ELDORET EAST INTER SCHOOLS EXAMS
FORM 4 PHYSICS 232/1
MAKING SCHEME PHYSICS

1. $V=V_2-V_1$

$V_{1 = Cross}$ section area x height

= 5cm x 5cm x 7cm

= 175cm3

V_1 $_{= cross\ section\ Area}$ x height

= 5cm x5cm x 10cm

= 250cm3

Volume of the pebble = Difference in volume

i.e. $V = V_2 - V_1$

= 250-175

=75cm3

2. (a) The smoke particles are seen to move a random Zig zag motion

(a) Increase in temperature brings about increase in vibration of the smoke particles

3. Volume = Area x Thickness

$6x15^{-19}$ = 0.0755xThickness

Thickness = $\frac{6x10^{-19}}{0.0755}$

= 7.947x10-18m

4. The weight of the bar acts at the centre

i.e. 0.5m

clockwise moments = Anticlockwise moments

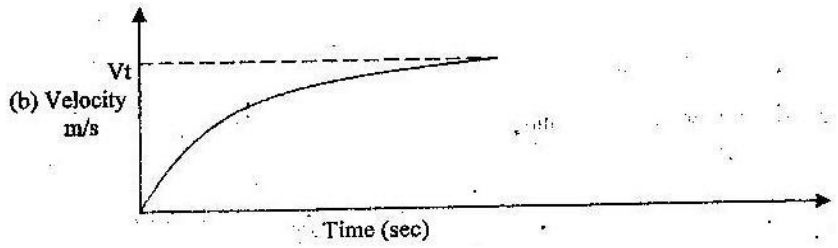
Xx = 0.1 x 1N

X = 0.01m or

X = 1cm

5. (a) Up thrust

- weight /gravitational force –mg
- viscous force (drag) F



Explanation when the ball enters into the liquid, mg >f+u and the resultant downward force therefore accelerates the ball downward. Viscous dig however increases with increase velocity until weight equals the upward force, this attaining velocity Vt.

6. Rate of flow = Volume / Time

= Area x Length / Time

= Cross – section Area x Speed

= Speed = Rate of flow / Cross –section Area

= 400cm3/s / Area

= Cross –Area = Tir2

= 22/7 x 1.4/2 x 1.4/2

= 1.54cm2

= Speed = 400cm3-1/s / 1.5cm

= 259.7cm/s

7. Ke = 1mv2 / 2 = Heat energy

= ½ x 0.8/100 x 100 x 400

= 6.4J

8. Ways of reducing stability
   - Reducing the base area
   - Raising the line through the C.O.G

9. Area of each part

   A = ½ X 4x25 = 50m

   B = 8x4 = 32m

   C = ½ x10x25 = 125m

   = 207m

10. total pressure = Atmospheric pressure +Pressure Due to the liquid

    = 1.03×10^5 + hpg

    = 1.03×10^5+10.15 x 800 x10

    = 1.03 x 10 +1200

= 103000
1200
104200
= 104200pa or 1.042×10^5 pa

11. to float the ballast tanks are emptied or to sink the ballast tanks are filled with ballast

12. mechanical advantage (M.A) $= \frac{\text{Load}}{\text{Effort}}$

$= \frac{480}{60}$

$= 8$

Efficiency $= \frac{\text{M.A} \times 100\%}{\text{V.R}}$

$80 = \frac{8 \times 100}{\text{V.R}}$

$\text{V.R} = \frac{800}{80}$

$= 10$

13. Adaptation of the vacuum flask
- Double walls
- Silvered walls
- Rubber cock
- Vacuum

14. Heat energy supplied = Power x time
= 300x260
= 36000J

Heat capacity $= \frac{\text{Heat energy}}{\text{Temperature change}}$

$= \frac{36000\text{J}}{\text{Q}}$

$1680 = \frac{36000}{1680}$

$= 21.4^0\text{c}$

15. (a) Work in the product force and preparation
Distance i.e. W = Fx d
S.I Units = Nm or Joules

