**FORM 4 TERM 2**

**PHYSICS PAPER 2**

**Marking scheme**

SECTION A 1. n = 360/𝜃 - 1 √1S = 360  
𝜃 -1  
θ = 360  
6  
= 600√12. i. Polarization√1ii. Add a depolarizer/ an oxidizing agent√13. (i) Reciprocal of the focal length power of the lens

(ii) 1/f = gradient => f = 1/gradient

f= 13cm

iii v =u= 27cm

1. 4. Hammering makes the dipoles to vibrate√1Earth magnetic field aligns the dipoles√15. B- North pole√1A- South pole – Allow correct pole at one end  
   6. A1 will shows a reading while A2 will not show any reading. This is the fact that P will be forward biased hence conducting while Q is reverse biased hence it wil not conduct.

**7.** r =beta particle ✓, c=206 ✓ d= 82 ✓8. It forms a coating at the surface to prevent rusting and as an insulator  
It is less dense hence easy to carry  
It is easily available/cheaper (Any TWO √1 each)9. Distance between a particle in the wave medium and the next one that is in phase with it or Distance between two successive crest/trough √1  
10. V=2nd/t

= 400\*2/2.5

=320m/s

11. n=(2.2x108)/(2.0x108)

=1.1

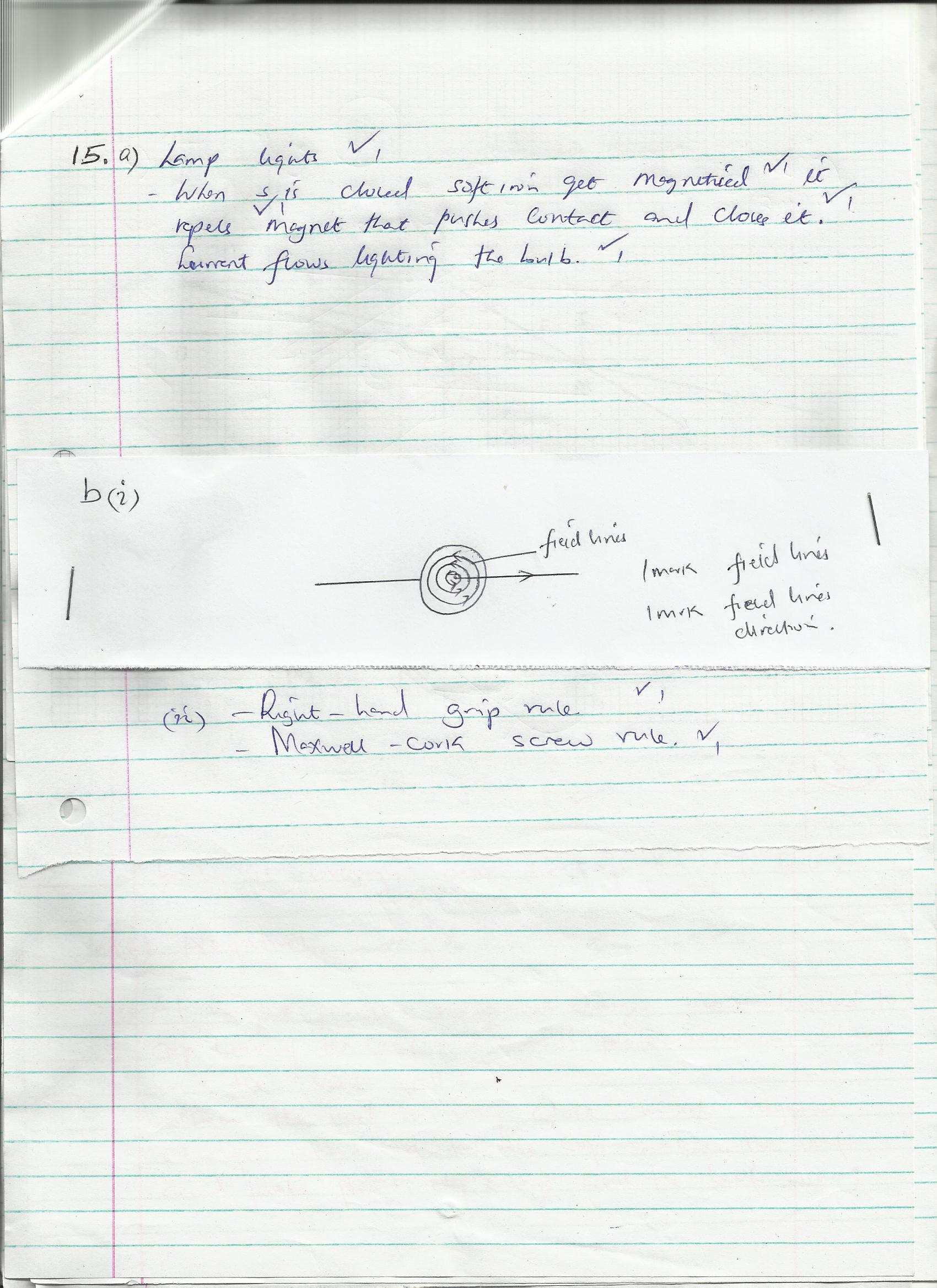
* 1. = sin i/sin 30

Sin I = 1.1 x sin30

=0.55

I = sin-1 0.55

12. (i)



