**SCHOOL BASED FORM 4 EXAMINATION OCTOBER 2018**

**232/2 PHYSICS Paper 2 Marking Scheme**

1. New object distance = 5 – 2 = 3cm

Distance between tip and its image = 3 + 3 ✓

= 6cm✓

2. a) Like poles repel, unlike poles attract. ✓

b) Pole X is South pole ✓

3. Convex mirror gives a **wider field of view of** ✓the rear (behind) compared to plane mirror.

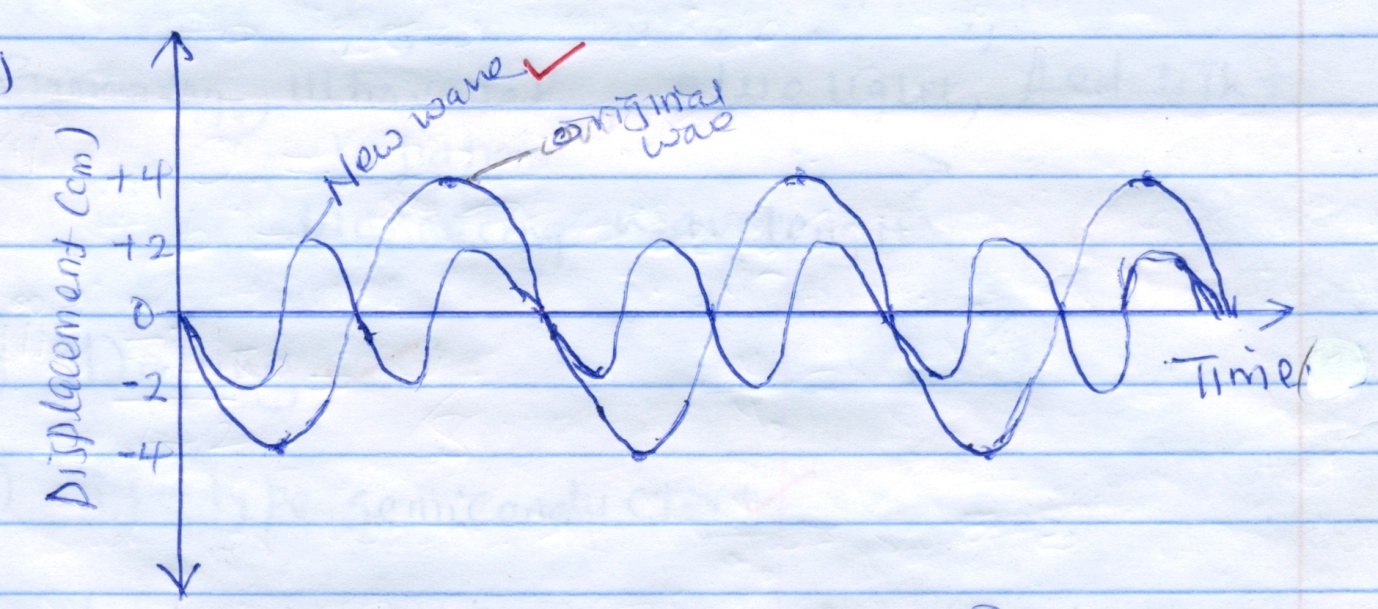
4. a) Period, T = 8.0 x 10-4S✓

Frequency = 

= 1250

= 1.25 x 103 Hz

b)



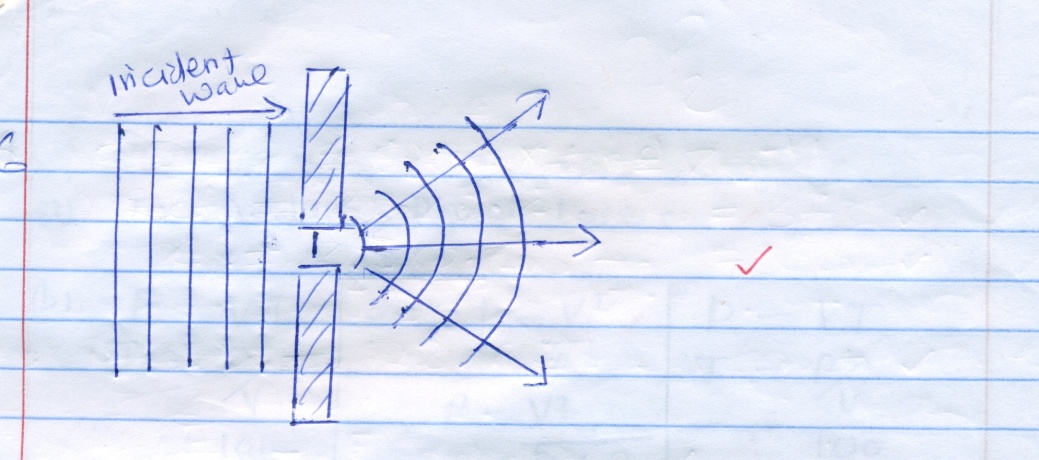
5. a) Primary cells cannot be recharged after use while secondary cells can be recharged after use. ✓

b) Polarization is reduced by adding a depolarizer

or

Adding Manganses (VI) oxide✓

6.



