Physics Paper 3 (232/3) Answers

Question 1

PART A

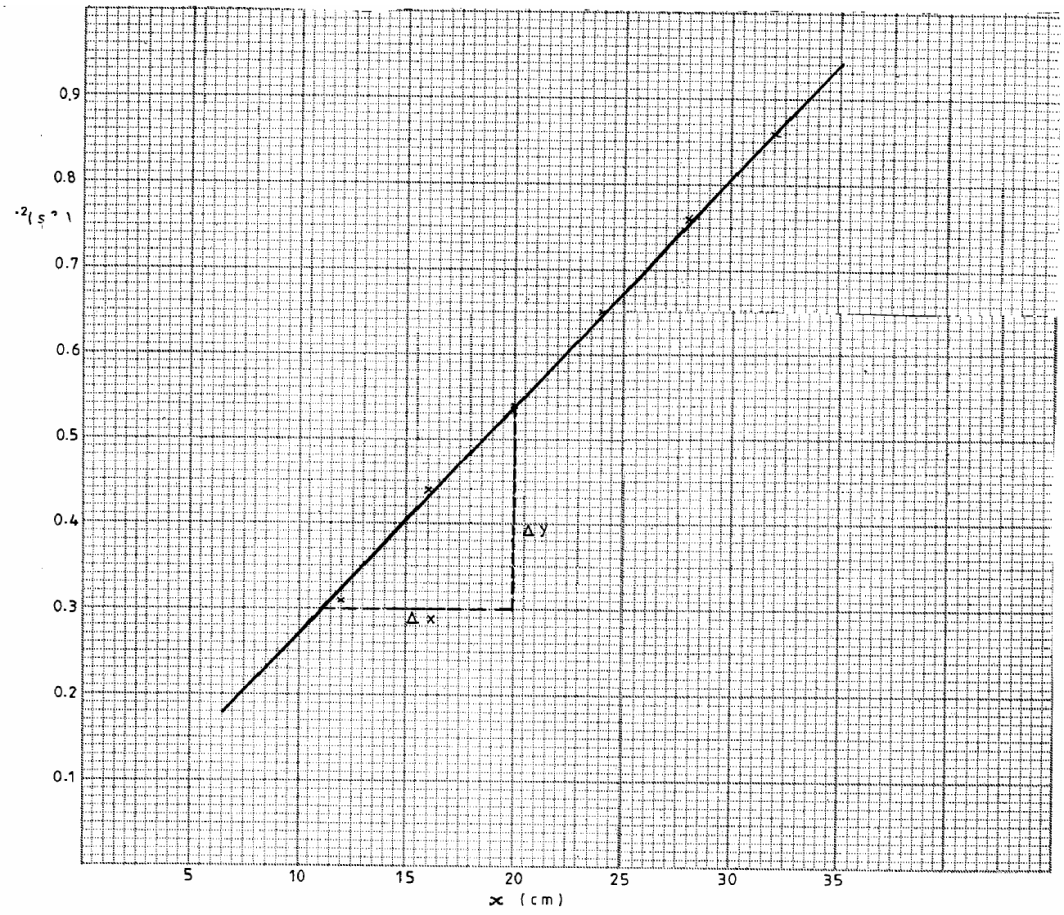
(c)

Length X (cm)	*32*	*28*	*24*	*20*	*16*	*12*
Time t for 20 oscillations	18.50	17.40	16.15	14.75	13.30	11.20
Period $T = \frac{t}{20}(s)$	0.925	0.870	0.808	0.738	0.665	0.560
$T^2(s^2)$	0.856	0.757	0.652	0.544	0.442	0.314

(5 marks)

(d)

(5 marks)



(e) (i) slope S = $\frac{0.54-0.30}{20-11}$

= $\frac{0.24}{9} = 0.0267\frac{s^2}{cm}$

(3 marks)

