**PHYSICS PAPER TWO MARKING SCHEME**

**232/2**

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)

C

Normal

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)

Eye

Image ✓

Object

 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)

 

✓

✓