(ii)

Right hand grip rule

Maxwell – cork screw rule

13. i) Wide view

ii) Gives upright image

14. ultra violet light

**15.** a) i) A – Grid✓1

B – Electron gun✓1

ii) C – Vertical deflection of beam of electrons✓1

D – Horizontal deflection of beam of electrons✓1

iii) By thermionic emission or heating the filament✓1

iv) To prevent ionization of electrons as they move to the anode✓1

b) i) E = ev✓1

E = 1.6 x 10-19 x 80000✓1

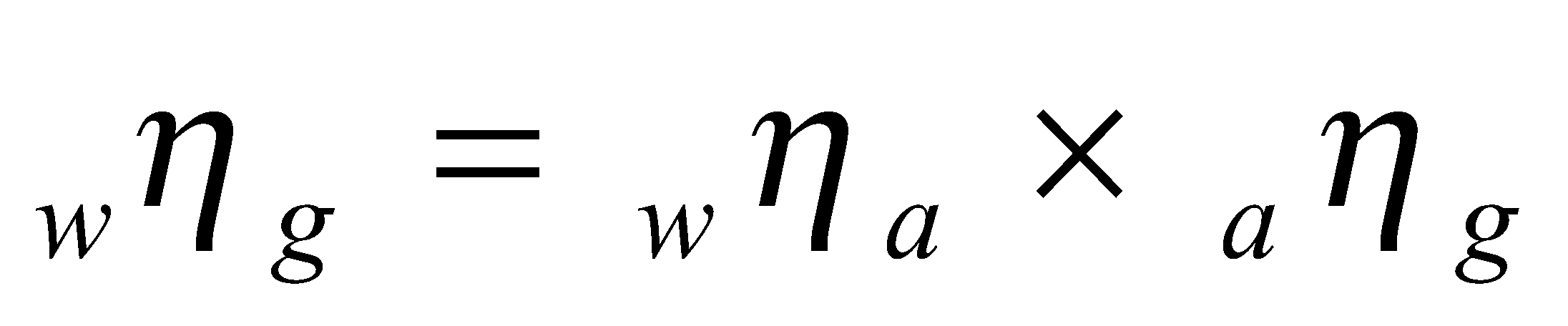
= 1.28 x 10-14 J✓1

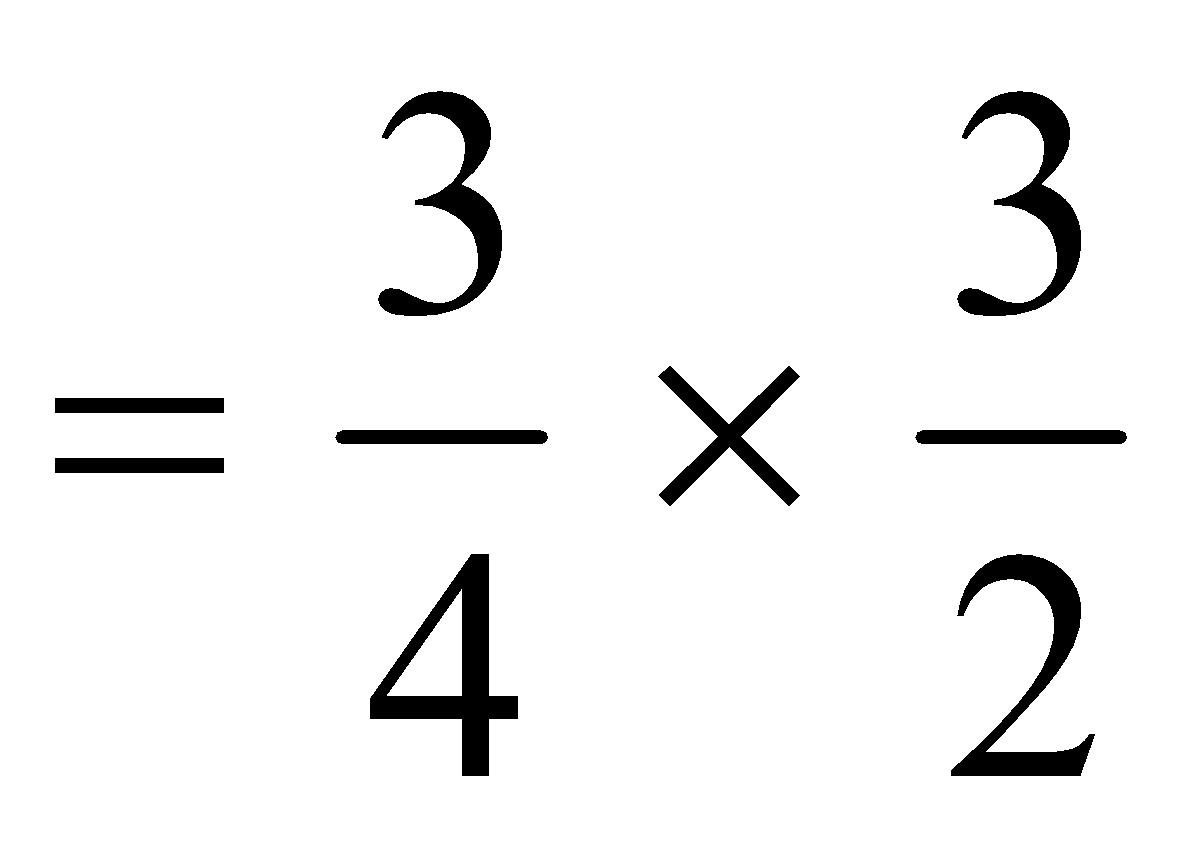
ii) ½ mv2 = 1.28 x 10-14✓1

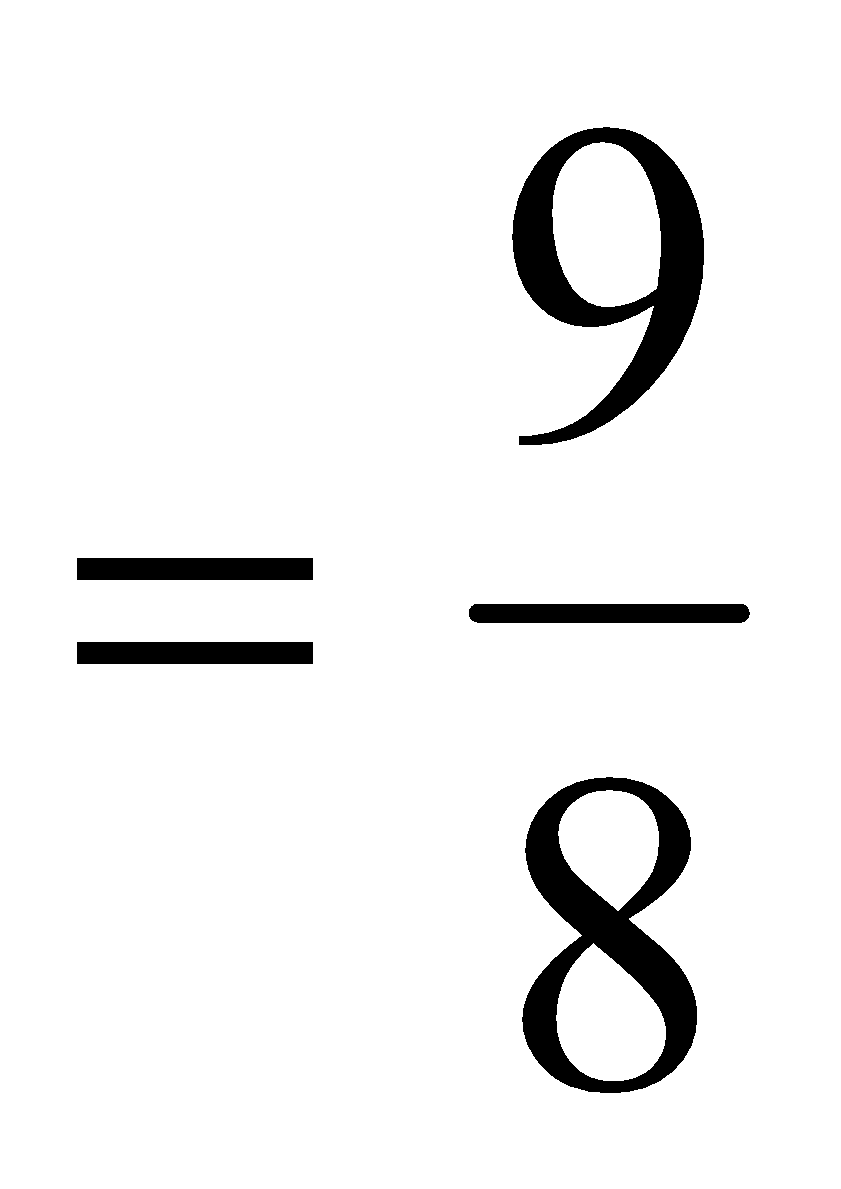
