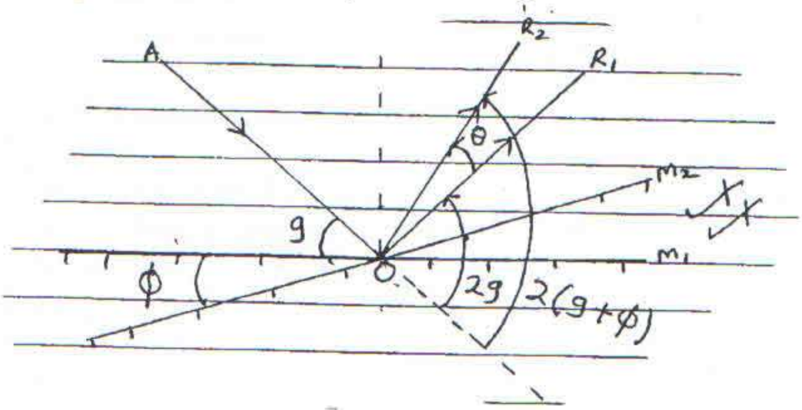
WAKISSHA JOINT MOCK EXAMINATIONS
MARKING GUIDE
Uganda Advanced Certificate of Education
UACE August 2019
PHYSICS P510/2

1. (a) (i) - The incident ray, reflected ray and the normal at the point of incidence, all lie in the same plane.
- The angle of incidence is equal to the angle of reflection.

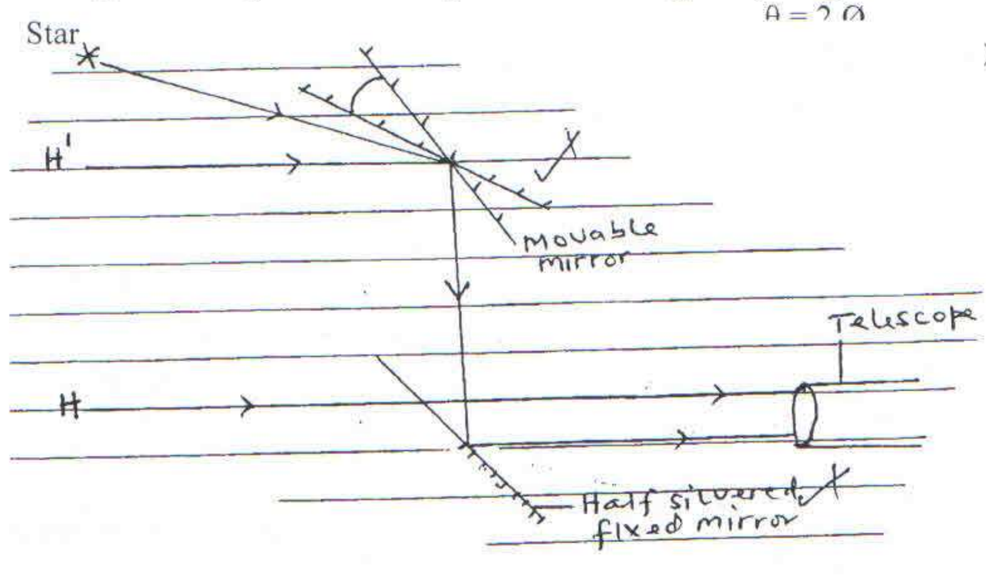
(ii)



02 marks

A constant ray of light AO is incident onto a plane mirror in position m_1 and it is reflected along OR_1.The glancing angle = g
Deviation d = 2g .
When the mirror is turned through angle Ø,the new glancing angle = (g + Ø) and the new deviation =2(g+Ø)
The angle θ through which the ray rotates is θ = 2(g + Ø) – 2 g
θ = 2 Ø

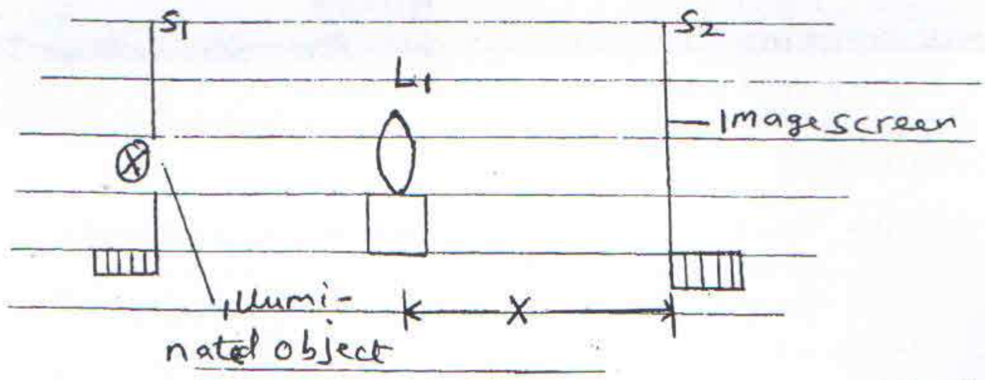
04 marks



First the movable mirror is rotated until the image of the horizon H[1] is seen to coincide with horizon, H. The position of the mirror or pointer on the scale is noted. At this point the movable mirror and the fixed half mirror are parallel.