(ii) S = $\frac{8\pi}{3k}$

0.0267 = $\frac{8\pi}{3k}$

$\therefore$ k = $\frac{8\pi}{3\times 0.0267}$

= 313.767 cm/s^2. ***(2 marks)***

PART B

t(s)	$t_{1\,(s)}$	t_2 ***(s)***	t_3 ***(s)***	***Average t(s)***	$T=\frac{t}{5}(s)$
	3.46	3.25	3.44	3.34	0.67

(g)

(3 marks)

(h) P - $\frac{40L}{T^2}$ = $\frac{40\times 12}{0.67^2}$

= 1069 cm/s^2

= 10.7 m/s^2 (accept values between 9 and 11 m/s^2). ***(2 marks)***

Question 2

PART A

(a) $A=60^\circ$

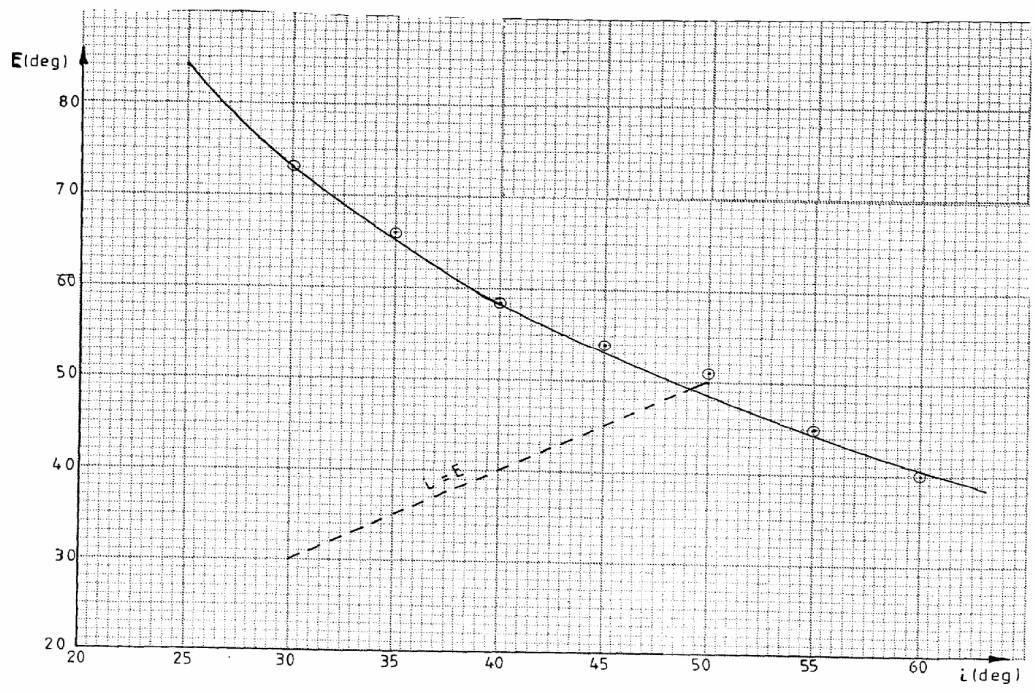
(1 mark)

(e)

Angle of incidence i (deg)	***30***	***35***	***40***	***45***	***50***	***55***	***60***
Angle Q (deg)	16.5	24.0	31.5	36.0	38.9	45.0	50.0
Angle of emergence E=90-Θ	73.5	66.0	58.5	54.0	51.1	45.0	40.0

(6 marks)

(f) (i)



(5 marks)

(ii) $i_o = 49°$ ***(1 mark)***

(iii) (I) y $= 2i_0 - R$
$= 2\,(49) - 60 = 38°$
(1 mark)

(II) k $= 2 \sin 49° = 1.51$
(1 mark)

PART B

(g) (i) V = 60 cm

(ii) $f = \frac{uv}{u+v} = \frac{(30)(60)}{90} = 20cm$

(2 marks)

(h) (i) d = 10 cm
(1 mark)

(ii) I $= \frac{df}{f-d} = \frac{10 \times 20}{10} = 20$

(1 mark)

II x $= \frac{L}{2f} + 1 = \frac{20}{40} + 1 = \frac{20}{40} + 1$
$= 1.5$

(1 mark)