{3} = \frac{1}{3}\times5.778\times10^{-6}\times\bar{c^2}$

$\therefore \bar{c^2} = 415,368.6$ $\therefore \sqrt{\bar{c^2}} = 644.5\ ms^{-1}$ (3)

OR $\sqrt{\bar{c^2}} = \sqrt{\frac{3RT}{M}} = \sqrt{\frac{3\times8.31\times300}{0.018}} = 644.5\ ms^{-1}$ (3)

20

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Subject: .... **Paper code:** ....

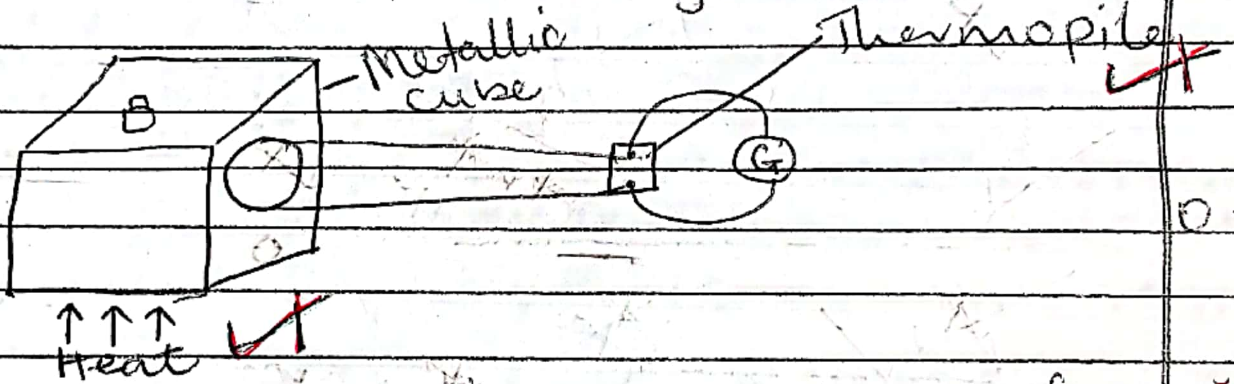
Level: ☐ PLE ☐ UCE ☐ UACE **Year:** ....

Question Seven

7 a) i) Power radiated by a black body per 1m² surface area is proportional to the fourth power of the absolute temperature of the body. 0

ii) Wavelength of Radiation emitted with maximum intensity is inversely proportional to the absolute temperature of the black body. 01

b)



01

- A metallic cube is made and each face is given a different finish.
- The cube is filled with water which is heated until it boils. hot water
- A thermopile is placed to face one of the faces and the deflection on the galvanometer noted. 03
- Procedure is repeated for the other face at the same distance from the thermopile.
- It is observed that the deflections from the two faces are different.
- This shows that the rate of heat loss depends on the nature of the surface.

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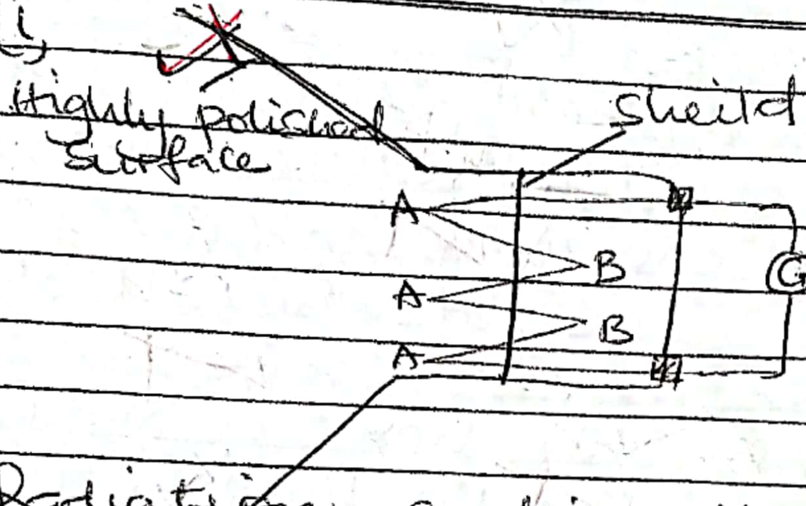
Subject: .... Paper code: ....

Level: ☐ PLE ☐ UCE ☐ UACE Year: ....