The movable mirror is now rotated until the image of the star is seen to coincide with the horizon, H. The angle of rotation, θ is measured. The angle of elevation is 2 θ. 05 marks

(c) (i)



04marks

An illuminated object is placed at a distance greater than the focal length of the lens and the apparatus are set as shown above.
The screen S_2 is adjusted until a sharp image is formed on it. The distance X between L_1 and S_2 is measured. The convex mirror whose focal length is required is placed coaxially between L1 and S_2.The mirror is adjusted until a sharp image is focused on S_1 adjacent to the object. The distance, y between L_1 and the mirror is measured. The focal length, f is calculated from $f = \frac{x-y}{2}$

04marks

(d) fg = 25cm, fc = 30cm

$$\frac{1}{fc} = \frac{1}{fg} + \frac{1}{fl} \Rightarrow \frac{1}{30} = \frac{1}{25} + \frac{1}{fl} \Rightarrow \frac{1}{fl} = \frac{1}{150}$$

Also $\frac{1}{fg} = (ng - 1).\frac{1}{r} \Rightarrow \frac{1}{25} = (1.5 - 1).\frac{2}{r} \Rightarrow \frac{1}{r} = \frac{1}{25}$

$\therefore$ for the liquid $\frac{1}{fl} = (n_L - 1).\frac{1}{r} \Rightarrow -\frac{1}{150}(n_L - 1). -\frac{1}{25}$

$\therefore n_L = 1.17$

05marks

TOTAL = 20MARKS

2. (a) (i) Refraction is the change in the direction of light as it travels from one medium into another.

01mark

OR
Refraction of light is the bending of a light ray as it travels from one medium to another.

01 mark

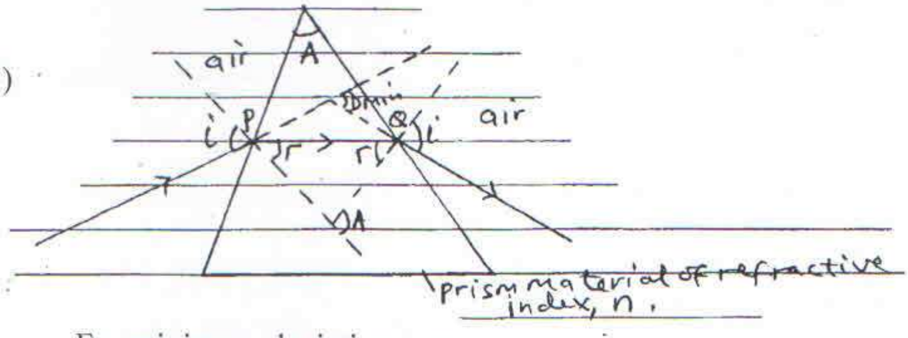
(ii) Critical angle is the angle of incidence in the dense medium for which the angle of refraction in the less dense medium is 90^0.

(b) Two glass slides are cemented together to form an air cell. The air cell is dipped into water in a parallel sided transparent vessel. A narrow beam of light is directed on to the air cell and is viewed from the opposite side.
The air cell is then turned/rotated in one direction until light just disappears. This position is noted. The air cell is then turned in opposite direction until light just

disappears again. This position is noted. The angle between the two positions is measured, θ. The critical angle, $C = \frac{\theta}{2}$.

04marks

(c) (i)



For minimum deviation to occur

$i_1 = i_2 = i$

and $r_1 = r_2 = r$

Using n sin i = constant at P and Q

1 sin i = n sin r

$n = \frac{\sin i}{\sin r} - - - 1$

Also r + r = A ⇒ 2r. = A ⇔ $r = \frac{A}{2} - - - 2$

Minimum deviation

D min = (i - r) + (i – r) = 2 i – A

⇔ 2 i = Dmin + A

$i = \frac{Dmin+A}{2} - - - - - 3$

From 1, 2 and 3

$N = \frac{\sin\left(\frac{A+Dmin}{2}\right)}{\sin^{A}/_{2}}$

04marks

(ii) From the diagram below, using Snell's law

Apply snell's law at Q

n sin i = constant

1.50 sin c = 1 sin 90^0 = 1

Sin c = $^1/_{1.50}$ = 0.667

C = $\underline{41.8^0}$

But r = A – C = 60 – 41.8 = 18.2^0

Applying snell's law at P

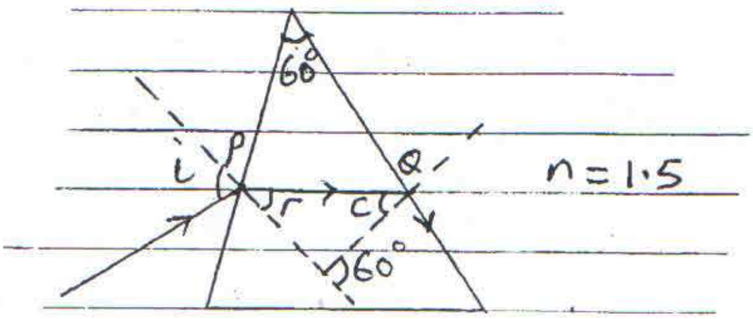
1.5 sin r = 1 sin i

1.5 sin 18.2^0 = sin i

Sin i = 0.4685

i = $\underline{27.9^0}$

04marks



d) (i) Magnifying power of an optical instrument is the ratio of the angle subtended by the final image at aided eye to the angle subtended by the object at the un aided eye.

01mark

(ii) A compound microscope is used to view nearby objects while a telescope is used to view distant objects.

The compound microscope an objective of short focal length whereas the telescope has an objective of long focal length.
In normal adjustment, the final image is formed at near point where as in the telescope, the final image is at infinity.

02 marks

(20 marks)

e) Action of the objective lens.

$\frac{1}{V_o} + \frac{1}{u_o} = \frac{1}{f_o}$

$\frac{1}{V_o} = \frac{1}{f_o} - \frac{1}{u_o}$

$\frac{1}{1} - \frac{1}{1.1}$

$V_o = 11.0cm$

Action of the eye piece.

