**DECEMBER EXAM**

**232/2 PHYSICS PAPER 2 MARKING SCHEME 2021**

**TIME: 2 HOURS**

**SECTION A**

1. - Secondary cells are renewed/re-charged whereas primary cells are not; 🗸1
	* Secondary cells generate higher electromotive force than primary cells; any 🗸
2. Earth’s North – South direction 🗸1
3. Negatively charged
4. Few –ve charges are attracted at the cap; More –ve charges are attracted to the cap inducing positive charge on leaf and plate hence more divergence.; 🗸
5. Mag = v ;

 u

 = 45 ; 🗸1

 30

 = 1.5

 But hi = mag🗸1 hi = 1.5

 ho 10

 hi = 15cm

hi = 0.15m; 🗸1

Card board



Arrow shown on the conductor;

🗸1

***Figure 2***

Conductor

1. - doping tetravalent element with trivalent element; 🗸1
	* During the bonding there is a deficit of electron – hole 🗸1
2. 1/25 + 1/(2 +3) 🗸1 = 1/25 + 1/5🗸1

1/C = 1 + 5/25

 1/C = 6/25

 = 4.167µF; 🗸1

 9. Np = Vp; 🗸1

 Ns Vs

 Ns = 480 x 9; = 18; 🗸1

 240

10. - (infra-red) Photography; 🗸1

 - Heat sensors ( thermocouple detectors, bolo meter and heat seeking missiles ); 🗸1

 - cooking

 - heating

 - (to warm) green houses ( any 2)

11. P = VI

 I = P/V

 = 3x 100 + 10x40 + 8x60🗸1

 240 240 240

 = 1.25 + 1.667 + 2.0

 = 4.917 A 🗸1

 Suitable fuse in circuit = 5 A fuse; 🗸1

12. - Virtual; 🗸1

 - Upright; 🗸1

 - Diminished 🗸1 Any 2

13. Sin i = 4; 🗸

 Sin r 3

 Sin 30 = 4; 🗸

 Sin r 3

 ¾ x 0.5 = Sin r

 r = 22.02°🗸

 **SECTION B**

14 a) Shape ; 🗸1

 Same wavelength; 🗸1

 

λ

λ

 b) - Constant phase difference / same C frequency ; 🗸1

 - Approximately same amplitude🗸1

 c) i) V = fλ

 λ = v/f 🗸1

 = 334/256

 = 1.305m 🗸1

 ii) - Temperature ; 🗸1 ***Any two correct***

 - Direction of wind🗸1

 - Humidity

15. a) i) Emission of electrons from a surface when irradiated with radiation of sufficient

 frequency; 🗸1

 ii) (I) Workability of set up 🗸1

 Labelling 🗸1

 

 Electroscope

Zinc Plate

U.V light

1. Irradiate the Zinc plate with uv light ; 🗸 Electrons are ejected and hence leaf diverge reduces. 🗸
	* Nature of emission is thus electrons🗸

b) i) - Work function of metal ; 🗸

 - Freq. of radiation ; 🗸1

 ii) h = grad x e; 🗸1

***h = Grad; xe***

***Extract;***

***Subst ;***

***Ans;***

***Ø = extract***;

h = ( 3.6 – 0); x 🗸-1.6 x 10-19; 🗸1

 (14 – 5.2) x 1014

h = 6.545 x 10-34; 🗸1

ø = y – intercepts ;

 e

ø = -2.1 x -1.6 x 10-19

 = 3.36 x 10-19 J 🗸1

 16. a) – Both axes labelled with appropriate units; 🗸1

- Simple and uniform scale; 🗸1

- Correctly plotted point ½ mark each maximum of 4 points🗸2

-straight line with **positive** gradient passing through at least 3 correctly plotted points🗸1

 TOTAL =5MKS



***Resistance = gradient***

***= 2.60 – 1.00***

 ***(350 – 150) x 10-3***

***= 8.0 ± 0.2 Ω***

***Voltage(V)***

 Current(mA)

1. Resistance = slope of Graph ; 🗸

= 2.2 – 1.4 🗸

 0.3 – 0.2

= 8Ω; 🗸

 17. a) i) 3200x ½ x ½ x ½x ½ = 400; 🗸1

 :half life = 40/4 hrs

 = 10hrs: 🗸

 ii) NO half – lifes = 30/10 or 3 half lives ; 🗸1

 No. undecayed = ½ x ½ x ½ x 4.0x 1023

 = 0.5x1023

= 5.0x 1022 atoms 🗸1

 No decayed = ( 4.0 - 0.5) x 1023

 = 3.5 x 1023 🗸1

1. m = 238; 🗸1

n = 92; 🗸1

1. i) They condense on air ions caused by radiations at low temperature 🗸1

ii) - Piston is moved down suddenly making air to expand suddenly

too and thus causing cooling 1at low temperature vapour is saturated 🗸 radiation ionizes airy 🗸 and ionized air act as nuclei on which the vapour condenses forming tracks, 🗸

 18. a) i)

 

X - ray

 ii) A- Copper anode; conduct heat away from target;

 B- Tungsten or molybdenum ( or hard target); stops fast moving electronic

 in a short time;

1. Concave focusing cathode;
	* Focus electrons onto target B;

b) - Cathode is heated electrically to emits electrons; 🗸1

 - E.H.T between anode and cathode accelerate electrons to very high speed; 🗸1

 - Fast moving electrons bombard hard target and x – rays are produced; 🗸1

c) i) - Increase accelerating potential; 🗸1

 - Increase cathode current; 🗸1

1. Electrical energy ; heat energy K.e x-rays Heat🗸1

(***filament cathode***)

  ***Any two correct***

1. To minimize possible loss of electron energy by collision with air particles; 🗸1