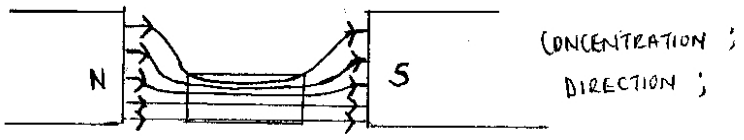
LANY ACHIEVERS PHYSICS PAPER2 232/2 MARKING SCHEME T2 2018

SECTION A

1. One which if a current is passed through it, voltage across its ends is not proportional to the current; (1mk)
2. Recliner property /light travels in a straight line; (1mk)
3. cooking;
   Communication; (2mks)
4. Angle of inclination to the field;
   - Length of conductor; (2mks)
5. 

6. (a) Minimizing energy lost due to collisions; (1mk)
   (b)

Hard	Soft
1. Highly penetrative /Energy	Low penetrative /Energy
2. Short wavelength	Long wavelength
3. High frequency	Low frequency
4. Produced at high voltage	produced at low voltage

   Any one x 3 = (3mks)

7. $P = \frac{V^2}{R}$; $R = \frac{V^2}{P}$ = $R = \frac{250x250}{3000}$ = 20.83 Ω ;

8. $138 - 90 = 48^0 = C$
   $n = \frac{I}{SinC}$;
   $n = \frac{I}{Sin48}$
   n = 1.346; (3mks)

9. $E = h\frac{C}{\lambda}$
   $\lambda = \frac{hc}{E}$; $= \frac{6.663x10^{-34}\,x3.0x10^{8}}{3.37x10^{-19}}$;
   $= 5.902 \times 10^{7}$m; (3mks)
10. Controlling the intensity of the beam/ Brightness; (1mk)
11. A: Manganese IV Oxide mixed with carbon;
    B: Ammonium chloride solution; (2mks)
12. Charges concentrated by point action;
    Similar charges from ionized gas repel while unlike charges attract; (2mks)
13. Dry cells uses solid electrolyte while wet cells uses solution of an electrolyte; (1mk)

SECTION B:

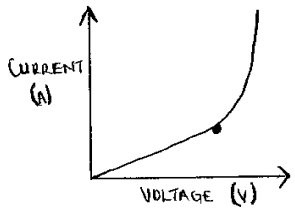
14. (a) i) To be easily ionized by the radiations. (1mk)
    (ii) The radiation are transparent to the window; They collide with argon gas causing ionization; more electrons are produced (Avalanche/electrons) . A pulse of current; is produced which is

passed through the counter as clicks; (4mks)

(iii) Quenching agent /absorbing kinetic energy of the positive ions; (1mk)
(iv) Use of amplifier; (1mk)
(v)

a = 226;
b = 88,

(b) In metals rise in temperature causes an increase in resistance while in semi conductors increase in temperature causes a decrease in resistance.;;
(ii)



15. (a) Forms a magnified image
(b) focus the image of the distant object on a screen until a sharp image is formed; Measure the distance between the mirror and the screen d; Repeat two or three times, find the average d which is the focal length.; (3mks)

(c)

(d) U + V = 120
u+ 5u = 120
6u = 120
u = 20;

$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

$\frac{1}{f} = \frac{1}{20} + \frac{1}{100}$;

$\frac{1}{f} = \frac{5+1}{100} = \frac{6}{100}$ $\quad f = \frac{100}{6} = 16.67$cm;

(3mks)

16. (a)

Causes	Method of minimising
Eddy currents	Laminations
Hysterises loss/Magnetic reversals	Use of soft iron
Heating effect. (T^2R)	Use of thick copper wires
Magnetic flux leakage	Winding secondary on primary/ use of soft iron core.