$\frac{1}{u_e} + \frac{1}{f_e} = \frac{1}{u_e}$

$\frac{1}{5} - \frac{1}{30}$

$ue + 4.3cm$

ue = 4.3cm

Lens separation.
= ue + V_o
= 4.3 + 11.0
= 15.3cm

03 marks

3. (a) (i) A harmonic is one of the frequencies that can be produced by a particular instrument .(string or pipe) 01 mark

OR

A note whose frequency is an integral multiple of the fundamental frequency.

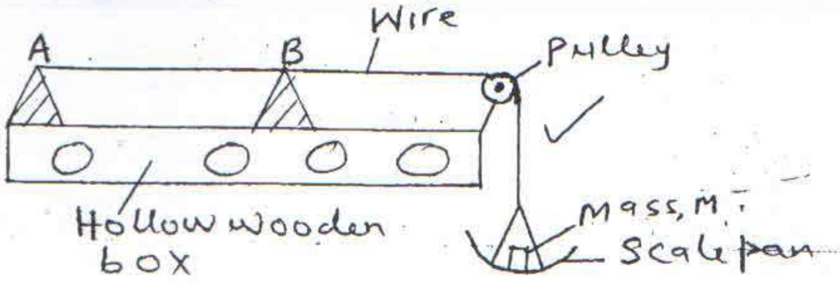
(ii) V $\sqrt{\frac{T}{N}}$ and $f_0 = \frac{V}{2l} \therefore f_0 = \frac{\sqrt{\frac{T}{N}}}{2l}$

$f_0 = \frac{\sqrt{\frac{200}{0.01}}}{2x1} = 141.4H_2$ $N = \frac{0.01}{1.0} = 0.01kgm^{-1}$

∴ Frequency of the 2nd harmonic
= 2 f_0= 2 x 70.71 = 141.4Hz.

03 marks

(b)



The length, *l* between the bridges is fixed. A suitable load, m is attached to the free end of the wire. The wire is plucked in the middle and a vibrating tuning fork of known frequency, f placed near it. The mass, m is varied until a loud sound is heard.

The mass, m and the corresponding frequency, f are recorded in a table including values of f^2.
The procedure is repeated with tuning forks of different frequencies, f
A graph of f^2 against m is plotted and a straight line through the origin is Obtained.
This implies that $f^2 \propto m$ but $T = mg \Rightarrow m = \frac{T}{g}$

$\Rightarrow f^2 \propto T$ since g is constant and $f \propto \sqrt{T}$.

05 marks

(c) (i) Doppler effect is the apparent change in the frequency of wave motion due to relative motion between the source and the observer.

01 mark

(ii) Apparent wave length reaching the observer $\lambda^1 = \frac{V+u_s}{f}$

Apparent velocity of sound received, $V^1 = V - \mu o$

$\therefore Apparent\ frequency\ f' = \frac{v}{\lambda'} = \left(\frac{v-uo}{v+us}\right)$

$= \left(\frac{330-20}{330+30}\right) \times 600$

$f' = \underline{516.7\text{Hz}}$

$03marks$

(d) (i) Beats are a periodic rise and fall in the intensity of sound heard when two notes of nearly equal frequencies but similar amplitudes are Sounded together. 01 mark

(ii) When two waves of nearly equal frequencies and similar amplitudes are Sounded together, they meet and super pose. When they meet in phase, constructive interference takes place and a loud sound is heard. When they meet completely out of phase destructive interference takes place and soft sound is heard. A periodic rise and fall in intensity (or loudness) of sound is heard which is called beats.

03marks

(e) At the mouth of the pipe the air is free to move and therefore the displacement of air molecules is large and the pressure is low. At the closed end the molecules are less free and the displacement is minimal (or zero) and the pressure is high.

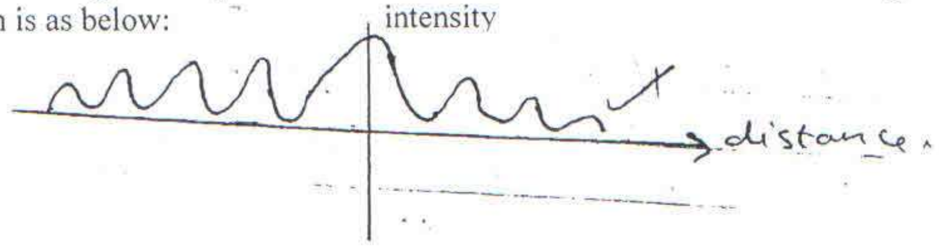
03marks

TOTAL = 20MARKS

4. (a) Diffraction is the spreading of light waves beyond their geometrical shadows/ boundaries leading to interference. 01mark

(b)

Consider a straight wave front arriving at a narrow gap XY between the Barriers .Each point on the wave front acts as a secondary source of wave lets. All the secondary sources are coherent and the combined effect of the waves at any point, such as A or B is the sum of the effect of the individual waves at that point. At point A equidistant from X and Y all the waves arrive in phase. Constructive interference occurs for the entire wave front forming a central bright band. Moving up and down from A, more and more pairs arrive out of the phase and so the brightness diminishes (for the bright bands.)Between the bright bands all the pairs of wave-lets arrive out of phase and dark bands are formed. A graph showing intensity variation with distance from the centre of the fringe system is as below:



06marks

(c) (i) $d = \frac{1}{N} = \frac{1}{650} = 1.54 \times 10^{-3}$mm $= 1.54 \times 10^{-6}$m

now $\frac{d}{\gamma} = \frac{1.54 \times 10^{-6}}{N600 \times 10-9} = 2.57$

∴ The highest or der is 2.