(b) Work done = Force x distance
= 5000 x 4

= 20000J m

Rate of doing work
Time taken

(ii) Power = $\frac{20000}{8}$
= 2500Watts

9 (iii) Efficiency = $\frac{\text{Work output x 100\%}}{\text{Work input}}$

= $\frac{2500 \times 100}{2800}$
= 89%

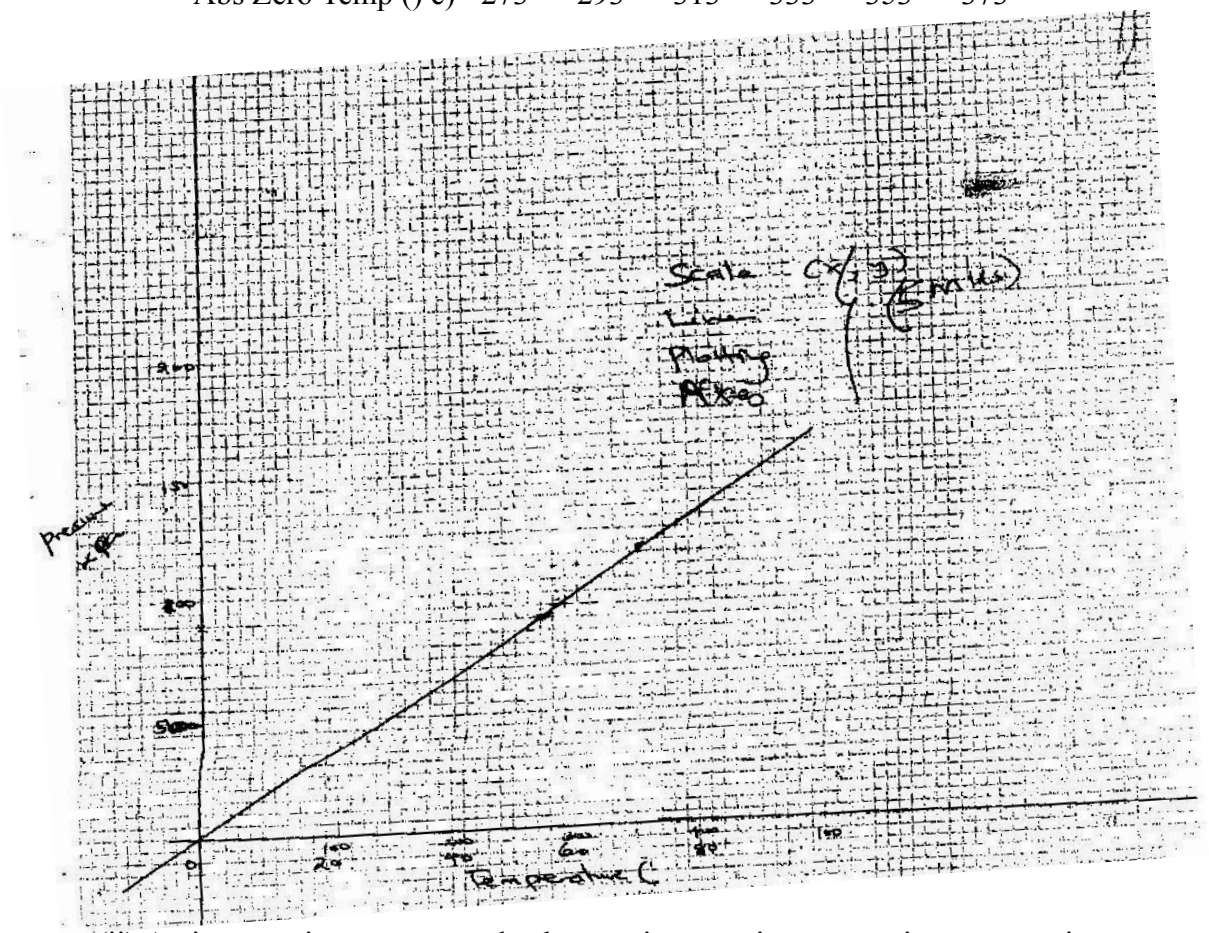
(i) Effects due to friction
Wear & tear

16. (a) Law of conservation of linear momentum states that a system of colliding bodies, total linear momentum remains constant providing no external forces act
(b) Initial momentum for A = Mass x velocity
= 2500 x 400m/s
= 100000kg/s
B = Mass x Velocity
= 3500 x 20
= 70000 kgm/s

(i) Momentum is concerved i.e momentum before collision is equal to momentum after collision
M1 V1 + M1V2 = (M1+M2)v
100000+70000 = (2500+3500)
= 6000
= 28.3M/S
(ii) The direction will be the direction of A
(iii) Newton's second law of motion states that the rate of change of momentum is directly proportional to the applied force and always place in the direction of the force.
17. (a) Absolute zero temperature in the lowest temperature a gas can fall to or it is the temperature at which the volume of a gas is assured to be zero.