v2 =

v = ✓1

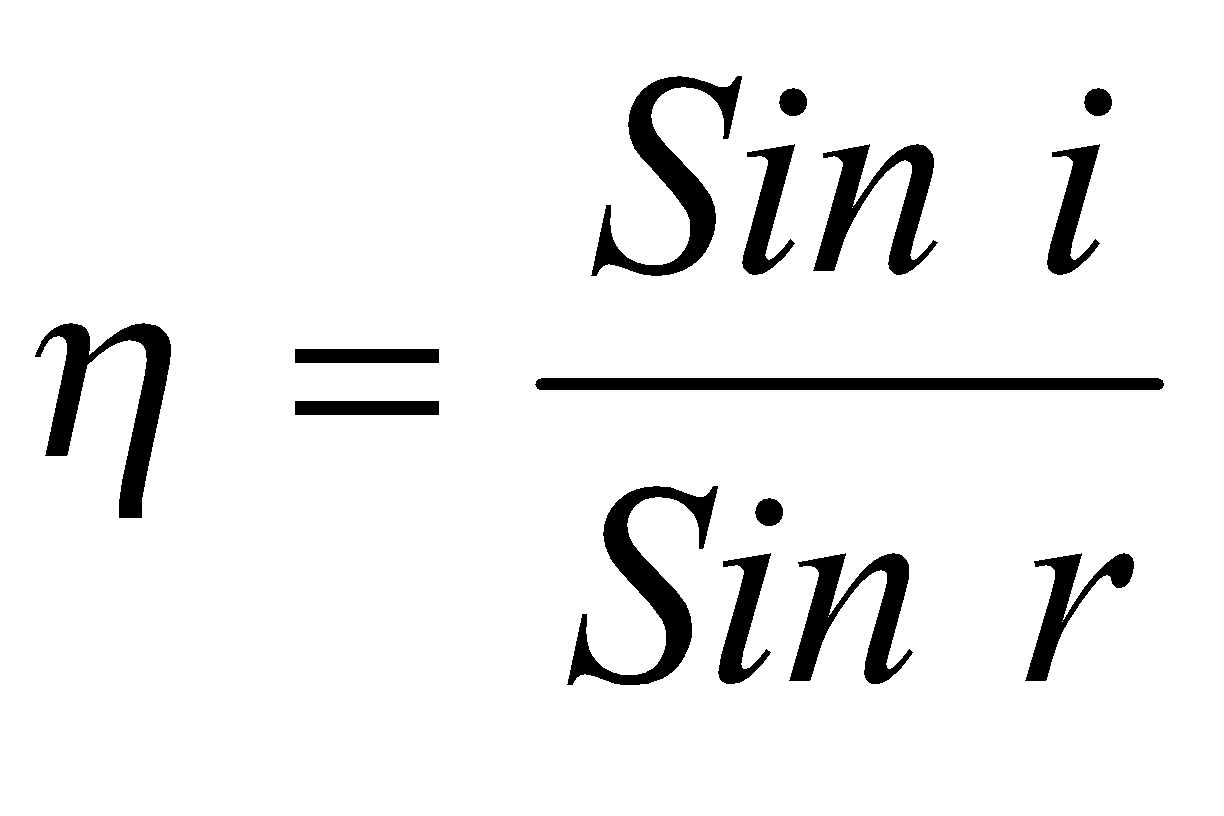
v = 2.23 x 108 ms✓1

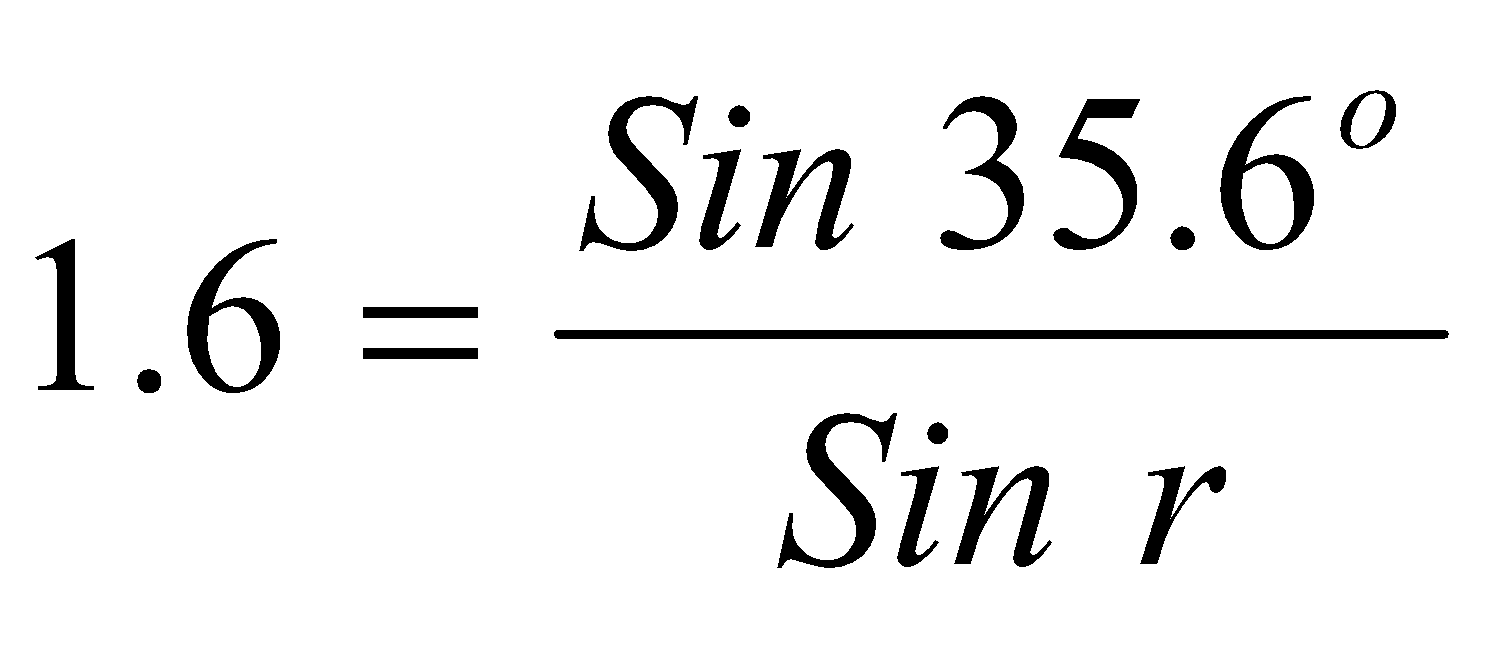
1. (a) 





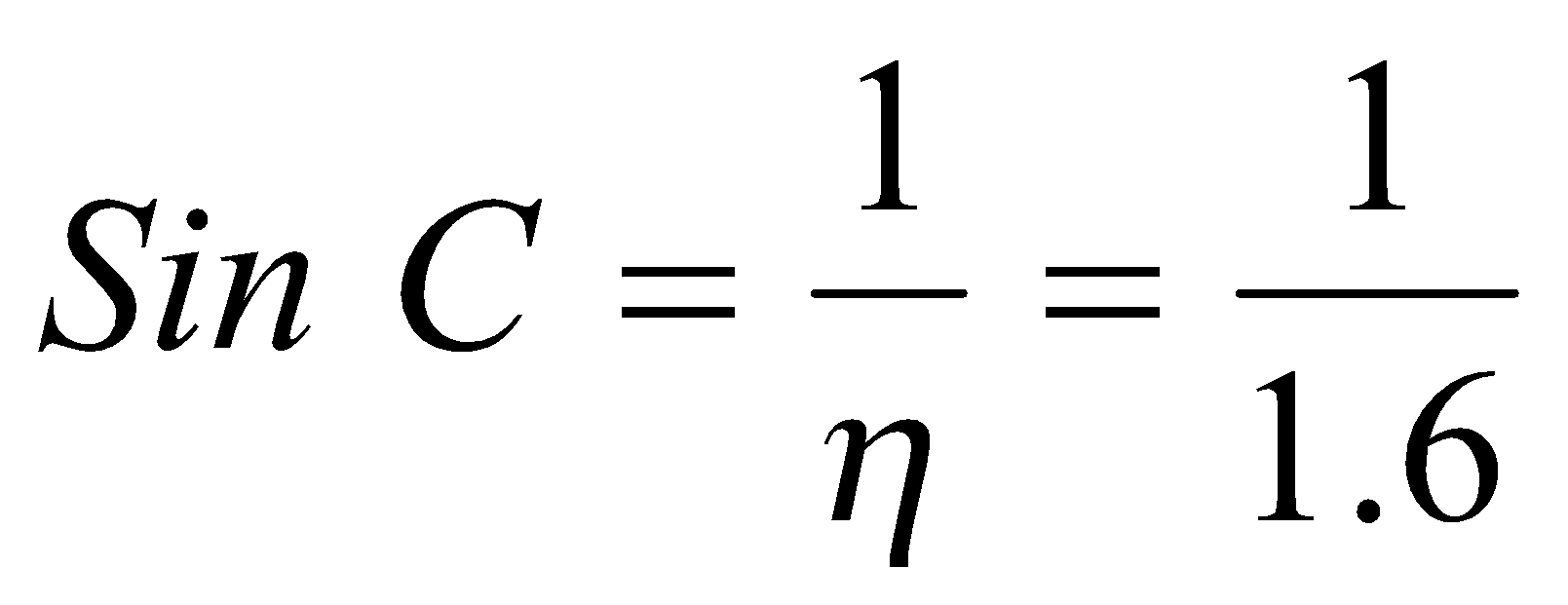
= 1.13

(b) (i) 