⇒The total number of image is 5 .

03*marks*

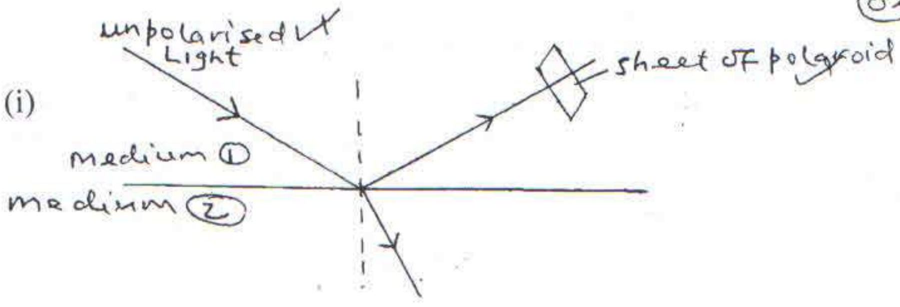
(ii) $\text{Sin}\theta = \frac{nx}{d}$

$= \frac{2 \times 600 \times 10^{-9}}{1.54 \times 10^{-6}}$

$\theta = 51.2^0$ 02marks

(02)

(d) (i)



Unpolarized light is made incident on a transparent medium. The reflected light is viewed through a sheet of polaroid while turning the sheet about an axis perpendicular to its plane. The procedure is repeated for other angles of incidence.

At a particular angle of incidence, the reflected light is received only at a particular orientation of the polaroid. The reflected light therefore is completely plane polarized.

03marks

(ii)
- Stress analysis
- Determination of the concentration of sugar in solution.
- Liquid crystal displays (LCD'S) 02marks

(e)

Prism	Diffraction grating
Produces single spectrum at a time.	Produces many spectrum at a time.
Shorter wave lengths are deviated most.	Longer wave lengths are deviated most.
Produces less pure spectrum.	Produces more pure spectrum.

03marks

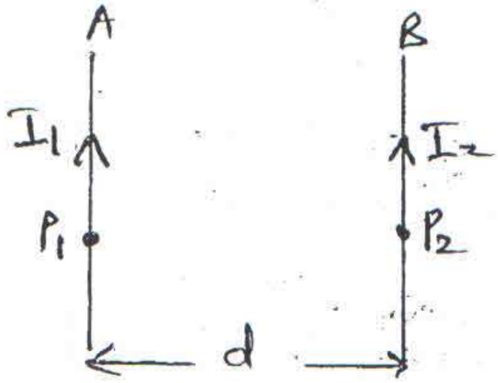
TOTAL = 20MARKS

5. (a) (i) A tesla is the magnetic flux density if a conductor of length 1m, carrying current of 1A placed perpendicular to the field experiences a force of 1N.

01mark

(ii) Magnetic flux is the product of the magnitude of the magnetic flux density and the area perpendicular to the magnetic field. 01mark

(b)



Consider two parallel conductors A and B above, carrying currents I_1 and I_2 respectively.

The magnetic flux density due to current I_1 at P_2 is

$$B_1 = \frac{\mu o I_1}{2\pi d}$$

The force acting per metre length on wire B

$$F_1 = B_1 I_2 = \frac{\mu o I_1 I_2}{2\pi d}$$

Similarly, the magnetic flux density due to current I_2 at P_1 is $B_2 = \frac{\mu O I_2}{2\pi d}$

The force acting per metre length on wire A

$F_2 = B_2 I_1 \quad = \frac{\mu O I_2 I_1}{2\pi d}$

∴ Force per metre length between A and B

$F = F_1 = F_2 \quad = \frac{\mu o I_1 I_2}{2\pi d}$

05marks

(c) (i) $B = \frac{\mu o I N}{2r}$

01mark

(ii) number of turns of the coil

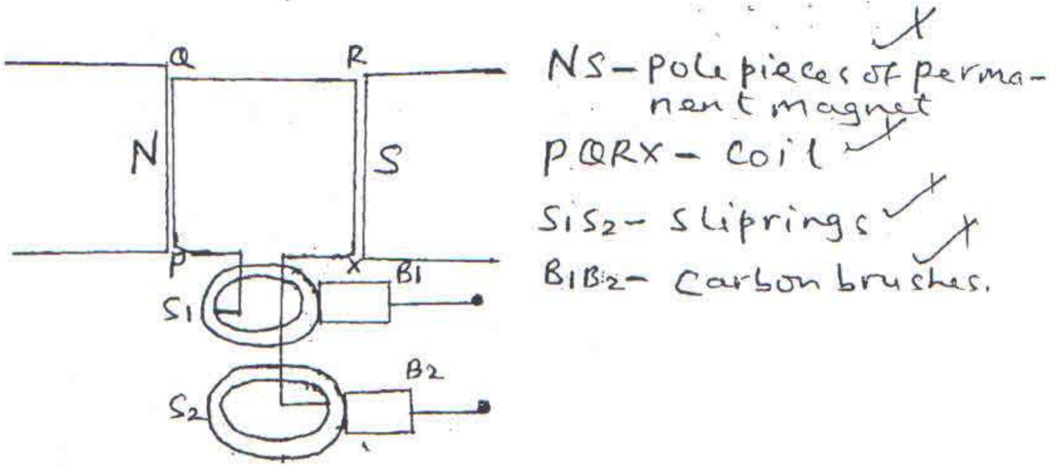
$N = \frac{8.0}{2\pi r} \quad = \frac{8.0}{2\pi X 0.06}$

Magnetic flux density at the centre of the coil.

