

FORM FOUR TERM ONE EXAM 2017

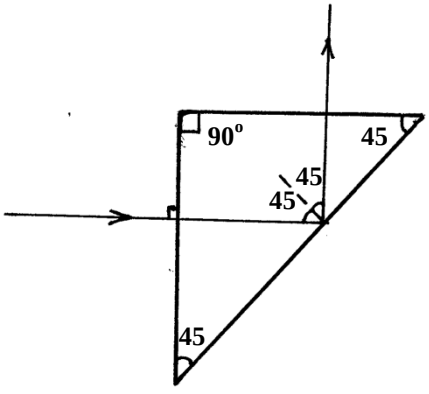
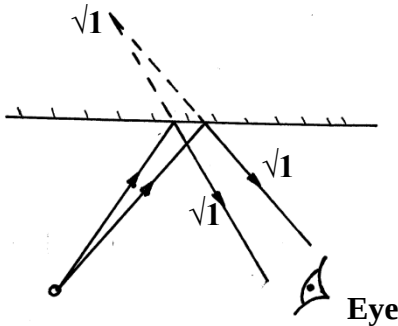
PHYSICS PAPER 2 MARKING SCHEME

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PHYSICS 2

MARKING SCHEME

No	Answers	Remarks
1	White paper is not smooth✓ therefore light reflected by the paper is to different directions (diffused reflection) therefore, no image seems to form ✓	$\frac{1}{2}$ $\frac{1}{2}$
2	(a) Y- Amplitude $\sqrt{a}$ (b) X-wavelength λ	1 1
3	Conditions necessary for sound production Vibrations or oscillations✓ Material medium ✓ Energy	Any two correct
4	X-carbon rod ✓ Y- act as a negative terminal (also involved in the reaction to produce the e.m.f and gets eaten away with time	1 1 1 1
5.	Suspend the magnet✓ freely, away from a magnetic material. The magnet rest facing north –south earth's magnetic field. The N-pole points in the earth's north pole (geographical)	Suspend freely 1 1
6.	Distance = 100+100=200m Time = $\frac{\text{distance}}{\text{speed}} = \frac{S}{V} = \frac{200m}{330m/s} = 0.6061s$	
7.	Let R be effect resistance $\frac{1}{R} = \frac{1}{8} + \frac{1}{7} = \frac{7+8}{56} = \frac{15}{56} \checkmark 1$ $\therefore R = 56/15 \checkmark 1 = 3.73\Omega \checkmark 1$	
8		Light at 90° to the prism
9.	A driver in front will see the word ambulance (AMBULANCE) due to lateral inversion of mirrors hence give way✓1	
10.		For the rays and where they meet

11	Glass (more dense) C-critical angle $\sqrt{1}$ 90° Air (less dense) $\sqrt{1}$ $i > c$														
12.	(a) <table><tr><td>Radio waves</td><td>Micro waves</td><td>Infra-red</td><td>visible</td><td>Ultra-violet</td><td>x-rays</td><td>Gamma rays</td></tr></table> $\sqrt{3}$ (a) Radio waves have the longest wave length$\sqrt{1}$ They less energetic and less penetrative (c) The ionosphere is able to reflect radio waves to the receive and good reception (d)$f = \frac{3 \times 10^8 \text{ m/s}}{1500 \text{ m}} = 200,000 \text{ m}$ $= 2 \times 10^5 \text{ m}$ For all in correct order Any one mark	Radio waves	Micro waves	Infra-red	visible	Ultra-violet	x-rays	Gamma rays							
Radio waves	Micro waves	Infra-red	visible	Ultra-violet	x-rays	Gamma rays									
13	(i) <table><tr><td>1/u</td><td>0.050</td><td>0.040</td><td>0.033</td><td>0.025</td><td>0.200</td><td>0.014</td></tr><tr><td>1/v</td><td>0.050</td><td>0.050</td><td>0.667</td><td>0.075</td><td>0.08</td><td>$0.086\sqrt{3}$</td></tr></table> (ii) Refer to graph A-1 S-1 P-2 L-2 (iii) The y-intercept is 10×10^{-2} $f = \frac{1}{\text{y-intercept}}$ or $\frac{1}{\text{x-intercept}}$ For 1 mark for getting the recipri 1 mark for ident inter	1/u	0.050	0.040	0.033	0.025	0.200	0.014	1/v	0.050	0.050	0.667	0.075	0.08	$0.086\sqrt{3}$
1/u	0.050	0.040	0.033	0.025	0.200	0.014									
1/v	0.050	0.050	0.667	0.075	0.08	$0.086\sqrt{3}$									
14															

$$\text{Refractive index} = \frac{\text{speed index}}{\text{speed in prism}} \sqrt{1}$$