(b)

Temp (Oc)	0	20	40	60	80	100
Abs Zero Temp () c)	273	293	313	333	353	373



(ii) An increase in temperature leads to an increase in pressure i.e. pressure is directly proportional to temperature

(c) PXT

P1/T1 = P2/T2

P1 = 300KPA P2 = 350KPA

T1 = 17+273 T2 = ??

$\frac{300000}{290} = \frac{350000}{T2}$

$T2 = \frac{350000 \times 290}{300000}$

= 338.3 – 273

= 65.3^0C.

(ii) Volume is held constant

18.(a) Archimede's principle state that when a body is partially or wholly in immersed in a fluid it experiences an up thrust equal weight of fluid displaced.

(b) i) Volume immersed in A is cross – Area x Lenth

Vol = 2cm2 x 1cm = 2cm3 = vol liquid displaced.

D = M m = DXV = mass liquid displaced

= 800 x 2 = 4 0.16kg x 10 = 1.6N

1000

Weight of = 1.6N

Liquid A displ.

ii) Weight liquid B displaced

Vol = 2cm2 x 1.5 = 3.0cm3

Mass = 1200 x 3 =0.36kg

3.6N

iii) Total mass = 0.36 + 0.16 = 0.52kg

$\frac{2.5}{4} - 0.52$

$= \frac{0.52 \times 4}{2.5} \quad \frac{0.52 \times 10}{25} = 8.832kg$

iv) $D = \frac{M}{V} = \frac{832}{8} = 104g/cm^3$

c) Upthrust = 3.8 – 2.8 = 1.0N

Relative density = $\frac{\text{Upthrust}}{\text{Weight}} = \frac{\text{Weightium}}{\text{Upthrust}}$

$= \frac{3.8}{1.0}$

= 3.8

(d) Special fatures of an hydrometer wide bulb.

Calibrated stem and narrow stem.

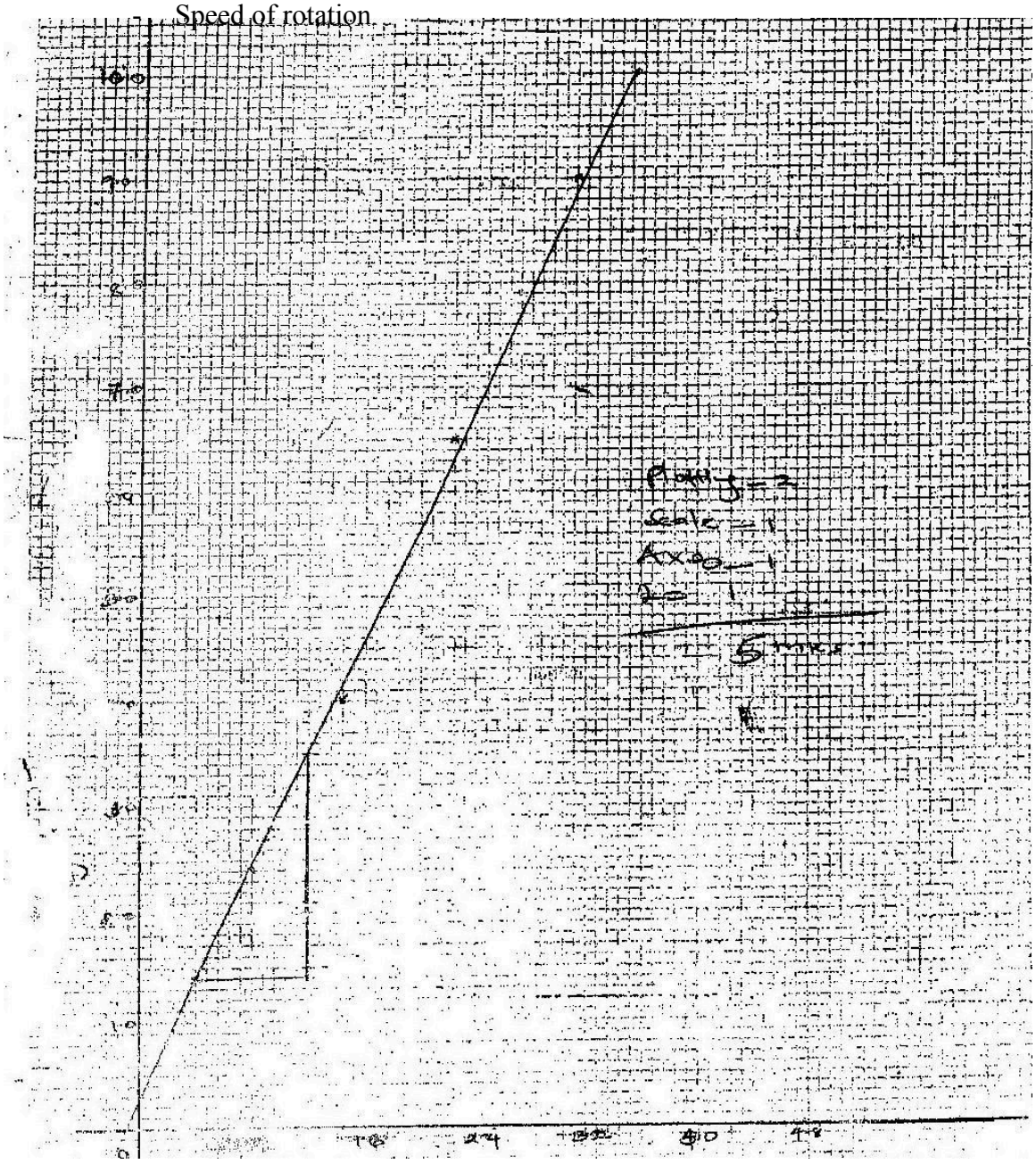
19. (a) Centripetal force in the force required to keep the body in a circular path.
Centrifugal force in the force acting away from the centre of satellite.