$B = \frac{\mu o I N}{2r} = \frac{4.0\pi \times 10^{-7} x 3 x 8.0}{2 x\, 0.06 \times 2\pi \times 0.06} = \underline{6.67 \times 10^{-4}\ T}$

04marks

(d) (i)



The coil is rotated with uniform angular speed. An emf is induced in the coil which is led away through the slip rings S_1 and S_2.

When side PQ is moving upwards and RX down wards, by Fleming's right hand rule, the induced e.m.f is in direction PQRX.

The induced e.m.f $E = E_0 \sin wt$ which is zero when the coil is vertical and maximum when the coil is horizontal. When PQ is upper most and is beginning to move downwards the induced emf is in direction XRQP.
Hence current has reversed.

06 marks

(ii) The slip rings are replaced by split rings/comutators and the brushes Arranged so that the changeover of contacts occur after each half of The cycle.

02marks

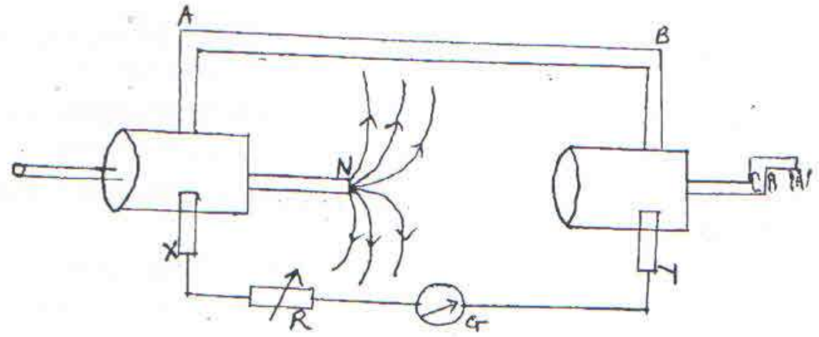
TOTAL = 20MARKS

6. (a) (i) The magnitude of the e.m.f induced in a circuit is directly Proportional to the rate of charge of the magnetic flux linked with the circuit.

The direction of the induced e.m.f is such as to oppose the change causing it.

02marks

(ii)



AB is a metal flame which is free to rotate round the magnet. X and Y are metal contacts connecting the galvanometer G to the metal frame AB. The frame is rotated at a constant speed so that a shows a steady deflection θ.
The time for n revolutions is taken and the frequency, f calculated. The experiment is repeated and the frequencies, f are recorded in a table with the corresponding steady
Deflections, θ. A graph of θ against F is plotted and is a straight line through the origin. This shows that $\theta \propto f$. But $\theta \propto I \propto$ Emf,E and also $\frac{d\emptyset}{dt} \propto f$ Hence E $\propto \frac{d\emptyset}{dt}$ where $\frac{d\emptyset}{dt}$ is the rate of change of magnetic flux.

05 marks

(b) Self induction is a process in which e.m.f is induced in a circuit due to charging current in the same circuit.

Mutual induction is a process in which e.m.f is induced in a circuit due to Changing in a nearby circuit.

(c) (i) $\frac{N_S}{Np} = \frac{V_S}{Vp} \Rightarrow \frac{N_S}{3000} = \frac{12}{240}$

$$Ns = \frac{3000x12}{240} = 150$$

02 marks

(ii) $\eta = \frac{I_S\, V_S}{Ip\, Vp} \Rightarrow \frac{80}{100} = \frac{12Is}{240IP}$

But Is $= \frac{P_O}{V_S} = \frac{36}{12} = 3$A

$\Rightarrow \frac{80}{100} = \frac{12\ X\ 3}{240IP}$ IP $= \frac{100\ X\ 12\ X\ 3}{80\ X\ 240} = 0.19A$ 03 marks

(d) (i) When a motor coil rotates in the magnetic field, an e.m.f is induced in the coil. The induced e.m.f acts in opposition to the applied voltage and is thus called a back e.m.f. 02marks

(ii) Back e.m.f - provides the mechanical power for the motor to do Work.
- Limits the current flowing in the coils that would
- Otherwise burn out. 02 marks

(iii) Power supplied = power output + power lost

VI $= E_bI + I^2R$

Efficiency $= \frac{EbI}{VI} X100$

$= \frac{E_b}{v} x\ 100$ 02marks

where V and E_b are supply voltage and back e.m.f respectively.

7. (a) Peak value of an alternating current is the maximum value of the alternating Current.

Root mean square value is the value of the steady/direct current which dissipates heat in a given resistor at the same rate as the alternating current.

02marks

(b) (i) Compare V = 40 sin 120 $\pi\ t\ with\ V = v_o \sin 2\pi ft$

Then $120\pi = 2\pi f$

$f = \frac{120\pi}{2\pi} = 60hz$

(ii) $Io = \frac{V_o}{R} = \frac{40}{200} = 0.63A$

Average power $< p > = \frac{IoVo}{2} = \frac{V_0^2}{2R} = \frac{(40\pi)^2}{2X200} = 4\pi^2 = 39.5w$ 03marks

(c) (i) Let V = Vo sin wt

from Q = Cr

$I = \frac{dQ}{dt} = \frac{d}{dt}$ (cv)

Or $I = \frac{d}{dt}$(C Vo w cos wt)

= CVo w cos wt

= w cvo sin (wt + $\frac{\pi}{2}$)

$\Rightarrow$ Current leads voltage by $\frac{\pi}{2}$.