$$= \frac{3 \times 10^8 \text{ m/s}}{1.88 \times 10^8 \text{ m/s}} \sqrt{1}$$

$$= 1.5958 \sqrt{1}$$

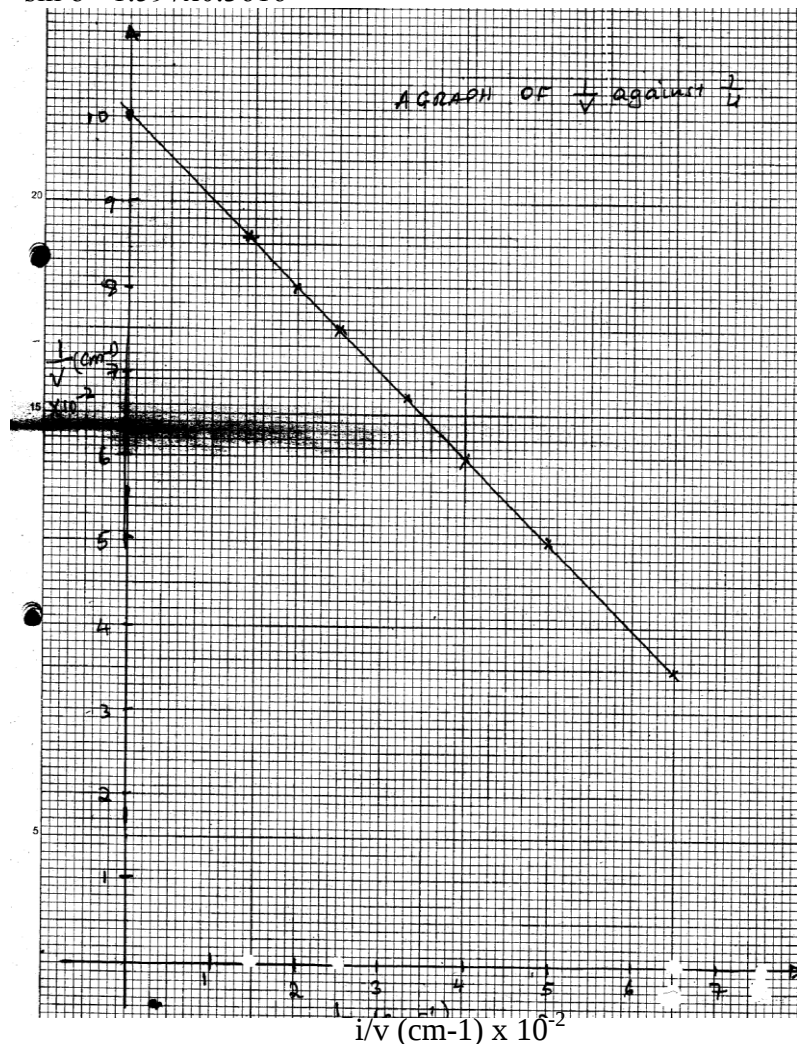
(b) As indicated on the diagram

$$n = \frac{1}{\sin C} = \sin C = 1/n = 1/1.5957 = 0.6266$$

$$= 38.8^\circ$$

$$(c) \text{ refractive index} = \frac{\sin i}{\sin r} = 1.595 = \frac{\sin \theta}{\sin 21.2}$$

$$= \sin \theta = 1.597 \times 0.3616$$



$$\sin \theta = 0.577$$

$$\theta = \sin^{-1} 0.577 = 35.2^\circ$$

(d) As indicated on the diagram

Follow the indication of diagram

15. Heat lost by the heater = heat gained by water

$$MC\Delta\theta = p.t$$

$$c = \frac{p.t}{m \times \Delta\theta} = \frac{90 \times 15 \times 60}{2 \times (30 - 10)}$$

$$= 81000 \text{ J}$$

$$20$$

$$= 4050 \text{ J kg}^{-1} \text{ K}^{-1}$$

$$(b) \text{ effective capacitance} = 3 \times 10^{-6} \text{ f} + 2 \times 10^{-6} \text{ f}$$

$$=5 \times 10^{-6} \text{ f}\sqrt{1}$$

$$Q=VC \Rightarrow V = Q/C = \frac{1 \times 10^{-4}}{5 \times 10^{-6}}$$

$$=20\text{V}$$

(c) largest wavelength when the frequency is lowest

$$C=\lambda f$$

$$\Lambda = c/f\sqrt{1} = \underline{330\text{m/s}}$$

$$30\text{Hz}$$

$$=11\text{m}\sqrt{1}$$

(d) (i) Initially the polythene rod and cloth have same amount of charge $\sqrt{1}$

-when rubbed polythene acquire some of the charge (negative) from cloth hence excess negative charge $\sqrt{1}$

The cloth remain with excess positive charge hence positively charged

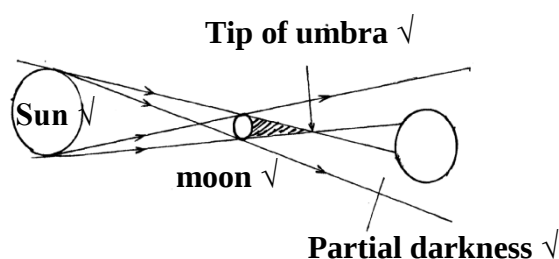
(ii) The brass is good conductor hence it quickly conduct the acquired charge through the hand which is also a good conductor of the charge hence it cannot be charged

Good conductor

Getting or discharges immediately

16.

(a)



1 rays

1 tip before earth

1 for correct positions

(b)

pinhole	Lens camera
(i) The image is always similar to the object	(i) Image can be distorted
(ii) It can be larger same size or smaller	(ii) is always smaller than the object

(c) $u=15\text{cm}$, $f=6\text{cm}$ $V=?$

$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v} = \frac{1}{6} = \frac{1}{15} + \frac{1}{v}\sqrt{1}$$

$$\frac{1}{6} - \frac{1}{15} = \frac{1}{v} \Rightarrow \frac{15-6}{90} = \frac{9}{90}$$

$$\therefore V = \frac{90}{9\sqrt{1}} = 10\text{cm}$$

(i) the image is 10cm from the concave mirror on the same side as object

$$\text{Magn} = \frac{\text{image distance}}{\text{Obj. dist}}$$

$$= \frac{10\text{cm}}{15\text{cm}\sqrt{1}}$$

$$=0.667\sqrt{1}$$

Image is real

Inverted

Same side as the object

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