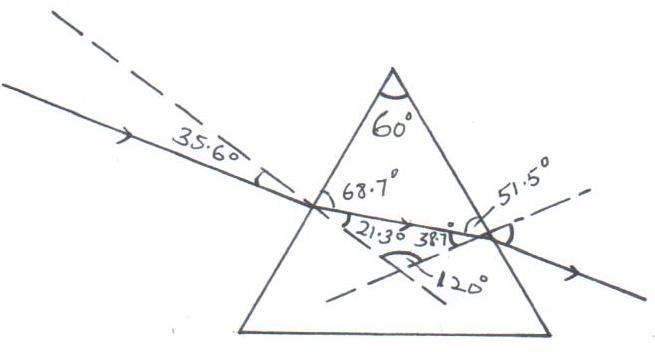


r = 21.3º

1. Angle of incidence = 38.7º (show working)



= 38.7º

(iii)

(iv) - The critical angle must be exceeded. ✓¹

- Light must be travelling from a dense medium to a less dense medium. ✓¹

1. a) Capacitors are used in

- rectification smoothing circuits

- tuning circuits

- camera flash

- reduction of sparking in induction coil contact

any one 1

  b) i) 2 x 8 = 16 = 1.6μF

2 + 8 10

1.6 + 3.2 = 4.8μF ✔

CT = 5 x 4.8 ✔ = 24 = 2.45 x 10-6F ✔

5 + 4.8 9.8

ii) Q = CV

= 2.45 x 10-6 x 12 = 2.94 x 10-5C ✔

charge on 3.2μF = 2/3 x 2.94 x 10-5

= 1.96 x 10-5C ✔

  iii) p.d on 5mF = Q = 2.94 x 10-5 = 5.88volts ✔

C 5 x 10-6

iv) energy = CV2 ✔

= ½ x 2 x 10-6 x 6.122

= 3.75 x 10-5J ✔

(c) (i) Capacitance will also increase

(ii) capacitance will decrease.

**Parallel circuit 1/30 + 1/20 = 5/60 or 60/50**

**R = 12 Ω**

**Total resistance = 10 + 12 = 22Ω (2 marks)**

(ii) l = V/R = 2.1/22 = 0.095A **(1 mark)**

(iii) Reading of the voltmeter

**V = lR = 10 x 2.1**

**22**  **= 0.95 (2 marks)**

1. a) Lenz’s Law states that the direction of induced current is such that it opposes the charge producing it.✔

b) i) When switch S is closed, the magnetic field strength increases (magnetic flux) from zero to maximum ✔1/2 This changing magnetic flux (field) induces an e.m.f

in the secondary coil ✔1When the switch is opened, the magnetic field strength decreases (magnetic flux) from maximum to zero ✔1/2 This produces an induced current in the secondary coil