(ii) I = cwvo sin (wt + $\frac{\pi}{2}$)

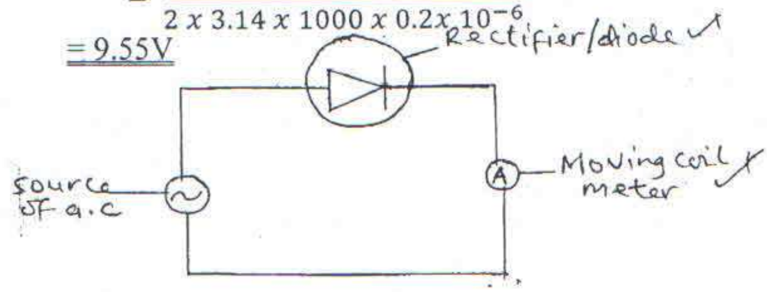
Io = cwvo

$xc = \frac{Vo}{Io} = \frac{1}{WC} = \frac{1}{2\pi Ffc}$ 02 marks

(iii) $XC = \frac{1}{2\pi fc} = \frac{1}{2 x 3.14 x 100 x 0.2 x 10^{-6}}$, voltage , v = I x c

$= \frac{12 x 10^{-3}}{2 x 3.14 x 1000 x 0.2x 10^{-6}}$

= 9.55V



Current to be measured is fed to the meter through the rectifier/diode which conducts current in only one direction. So a direct current of varying magnitude flows through the meter. The moving coil meter is calibrated to measure root mean square values of current.

04marks

(e) a.c voltages can be stepped up or down as required. When voltage is high, current is low and power dissipated in the transmission wire is small. d.c cannot be transformed so large current transmission results into loss of large amounts of energy.

02marks

TOTAL = 20 marks

SECTION D

8. (a) (i) All points on an equipotential surface have the same potential; therefore no current flows in it.

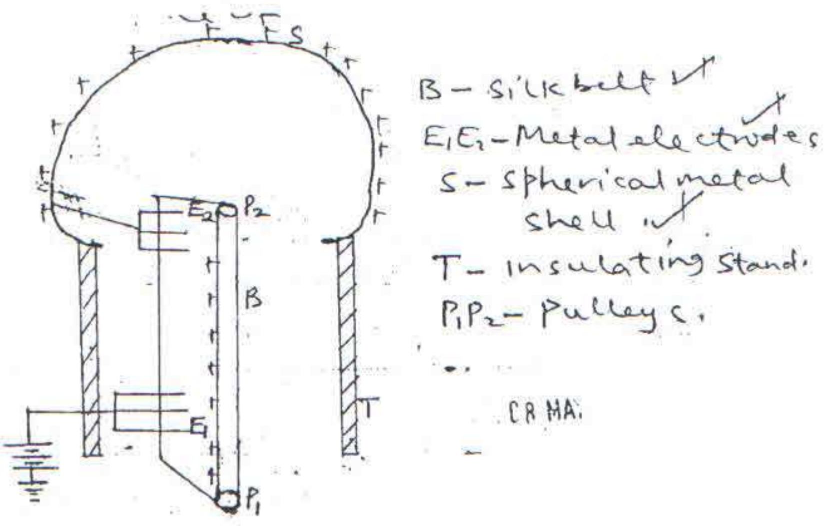
There is no electric field along any direction lying in the surface; or electric field lines are at right angles to the equipotential surfaces.

02marks

Work done in moving a charge from one point to another on the equipotential surface is zero.

(ii) Surface of a charged metal sphere. 01mark
The surface of the earth.

(b) (i)



The lower electrode is maintained at high positive potential relative to earth. The high electric field intensity at the spikes of the electrode ionizes air around the spikes. Positive ions are repelled onto the silk belt driven by the motor. The positive charge is carried up wards by the belt. As the charge approaches the upper electrode, it induces negative charge on the spikes of the electrode and repel positive charge onto the outer surface of the metal shell through the connecting rod. The high electric field intensity at the spikes of the electrode E_2 ionises air around it repelling negative ions onto the belt.

The negative charge neutralizes the positive charge on the belt before it goes over the upper pulley. This process is repeated until the metal shell is about 10^6V positive relative to the earth.

06marks

(ii) Insulating properties of the air around the generator – it determines the break – down voltage of the surrounding atmosphere.

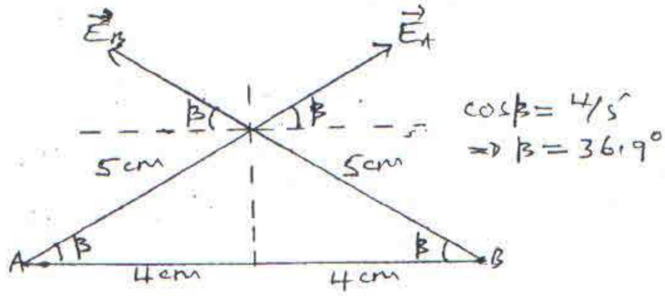
The potential of the lower electrode
It determines the amount of positive charge induced on the belt.

The speed of the motor that runs the belt. 03marks

(c) When two dissimilar insulator are rubbed together, heat is generated due to friction. This heat is sufficient to make the material of lower work function to release some electrons which are taken up by the other material. The one which loses electrons becomes positively charged while the one which gains electrons becomes negatively charged.