7 c) i,



any two parts ½ each

A – hot Junctions

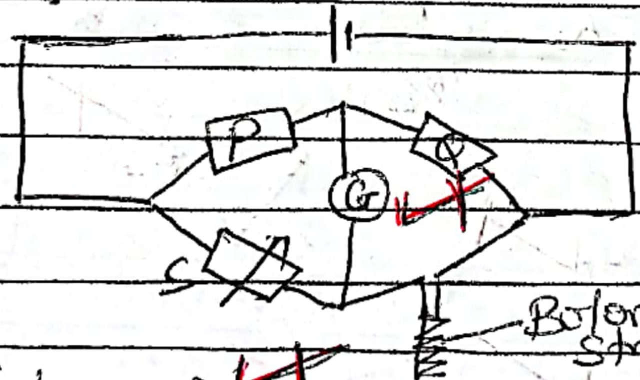
B – Cold Junctions

01

Radiation reaching the Junctions A, they absorb causes increase in temperature while Junctions B are shielded from radiation. 02

Temperature difference between A and B causes a flow of current which is detected by deflection of the sensitive galvanometer.

ALT;



any two ½ each 01

- Initial resistance of the bolometer strip is determined. OR adjust S until zero deflection
- Radiation falls on the strip, is absorbed and temperature increases. 02
- New resistance is determined OR deflection is observed.
- Difference in resistance / Deflection shows that radiation has been detected

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7C

7c)(i) When heat is applied to one side of a fluid, the fluid there expands and the density of the fluid reduces. The less dense fluid moves up and is replaced by the cooler denser fluid which is also heated. This sets up a convection current. In this way, heat is transferred from the hotter part of the fluid to the cooler part. 03

d)i) One that absorbs all radiations falling on it 01

ii) Means the relative intensities of the different wavelengths in the radiation 01

iii) A body at 1000K radiates radiations whose wavelength lies predominantly in the red region of the spectrum and hence appears red-hot. At 2000K, other wavelengths in the visible spectrum are emitted and therefore overlap to produce white light hence body appears white-hot. 02

e) $P = \sigma A T^4$

$0.5 \times 10^3 = 5.67 \times 10^{-8} \times 2\pi r h \times (693.5 + 273)^4$

$5 \times 10^2 = 5.67 \times 10^{-8} \times 2\pi \times d/2 \times 2.0 \times 10^{-2} \times (966.5)^4$

$d = \dfrac{5 \times 10^2}{3.1086 \times 10^4}$ 04

$= 1.61 \times 10^{-2}\,m$

DRAFT

Subject: .... Paper code: ....

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QUESTION 8

8ai) Threshold frequency is the minimum frequency of the incident radiation required for photo-electric emission to occur 1

ii) Work function is the minimum energy required to remove an electron from a metal surface 1

b According to the classical wave theory, energy is spread uniformly over the wave fronts. therefore there is little energy available for each surface electron. Time has to elapse for an electron to accumulate sufficient energy before it is ejected from the metal surface 3

ci) The leaf of the electroscope is seen to collapse. U.V. light causes electrons to be emitted from the zinc plate. Electrons flow from the leaf and plate to the zinc plate 3

ii) There is no observable change in divergence of the leaf since infrared radiation is of low frequency and does not carry enough energy required for photo-electric emission. 2

d Energy of a photon, $E = \frac{hc}{\lambda} = \frac{6.6\times10^{-34}\times3.0\times10^{8}}{546\times10^{-9}}$

$E = 3.626\times10^{-19}\,J$

No of Photons per second $= \frac{0.080}{3.626\times10^{-19}}$

$= 2.2\times10^{17}$

DRAFT

Subject: Question 8 Cont. Paper code: ....

Level: ☐ PLE ☐ UCE ☐ UACE Year: ....

No of electrons liberated per second $= \frac{2.0 \times 2.2 \times 10^{17}}{100}$

$n = 4.4 \times 10^{15}$

Photocurrent, $I = n.e$

$= 4.4 \times 10^{15} \times 1.6 \times 10^{-19}$

$= 7.04 \times 10^{-4}$ A 5

i) Intensity of x-rays is controlled by varying the filament current

Quality of x-rays is controlled by varying the accelerating (operating) p.d across the tube 2

Accept: Intensity of x-rays is controlled by varying the tube voltage.