(ii) Slope $\Delta y/\Delta x = 3.5 - 1.4/1.2 - 0.$
$= 2.1/0.8$
$= 2.625$

(iii) $F = MV^2$
Where $m/r = 2.625$
$R = m/2.625$
$10.0/2.625 = 3.8m$

c) Factors affecting centripetal force

- Mass of object in circular motion.
- Radius of rotation
- Speed of rotation

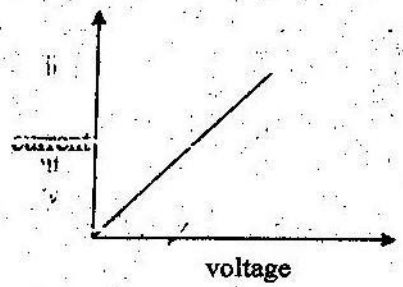


FORM 4 PHYSICS 232/2
MAKING SCHEME

(b) $\lambda_1 = [1 + 2e]$

$$F_1 = \frac{V}{\lambda_1} = \frac{V}{1+2e}$$

8.



$= 340M - Wavelength$

$$f = \frac{V}{x} = \frac{340}{340} = 1Hz$$

4. n1 sin Q1 = n2 Sin Q2

$$\frac{6}{3}\sin 30^0 = \frac{3}{2}\sin r$$

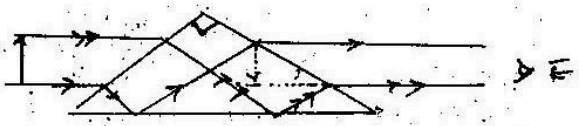
$$\sin r = \frac{2x6}{9}\sin 30$$

$$= 0.6667$$

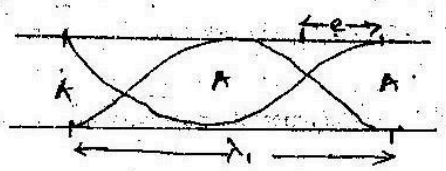
$$r = 41.8^0$$

5. $$I = \frac{v}{R} = \frac{20}{12} = 1.67A$$

6.



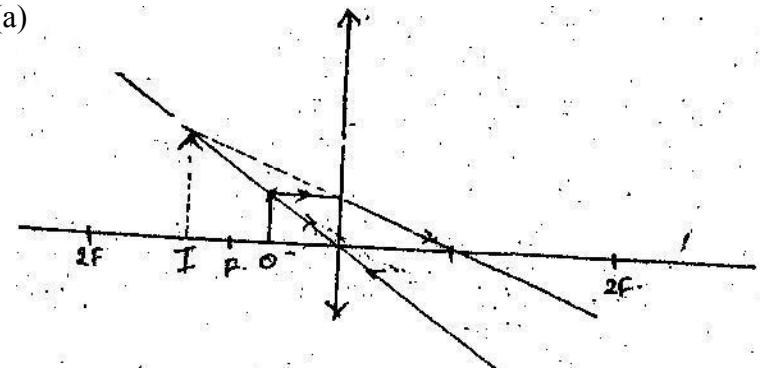
7. (a)