03marks

d)



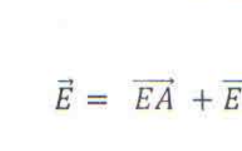
$$E_A = \frac{KQA}{r^2} = \frac{9 \times 10^9 \times 0.1 \times 10^{-6}}{(5 \times 10^{-2})^2} = 3.6 \times 10^5\ NC^{-1}$$

$$\text{Thus } \overrightarrow{EA} \begin{pmatrix} 3.6 \times 10^5 \cos\beta \\ 3.6 \times 10^5 \sin\beta \end{pmatrix} = \begin{pmatrix} 2.88 \times 10^5 \\ 2.16 \times 10^5 \end{pmatrix} NC^{-1}$$

$$E\beta = \frac{KQ\beta}{r^2} = \frac{9 \times 10^9 \times 0.05 \times 10^{-6}}{(5 \times 10^{-2})^2} = 1.8 \times 10^5\ NC^{-1}$$

$$\text{Thus } \overrightarrow{E\beta} \begin{pmatrix} -1.8 \times 10^5 \cos\beta \\ 1.8 \times 10^5 \sin\beta \end{pmatrix} = \begin{pmatrix} -1.44 \times 10^5 \\ 1.08 \times 10^5 \end{pmatrix} NC^{-1}$$

$$\vec{E} = \overrightarrow{EA} + \overrightarrow{EB} = \begin{pmatrix} 1.44 \times 10^5 \\ 3.24 \times 10^5 \end{pmatrix} NC^{-1}$$



$$E = \sqrt{(1.44)^2 + (3.24)^2} \times 10^5 = 3.55 \times 10^5\ NC^{-1}$$

$$\tan\gamma = \frac{Ey}{Ex} = \frac{3.24}{1.44} = 2.25$$

05marks

TOTAL = 20 MARKS

9. (a) (i) Capacitance of a capacitor is the ratio of the magnitude of charge on either plates of the capacitor to the potential difference between the Plates.

(ii) Suppose the p.d between the plates at some instant was V_1 when a Small charge of δq is transferred from the negative plate to the Positive plate, the p.d increases by δV.

The work done to transfer the charge

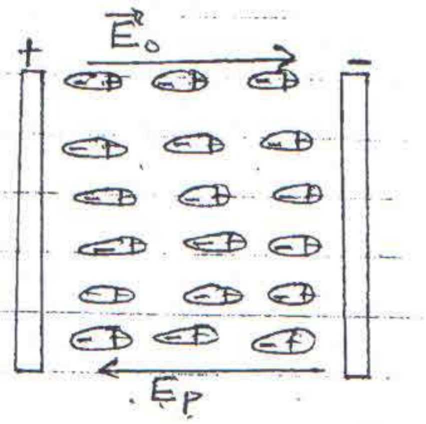
$8 W = (V + \delta V)\ \delta q$

$\cong V \delta q$

but $V = \frac{q}{c}$ $\therefore$ $\delta w = \frac{q}{c}\ \delta q$

$\therefore$ Total work done to gharge the capacitor to Q is $W = \int_0^Q \frac{q}{c}\ dq = \frac{1}{2} CV^2$

(b) (i)



When a dielectric is placed between the plates of a charged capacitor, the nuclei of the molecules of the dielectric are urged in the direction of the field and the electrons in opposite direction. The molecules thus get polarized (distorted). The surfaces of the dielectric near the capacitor plates develop charges opposite to those on the adjacent plates while charges inside the dielectric cancel out.

Since the charge on the dielectric are not conductible, the electric field intensity develops between the surfaces of the dielectric in a direction opposite the applied field. The resultant electric field intensity is thus reduced,

but $E= \frac{V}{d}$ hence the p.d between the plates, V is reduced. From $C = \frac{Q}{V_1}$, a reduction in V leads to increase in C.

04 marks

(c) $V = 300V$, $C = 400JK^{-1}$, $\theta = 0.6K$

Energy stored = $\frac{1}{2} CV^2$

Heat dissipated in the coil = $C\theta$

$\Rightarrow \frac{1}{2} C \times (300)^2 = 400 \times 0.6$

$C = \frac{400 \times 0.6 \times 2}{300 \times 300}$

$= 5.33 \times 10^{-3}F$

(d) capacitance $c = \Sigma\frac{A}{d}$, when d is increased c, reduces.

Also $V= \frac{Q}{c}$ where Q is the charge and since charge remains constant V Increases when C reduces.

04 marks

TOTAL = 20 MARKS

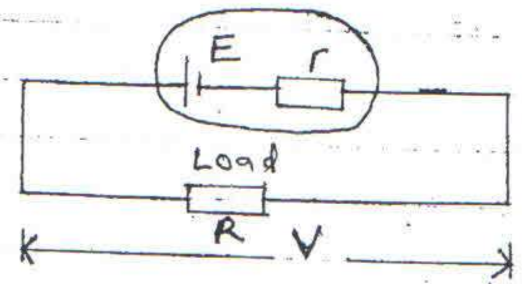
9. (b) (ii) In the conductor, there are electrons which move randomly with in the Conductor.

On placing the conductor in between the plates of the capacitor, the electrons are urged to move in the direction opposite to that of the field set up in the capacitor, and thus causes charge to directly flow from one plate to the other, so no charge is stored.

(iii) Keeps the plates of a capacitor apart.
Increases the capacitance of a capacitor
Reduces the chances of electric break down so that large p.d. scam be with stood.

10. (a) (i) Electromotive force of a battery is the energy supplied by the battery to transfer 1 C of charge around a complete circuit in which the battery is connected.