i) $2d\sin\theta = n\lambda$

For Minimum ~~maximum~~ θ; $n = 1$

$2d\sin\theta = \lambda$

$2 \times 2.0 \times 10^{-10} \sin\theta = 7.0 \times 10^{-11}$ 3

$\therefore \theta = 10.1^{\circ}$

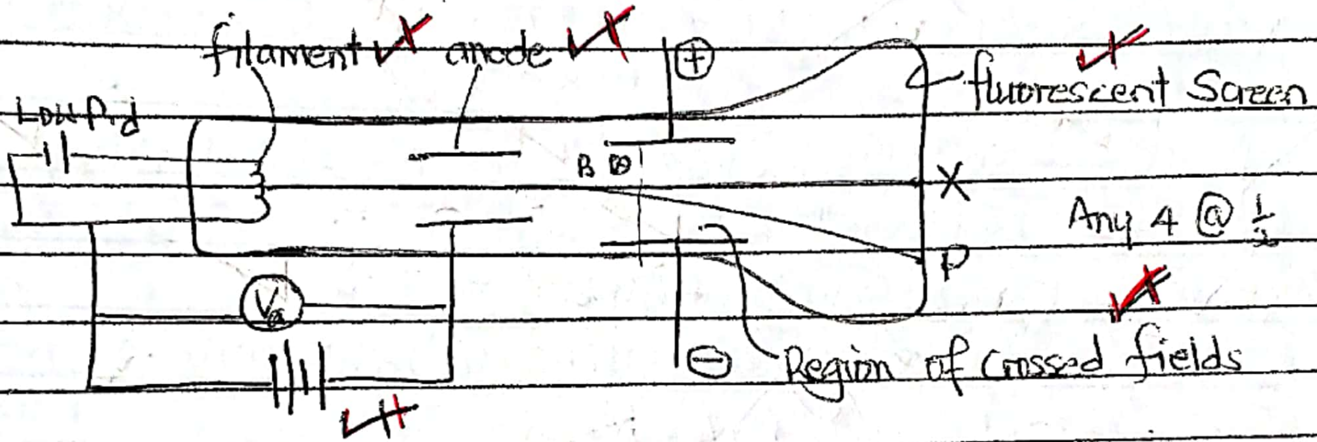
TOTAL 20 MARKS

Subject: Question Nine　　　Paper code: P510/1

Level: ☐ PLE ☐ UCE ☐ UACE　　　Year: ....

Number of molecules (Particles) in one mole of a Substance (1)

Charge to mass ratio (of an ion/electron/particle) (1)



Any 4 @ $\frac{1}{2}$ (2)

The filament is heated by Low P.d and it emits electrons by thermionic emission. Electrons are accelerated by p.d Va between the cathode and anode. When the electric and magnetic fields are both off, electrons strike the screen at X. Point X is noted

e
acc
x

$eV_a = \frac{1}{2}mv^2 \Rightarrow \frac{e}{m} = \frac{v^2}{2V_a}$

The magnetic field of flux density B is switched on and the beam is deflected to strike the screen at point P.

The electric field of intensity E is switched on and adjusted until the beam is back to X.

Magnetic force = Electric force

$BeV = Ee \Rightarrow V = E/B$ (4)

$\frac{e}{m} = \frac{E^2}{2V_aB^2}$

(i) $W = F + U$ but $U = 0$

$\frac{4}{3}\pi r^3 \rho g = 6\pi \eta r V_o \Rightarrow r^2 = \frac{9\eta V_o}{2\rho g} = \frac{9 \times 1.8\times10^{-5} \times 2.5\times10^{-4}}{2\times900\times9.81}$

$r = 1.51\times10^{-6}$ m

Qn 9

Pg 18

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DRAFT

Subject: 9 Cont. **Paper code:** ....

Level: ☐ PLE ☐ UCE ☐ UACE **Year:** ....

$\Rightarrow \frac{4}{3}\pi r^3 \rho g = \frac{VQ}{d}$

$\frac{4}{3}\pi (1.51\times10^{-6})^3\times900\times9.81 = \frac{2387}{1.5\times10^{-2}} Q$, $Q = 8.00\times10^{-19} C$

$Q = ne \Rightarrow 8\times10^{-19} = n\times1.6\times10^{-19}$ $\therefore n = 5.0$ electrons (5)

(ii) $Q = 7e = 7\times1.6\times10^{-19}$ C

$W + F = F_e \Rightarrow \frac{4}{3}\pi r^3\rho g + 6\pi\eta r V_1 = EQ$

$\frac{4}{3}\pi (1.51\times10^{-6})^3\times900\times9.81 + 6\pi(1.8\times10^{-3})\times1.51\times10^{-6} V_1 = \frac{2387\times7\times1.6\times10^{-19}}{1.5\times10^{-2}}$

$1.2733\times10^{-3} + 5.123309\times10^{-10} V_1 = 1.77557\times10^{-13}$

$V_1 = 9.80\times10^{-5} ms^{-1}$ (4)

(d) The unknown a.c voltage whose peak value is to be measured is connected to the y-plates.
With the time base off, the vertical line on the screen is centred and its length measured.
The peak-to-peak voltage is obtained by multiplying the length with the y-sensitivity (V/cm) setting. (3)
(or comparison with length corresponding to a known a.c voltage).