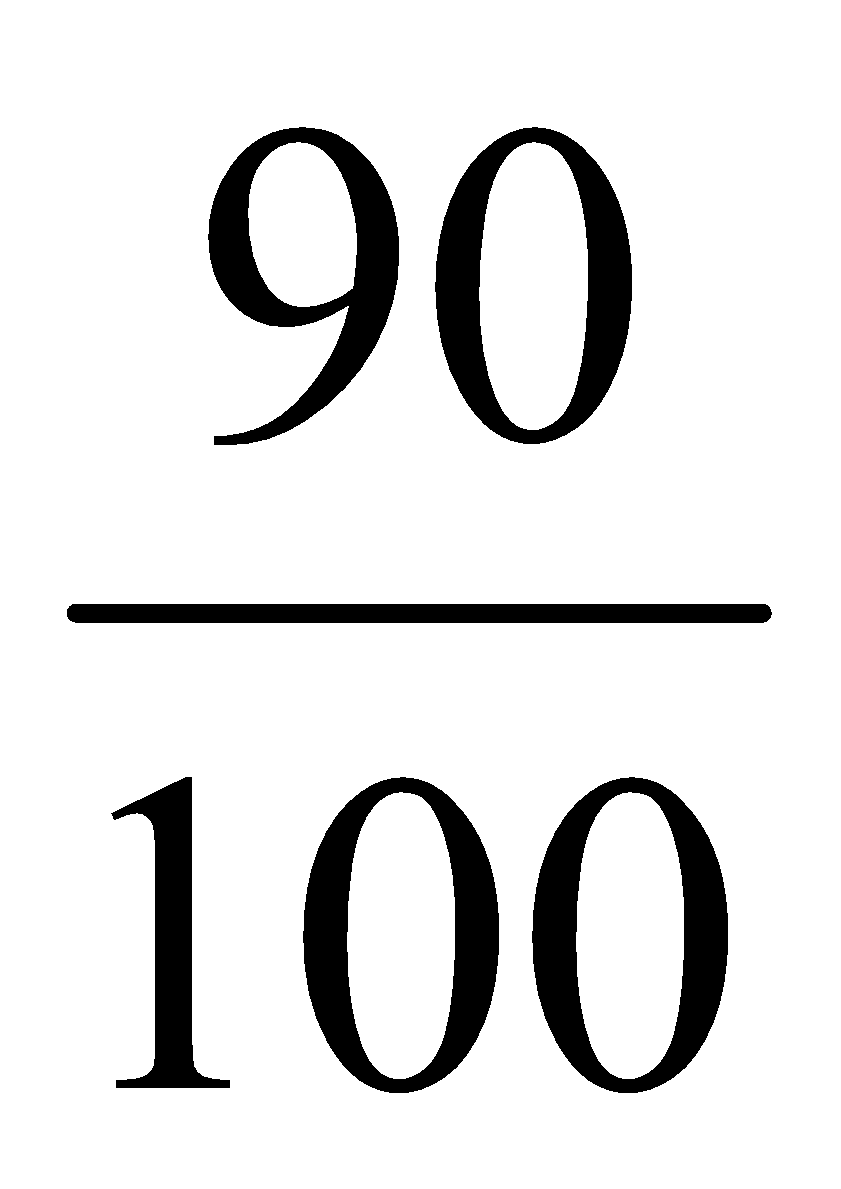
ii) Having more turns on the coil connected to the cell ✔