(ii)



Power delivered to the load, P_{out} = IV
Power supplied by the battery, P_{input} = IE

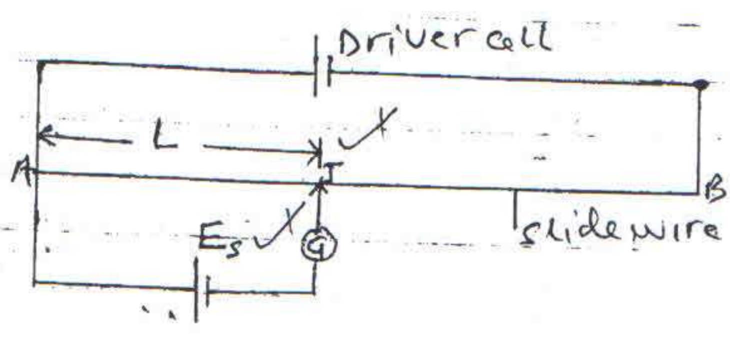
$$\text{efficiency } \eta = \frac{P_{out}}{P_{input}} \times 100$$
$$= \frac{IV}{IE} \times 100$$
$$= \frac{V}{E} \times 100$$

But V= IR and E= I(R+r)

$$\therefore \eta = \frac{R}{R+r} \times 100$$

03 marks

(b)



The sliding contact is moved along the uniform wire AB until a point is found when the galvanometer, G shows no deflection. The balance length, L is measured.
At balance p.d across AJ = E.m.f E_s

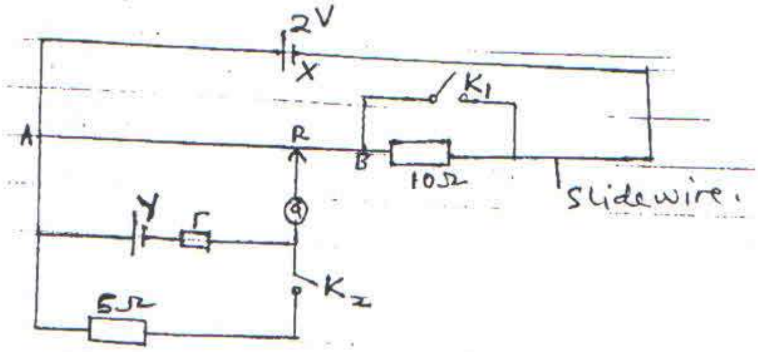
$E_s \quad = KL$

$\therefore K \quad = \frac{E_S}{L}$

Where K is the calibration constant

03 marks

c)



(i) $VAB = \left(\frac{50}{50+1}\right) \times 2 = \frac{100}{60} = \frac{10}{6}$

$p.d/cm = \frac{10}{6}/100 = \frac{1}{60}\ Vcm^{-1}$

E.m.f of cell, Y = p.d across 90cm of AB

$= \frac{1}{60} \times 90 = 1.5V$

(ii) When K2 is closed, p.d across 5Ω resistor = p.d across 75cm length
$= \frac{1}{60} \times 75$

$E = I\,(R + r) = 1.5$ .... ①

$V = IR = \frac{1}{60} \times 75$ .... ②

① ÷ ②

$\frac{R+r}{R} = \frac{1.5 \times 60}{75}$

$\frac{5+r}{5} = \frac{1.5 \times 60}{75} \Leftrightarrow 5 + r = \frac{1.5 \times 60 \times 5}{75} = 6$

$r = 6 - 5 = 1\Omega$

03 marks

(iii) When K_2 is closed, cell Y supplies current I through the circuit of 5Ω.
And internal resistance of 1Ω.
From $E = I\,(R + r) \Rightarrow 1.5 = 1\ 5 + 1) = 6\,I$

$I = \frac{1.5}{6} = 0.25A$

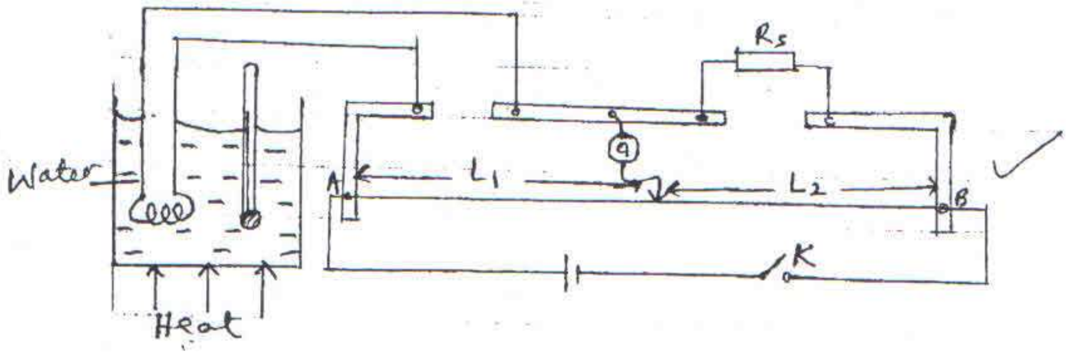
Let *l* be the balance length.

$5I = KL \Rightarrow 5 \times 0.25 = \frac{2}{100} \times L$

$$L = \frac{0.25 \times 5 \times 100}{2} = 62.5\text{cm}$$

03 marks

d)



The apparatus are set up as above. The specimen wire is made into a coil and immersed in a water bath. The ends of the coil are connected to the left hand gap of the metre bridge and a standard resistor R_s in the right hand gap. The water bath is heated to a suitable temperature, θ and after thorough stirring and switch, K is closed, the jockey is tapped at different points on a uniform wire AB until a point is found where the galvanometer shows no deflection.

The balance lengths $L_1$and L_2 are measured and recorded. The Procedure is repeated for different values of temperature, θ and the results are tabulated including values of $R_0 = \frac{L_1}{L_2}R5$.

A graph of Rθ against θ is plotted. Its slope, S is found. The Intercept R_0 on the Rθ axis is also noted. The mean temperature coefficient of resistance $\propto = \frac{S}{R_0}$

03 marks

TOTAL = 20 MARKS

END