7. 2 Distance = Speed x time✓ (2d = vt)

2x = 320 x 0.8 ✓

x = 320 x 0.8

2

x = 128m ✓

8. Gamma rays, Ultra violet, Blue light, Red light

Radiation

Increasing wavelength ✓

9. a) Doping ✓

b) N – Type semiconductor ✓

10. a)

N

S

N

S

Conductor

Force ✓

b) Reduce the amount of current. ✓

or

Reduce magnetic field strength.

11. a) To reduce power losses ✓

b)

I =

=

= 5A

R =

=

= 4Ω ✓

Or

P =

=

=

=

= 4Ω

I =

=

= 4Ω ✓

Or

I =

=

= 5A

P =

R =

R =

= 4Ω ✓

12. a) The current flowing through a conductor is directly proportional to the potential difference

across the conductor provided Temperature and other physical conditions are kept constant. ✓

b) Effective Resistance =

=

= 2Ω ✓

V = IR

I = ✓ = = 2.5A ✓

**SECTION B (55 MARKS)**

13. a) The direction of induced current is such as to oppose the change causing it. ✓

b) i) Deflects to the right handside ✓Because by Lenz’s law, end A of the solenoid produces a

South pole and there current is flowing in direction X to Z. ✓

ii) - Decreasing the strength of the magnet

* Decreasing the number of turns in the solenoid.
* Decreasing the speed at which the solenoid moves.

Any ✓

c) The core is made up of thin sheets of insulated soft iron plate (ie. Core is laminated) instead

of using a block of iron core✓

d) i) The galvanometer deflects in one direction and goes back to zero when switch is closed. ✓

When the switch is open the galvanometer deflects in the opposite direction then to zero. ✓

ii) The deflection would be smaller.

e) i) Step down transformer. Because the number of turns in the primary coils are more than the

number of turns in secondary coils. ✓

ii) ✓ VS =

= 24V✓

iii) Power in primary =VPIP

= 120 x 0.5

= 60W

Power in secondary = VS x IS

= 24 x 2

= 48V

Efficiency = ✓

=

= 80% ✓

14. a) Like charges repel, unlike charges attract. ✓

b) As the rod approaches the cap, the positive charges initially attracts the negative charges on the

leaf and plate before the leaf falls. ✓ As the rod is brought nearer, net positive charges are

induced on the leaf and plate, where they repel each other making the leaf rise again. ✓

c) The milliameter record current as the capacitor is charging. ✓ When the capacitor is fully

charged, it offers an equal P.d in the opposite direction therefore no current flows. ✓

d) i) 2 + 10

= 12μF✓

CT =

=

= 2.4μF✓

ii) Q = CV

= 2.4 x 240✓

= 576 μC

= 5.76 x 10-4 C✓

iii) V = ✓

=

= 48V✓

15. a) -The ray of light must be travelling from an optically denser medium to an optically rarer

medium.

- The angle of incidence must be greater than the critical angle. Any ✓

b)

Normal

C

Refracted ray

c) η = ✓

Height = Real depth = n x Apparent depth

= 1.48 x 11.4

= 16.872cm ✓

d) i) – The mirror absorbs some incident light while the prism does not.

- The mirror silvering peels off but this does not happen in prism.

- The mirror is thick and produces multiple images unlike prism.

Any ✓

ii)

Object

Image ✓

Eye

e) i) – Object distances, u, using a metre rule. ✓

- A image distance, V, using a metre rule. ✓ any

ii) Extrapolate the graph to cut either axis or both.

At intercept, = 0

* .: = , = value of intercet

f = = ✓

or f = 4cm

At intercept, = 0

.: = 🡪 f = = 4cm

f) i) – Too short eyeball ✓

- Lens with too long focal length✓

ii) By wearing converging lens spectacles. ✓

16. a) I – Copper is a good conductor of heat and therefore conducts heat produced. ✓

II – To accelerate electrons from the cathode to the anode. ✓

or

To give electrons sufficient kinetic energy.

ii) Decrease the amount of heating current in the filament. ✓

iii) X-ray penetrate more in less dense material and penetrate less in denser materials. ✓

b i) The emission of electrons from a metal surface when the metal surface is irradiated with

electromagnetic radiation.

b) I E = hf

= 6.63 x 10-34✓ x 6.25 x 1014

= 4.14373 x 10-19 J✓

II Wo = Hfo

= 6.63 x 10-34 ✓x 5.5 x 10-14

= 3.6465 x 10-19 J✓

III – KE = hf ­- Wo

= (4.14375 – 3.6465) x 10-19✓

= 0.49725 x 10-19

= 4.972 x 10-20 J✓

17. i) E – Filament ✓

F – Y – Plate✓

ii) Thermionic emission✓

b) i) Alpha particles have higher charge (+2) ✓

Compared to Beta particles (-1)

* Alpha particles are heavier compared to Beta particles.

Any ✓

ii) a = 234✓

b = 84 – 2 = 82 ✓

iii)



✓

✓