9. Gamma rays, ultra violet, infrared, radio waves
10. A – South pole (S)
    B – North pole (N)

11. (a) It is the chare stored per unit voltage
    (b) It is placed between the plates
    (c) It decreases the potential difference (P.d) between the plated leading to increased capacity as per equator
    =C=Q/V
    (d) i) The flame is blown to the right
    ii) Due to the high change concentration at the pointed andof the rod, air is ionized (Points action with positively charged ions being repelled away an electric blowiong the candle.
        i) The flame is split into two parts and the parts blown away from each other shown below.
        ii) The strong positive charge on the pointed end of the rod repels the positive ions in the flame away causing it to split.

12. (a)



(ii) As a maginifying glass

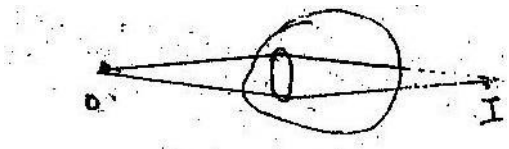
(iii)

Eye	Camera
- Crystalline convex lens	- Convex lens

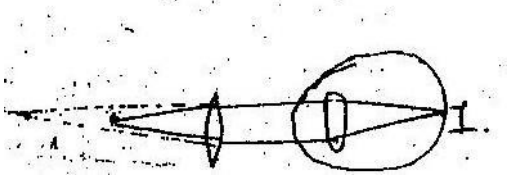
- Chloroids layer of eye is black
- Eye forms images on retina
- Ins control amount of light entering eye

- Camera box pointed black inside
- Images formed on light sensitive film
- Diaphragm control amount of light entering eye

(b) (i)



(ii)



1/V+1/U+1/F
1/V=1/F-1/U

(c) (i)

-1/20 – 1/10
-3/30
V = -20/2
6.667CM – Image is virtual

(ii) Image height = Image distance/object distance = 6.67/10x10.5=7.00cm
(iii) m = v/u = 6.67/10 = 0.667

13. (a) For the same current fluorescent tubes are brighter than filament bulbs OR – it consumes lower amount of energy due to lower resistance and cheaper.

(b) It has a low melting point
(c) Resistance
Amount of current

Time

(d) P =VI = 12.5x240

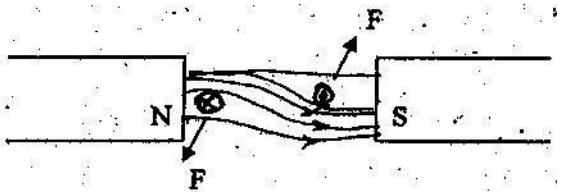
(e) State that magnitude of induced EMF is directly proportional to the rate of magnetic flux linking the conduction.

14 (a) total current

15 (a) Flemings left hand rule

If the thumb, first and second fingers of the left hand are held at right angles to each other then if the first finger represents the direction of the magnetic field and the second finger the direction of current thumb represent the directions of motion.

(b)



Pattern of field
Direction of field
Direction of force

(c) The diaphragm can be made to vibrate using sound input.
- As the coil attached to it vibrate cutting the magnetic fields of the magnet.
- Current is induced in it which can be amplified and directed to another loud speaker.

ELDORET INTER EAST EXAM
FORM 4 PHYSICS 232/3 - TERM 1 2010
MAKING SCHEME

1 (a) (i) I = 0.184A
V = 1.25V

(ii) $R = \frac{V}{I} = \frac{1.25}{0.18}$

$= 6.94\,\Omega \pm 0.2$

(iv) D = 0.32mm = 3.2. x 10^{-4}m

(b)