Subject: QUESTION TEN

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(10) (a)(i) It is the ~~total~~ number of protons and neutrons in the nucleus of an atom. (1)

(ii) This is the time taken for the number of radioactive atoms to decay to half their initial number. (1)

(b) The rate of ~~disintegration~~ decay of radioactive atoms is directly proportional to the number of atoms present. (1)

$\frac{dN}{dt} \propto N \Rightarrow \frac{dN}{dt} = -\lambda N$

$\therefore \int \frac{dN}{N} = \int -\lambda dt \Rightarrow \ln N = -\lambda \int dt$

$\therefore \ln N = -\lambda t + c$, when $t = 0$, $N = N_0$

$\therefore \ln N_0 = 0 + c \Rightarrow c = \ln N_0$

$\therefore \ln N = -\lambda t + \ln N_0 \Rightarrow \ln N - \ln N_0 = -\lambda t$ (4)

$\ln\left(\frac{N}{N_0}\right) = -\lambda t$ and $\frac{N}{N_0} = e^{-\lambda t}$

$\therefore N = N_0 e^{-\lambda t}$

(c)(i) - Kills cancer cells.

- Detects leakages in underground pipes. (2)
- Radioactive dating

Any TWO

(ii) - Kill body cells

- Causes genetic mutation

Any TWO (1)

- eye blindness.

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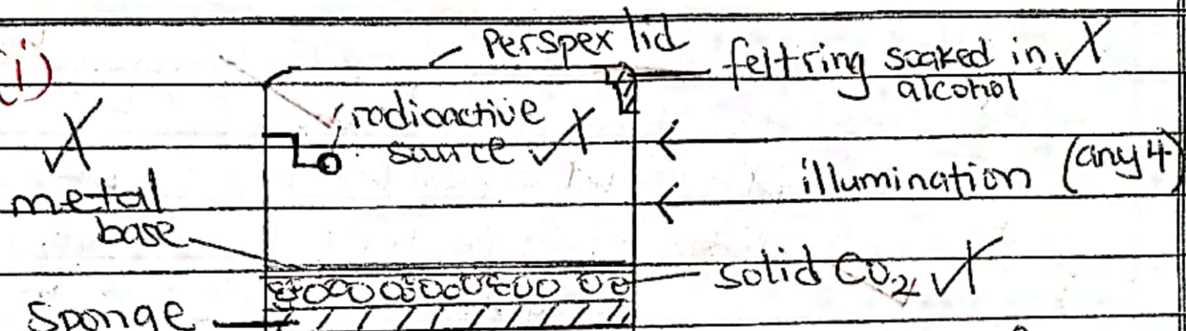
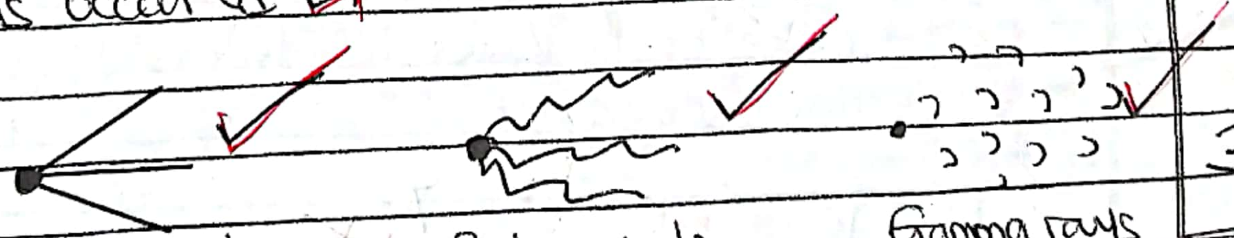
d(i)



Air in the chamber is saturated by the vapour from the felt pad. Top of chamber is at room temperature and the bottom of the chamber is at very low temp due to CO_2. This creates a temp. gradient btn the top and bottom of the chamber. The saturated air diffuses downwards into the cooler region until it becomes supersaturated. The source of radiation is exposed and the air in the chamber is ionised. The supersaturated vapour condenses on the ions. Then tracks of droplets are viewed when light is reflected from them. When chamber is illuminated by strong light thickness and length of paths formed shows the extent to which ionisation has occured (7)

(ii)



Alpha particle Beta particle Gamma rays 3

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