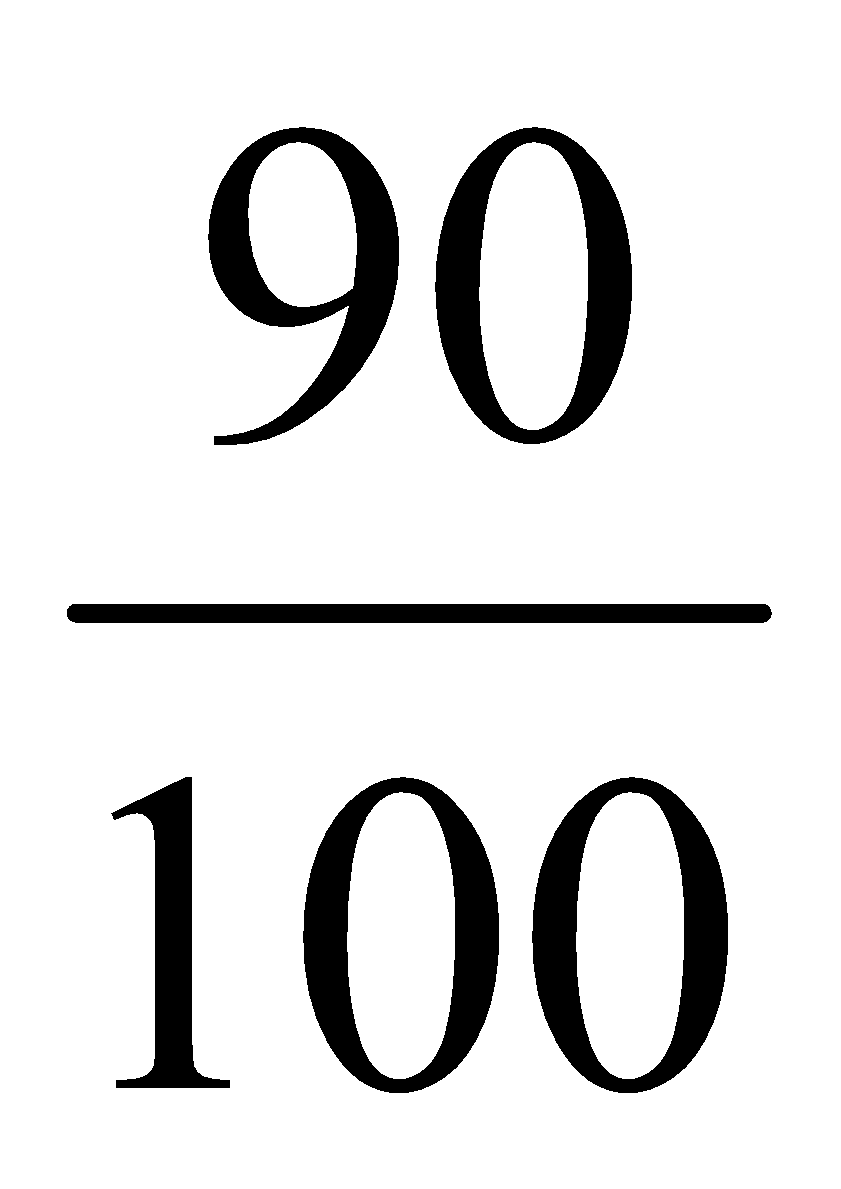
c) i) - Hysterisis

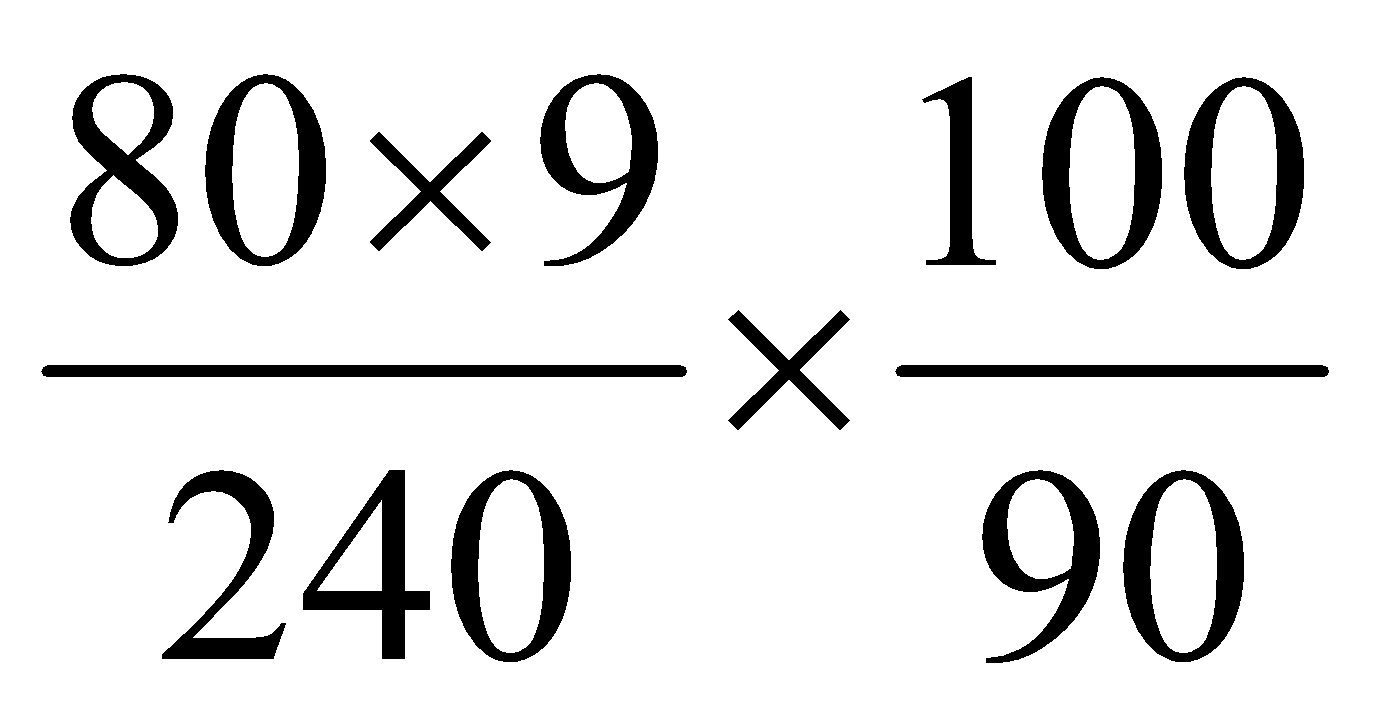
- Eddy currents

- Resistance of wire

- Loss of magnetic flux linkage

ii) Power Primary x = VsIs ✔1

240 x IP x = 80 x 9

IP = ✔1 = 3.33A ✔1

*18. (a) A – cathode B – Anode C – Cooling fins*

*(b) (i) increase the p.d at the anode (B)*

*(ii) : increase the cathode heater current*

*(c) Tungsten:- It has a high melting point so the heat produced will not melt it easily*

*(d) Copper – it is used to cool/conduct heat away from the anode*

*(e) So that the electrons do not collide with gas molecules which could result in loss of energy.*

f) E = QV = hf ✔

1.6 x 1019 x 1,200 = 6.63 x 1034 x f ✔

f = 2.9 x 1018 Hz ✔

*(g) (i)Detecting fracture in bones*

*(ii) Detecting flaws in metals*

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