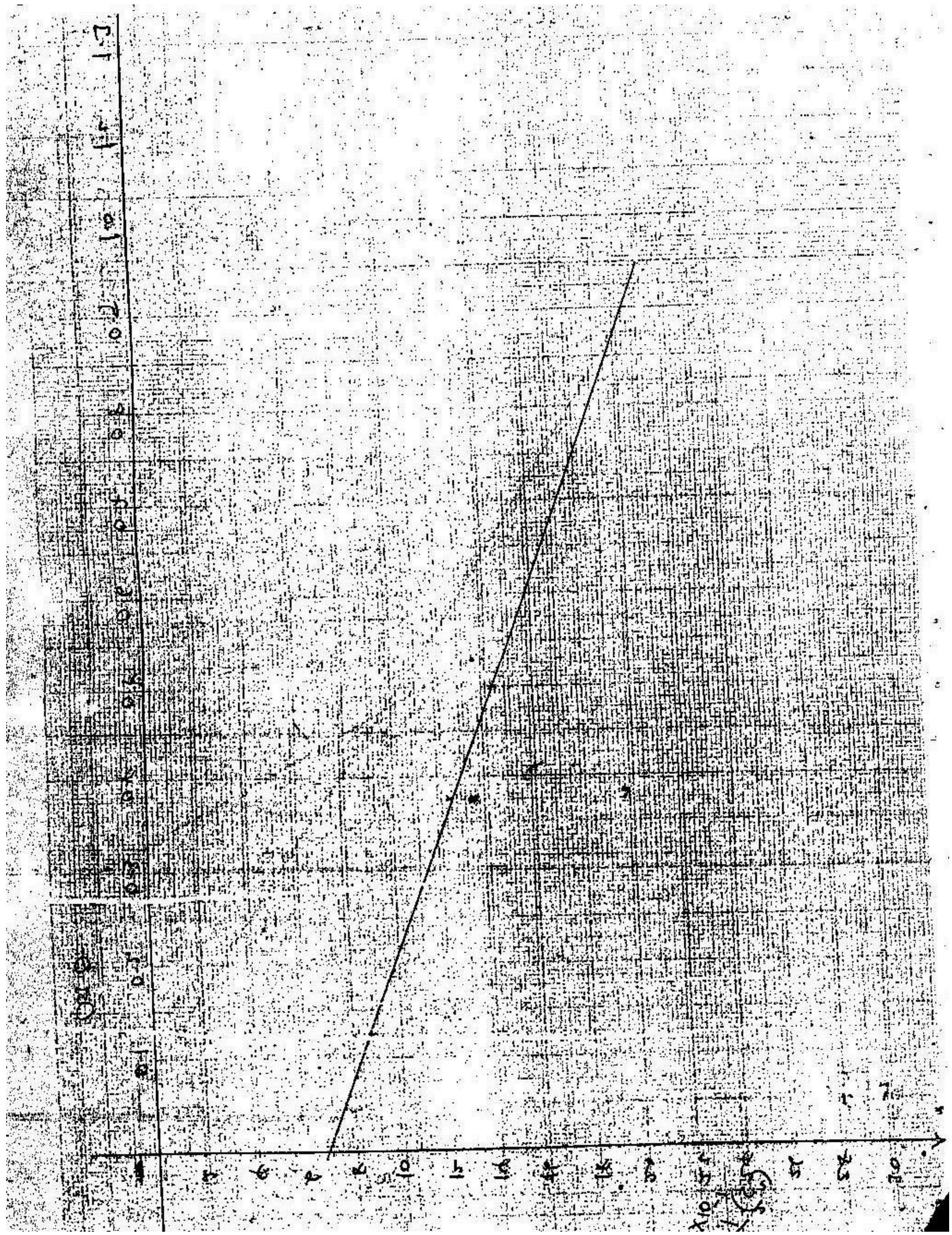
2θ	165	133	120	97	78	60	45
θ	82.5	66.5	60.0	48.5	39.0	30.0	22.5
Cos θ	0.1305	0.3987	0.5000	0.6626	0.7771	0.8660	0.9239
Time (t)	9.17	11.35	11.90	13.03	13.70	14.20	14.70
T (s)	0.917	1.135	1..190	1.303	1.370	1.420	1.470
$T^2(s^2)$	0.841	1.288	1.416	1.698	1.877	2.016	2.161

2θ = at least 5 correct values
Cos θ = at least 4 correct values
t = at least 5 correct values
T = at least 4 correct values
T^2 = at least 4 correct values

(c) (i) Graph
Labeling with units
Simple and uniform scale
Plotting
Line

(ii) Intercept 0.63S^2 ± 0.2

Gradient = $\frac{(28-16)\times10^{-1}}{1.35-0.6}\,S^2 = \frac{1.2}{0.75}$



2.

Ucm	Vcm	(U + v) cm
15	30	45
17	25	42
19	22	40
21	19	40
23	18	41
25	17	42
27	16	43
29	15	45

Graph axis : A1
Scale S1
Plotting
..... C

(f) Vm = 11cm
(u + v) m = 40 cm

(g) $\ell 1$ = 11cm
$\ell 2$ = 2cm
ℓ = 9cm

(h) 20cm