***LANJET CLUSTER JOINT EXAMINATION JULY/AUG - 2018***

**MARKING SCHEME**

**232/2**

**PHYSICS**

**PAPER 2**

**JULY/AUG 2018**

**SECTION 1**



3.  *A will have a positive charge when charged rod is brought near metal A. positive charges are*

 *attracted towards it while the negative charges are repelled.*

*4.* Work function = hfo

⇒ fo =

= ✓

= 1.03 x 1015 HZ

*5.* (a)

R

~

 (1 Mark for correct directions)

(b)

+ Voltage (V) -

Time (Sec)

6. The image is diminished and upright.

7. (i) D – South pole**;**

**A B**

**C D**

 (ii)

Correct field pattern**;**

Direction of field lines**;**

**8.**

9. f = 2HZ

 T=1 = ½ = 0.5sec

 f

 t3= ¾ x 0.5 = 0.375sec

10. The induced current flows in such a direction that produces magnetic effect that opposes the change producing it. (1mk)

11. a) **A** – zinc

 **B**- Dilute sulphuric acid.

 b) The bulb goes off because of a simple cell polarization and local action

12. In (a) the load is before the fuse so blowing out the fuse does not cut off power from the load . ie the load is still at a higher potential while in (b) the fuse is before the load so melting of the fuse disconnects the load from the power √1

13. x-rays → uv rays → red light→micro waves

**SECTION II**

14. (a) Using, = +

 Taking = 0

 ⇒ = = 0.06 ✓ Extrapolating the line to intercept the x and y axis.

 f1 =

 = 16.67cm

 Taking = 0

 ⇒ = = 0.055 ✓

 f2 =

 = 18.18cm

 f = ⇒ ✓ = 17.43cm ✓

 (b) = +

 (i) = + ✓

 ⇒ v = = 60cm ✓2

 ⇒ Image is 60cm from the lens on the opposite side to that object.√

 (ii) The image is real ✓

(c ) E = 12RT

 = 132 x 8.5 x 1.5 x 60

 = 1.293 x 105J

1. (i) Power consumed by five 60W bulb = 60 x 5 = 300W = 0.3Kw
	* + - 1. Power consumed per day = 0.3 x 3.5 = 1.05Kwh

 (ii) - Power consumed in 7 days = 1.05 x 7 = 7.35Kwh

 Cost per week = No. of Kwh x cost per Kwh

 = Ksh. 49.25

15 .(a) Measures both D.C and A.C (1mk)

 Its accurate and does not take any current (1mk)

 (b) Presence of magnetic coils (1mk)

 Incoming signal from the aerial is fed into the grid

 (c)i). Grid controls brightness of the spot (1mk)

 ii). x-plates –horizontal displacement

 -time base control (1mk)

 iii). Identify the position of the electron beam (1mk)

(d) (i) To focus the electron beam produced onto the target.

 (ii) To accelerate the electrons to give them enough K.E. to produce X-rays at the anode

 (iii) To absorb stray X-rays.

 (iv) To withstand the high temperature (immerse heat) preventing the target from melting since most of the K.E of the electrons is converted into heat .

16. (a) Radioactivity is the spontaneous disintegration of a nucleus releasing 1mk

alpha, beta and gamma radiations accompanied by the release of energy 1mk

(b) Radioactive substances are harmful to body cells when ingested 1mk

(c)

1. It allows the radiation into the casing🗸1
2. The bromine gas causes quenching effect so that it reduces secondary ionisation.🗸1
3. The radiation enters through the mica window. It causes ionization🗸1postive ions move to the cathode while negative ions move to the anode. A pulse current flows which is measured by scalar or ratemeter

(d) (i) Negative

(ii) A- Beta particles 1mk

B-Alpha particles 1mk

(iii) C more massive than A(1mk)

17. (a) Parallel 1 = 1 + 1 + 1

R 6 4 8

1 = 2 + 3 + 4

R 12

1 = 9

R 12

R = 4 = 11/3Ω

Rt = 4 + 11/3

 = 51/3Ω

 V = IR

 I = V = 4.5

 R 5.33

 = 0.844A

 V = 4 x 0.844

 = 3.377V

(b) (i) D = S X ½t

 = 1450 x ½ x 0.20 s √

 = 145m √

 (ii) Depth from the water surface to the top of the reef

= 1450 x ½ x 0.16

= 1450 x 0.08

 = 116m √

 ∴ Height of sunken reef = 145 - 116

 = 29m√

(c) Np = Vp **;**

 Ns Vs

Vs = 240 x 20

 400

 = 12v

Is = V= 12**;**

 R 50

 = 0.24A**;**

1. (a) (i) Dispersion of white light ✓

 (ii) X – Red ✓

 Y – Violet ✓

(iii) Red has the lowest frequency/longest wavelength hence it is least deviated while violet has the highest frequency/short wavelength hence it is most deviated. ✓

(iv) Acts as a point source of light. ✓

 (b) (i) ang = ✓

 = ✓

 = 1.6667 ✓

 (ii) Sin C =

 =

 C = Sin-10.5999

 = 36.86

C

(

600

r

θ

 (iii) = ang

 Sin θ = 1.6667 x Sin 31.20

 θ = Sin-1 0.8634

 = 59.70

19. (a) The measure of the amount of change a capacitor can store when connected to a given voltage or change stored per unit voltage✓

 (b) The leaf falls. ✓ The sharp pin discharges the electroscope by concentration of charges at sharp points. Leading to leakage of charges.

 (c) (i) Charge Q1 on C1 is given by

 Q1 = C1V or Q1 = C1V

 = 0.6μF x 4.5 = 0.6 x 10-6 x 4.5

 = 2.7μC = 2.7 x 10-6C

 (ii) CT = C1 + C2

 = (0.6 + 1.0) μF

 = 1.6μF

 = 1.6 x 10-6F

 (iii) 4.5V, All the voltage drop is across C1. No current through C2.

 Voltmeter reading p.d drops below 4.5✓; the charge on C1 is distributed to C2. Since the value of C1 and C2 remain constant, when Q on C1 reduces, then Q1 = C1V implies V must reduce also, hence voltmeter reading.

 (d) – Reduce the area of overlap for the plates ✓

 - Increase the distance between the plates ✓