Any one, with correct method (2mks)

(b) $E = \frac{Vs\ x\ Is}{Vp\ x\ Ip}$ x 100%; $\quad E = \frac{Power\ output}{power\ input}$ x 100%

$80 = \frac{50 x 5 x 100}{Power\ input} =$

Power input = $\frac{50\ x\ 5\ x\ 100}{80}$; = 312.5w

= 312.5w; (3mks)

(ii) 240 x Ip = 312.5w

$IP = \frac{312.5}{240}$;

= 1.302 A; (2mks)

(c) (i) Changing magnetic flux linking with the coil causes an induced current in the coil. (2mks)

(ii) Increasing the speed of rotating of wheel; (1mk)

17. (a)

Sound waves	Electromagnetic waves
Longitudinal	Transverse
Require material medium	Do not require a material medium
Have compressions and rare factions	They have crests and troughs
Particles moves parallel to wave Motion	Particles moves perpendicularly to the wave motion.

Any two pairs (2mks)

(b) (i) 2 ½ Waves = 0.002 sec

1 wave = $\frac{0.002}{5}$ x 2;

= 0.0008 sec; (2mks)

(ii) $V = \lambda f$;

$$V = \frac{\lambda}{T}$$

2m x 0.0008 =λ;

λ = 0.0016m

λ = 1.6 x 10^{-3}m;

(c)

d_2=1.25m

d_1=1.5m

d_1 = s x t_1

= 1460 x 1.5

= 2190 m;

d_2 = s x t_2

= 1.25 x 1460

= 1825m;

height = $d_1 - d_2$

= 2190 – 1825

= 365m.; (3mks)

17. Photoelectric effect – The process of ejecting electrons from a metal surface when radiations of enough /sufficient energy falls on the metal surface.; (1mk)

(b) Energy of the radiation /frequency /wave length(any one); (1mk)

Any one;

V_S (V)	1.35	1.15	0.93	0.62	0.36
λ x 10^{-7}m	3.77	4.04	4.36	4.92	5.46
f (Hz) x 10^{14}	7.96	7.43	6.88	6.10	5.49

4 correct values all correct (2mks)

(II) (i) Threshold frequency = 4.5 x 10^{14} Hz (1mk)

(ii) eVs = hf – hfo

$$Vs = \frac{h}{e} f - \frac{hfo}{e}$$

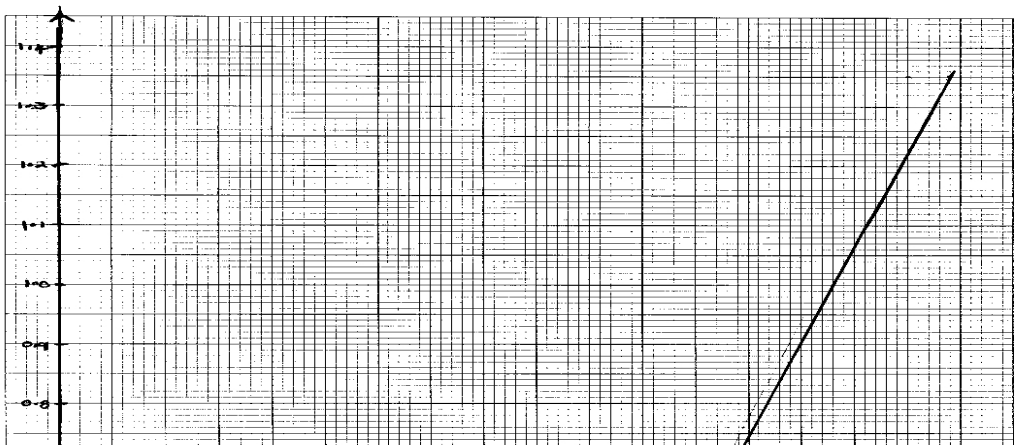
$$\text{Gradient} = \frac{h}{e}$$

(ii) Gradient $\frac{\Delta Vs}{\Delta f} = \frac{1.35 - 0}{(8.0 - 4.5)x10^{14}}$; = $\frac{1.35}{3.5}$ x 10^{-14}

= 3.85 x 10^{-15}

∴ h = 3.85 x 10^{-15} x 1.6 x 10^{-19};

= 6.16 x 10^{-34} Js; (3mks)



Frequency $x10^{14}$(HZ)