

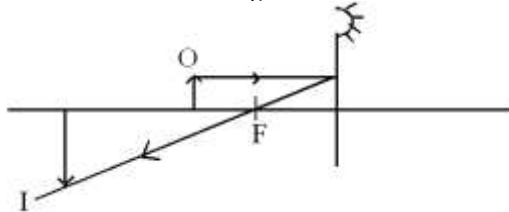
END TERM EXAM
 PHYSICS
 232/2
 PHYSICS PAPER 2
MARKING SCHEME

SECTION A

1.



2.



rays with arrows position of F

3. Depolarizer

4. (a) $4 + 3 = 7$



(b) $I = \frac{12}{35} + 12 = \frac{144}{35} = 4.1143A$

$C(4) = \frac{5}{12} \times 4.1143 \times 4 = 6.857V$

5 X - North
 Y - South

6 Let the cliff be χ cm apart

Time for 1st echo = $\frac{3}{2}$ in 1.5sec.

$$3 = \frac{2\chi}{330}$$

$$2\chi = 990$$

$$\chi = 495m \checkmark^1$$

$$= 1320m \checkmark^1$$

Alternative

$$\frac{2d}{t} = V \checkmark^1$$

$$\frac{2d}{(3 + 5)} = 330 \checkmark^1$$

$$d = \frac{330 \times 8}{2}$$

Time for the second echo = $\frac{5}{2} = 2.5$ sec.

$$\begin{aligned}
 1.5 + 25 &= 4.0 \text{sec. } \checkmark^1 \\
 D &= 5 \times t \\
 &= 330 \times 4 \\
 &= 1320 \text{m}
 \end{aligned}$$

7. $S = vt = 330 \times 0.6 = 99 \text{m}$

b) (i) $E = IR + Ir$
 $E = 0.25 \times 5.5 + 0.25 r$
 $E = 0.5 \times 2.5 + 0.5 \times 5$
 $E = 1.35 + 0.25r$
 $E = 1.25 + 0.5 r$
 $0 = 0.10 - 0.25 r$
 $\Rightarrow 0.25r = 0.10$
 $\frac{0.1}{0.25} = 0.4 \Omega$
 $E = 1.35 + 0.25 \times 0.4$
 $= 1.45 \text{V}$

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9. a) Ratio of sine of angle of incidence to sine of angle of refraction for a given pair of media.

b) $n = \frac{1}{\sin C} = \frac{1}{\sin C 43.2^\circ} = 1.461$

10 Hardening of lead sulphate on the lead plates 1

SECTION B 55 MARKS

11 (a) A metal rod is a good conductor of charge hence the electroscope

- (b) (i) Increase
- (ii) Increases
- (c) (i) Induction
- (ii) Electrons from the earth to the sphere to neutralize the repelled positive charges
- (iii) Negative charges
- (d) (i) Series $= \frac{3 \times 3}{3+2} = \frac{9}{5} = 1.8 \mu\text{F}$
- in parallel with $2 \mu\text{F}$
- $C_T = 1.8 + 2 = 3.8 \mu\text{F}$
- In series with $1 \mu\text{F}$
- $C_T = \frac{3.8 \times 1}{3.8+1} = \frac{3.8 \mu\text{F}}{4.8 \mu\text{F}}$

$$= 0.78\mu\text{F}$$

$$= 7.8 \times 10^{-7}\text{F} \checkmark$$

(ii) $7.8 \times 10^{-7} \times 10 \checkmark$

$$= 7.8 \times 10^{-6} \text{C} \checkmark$$

(iii) $E = \frac{1}{2}CV^2 \checkmark$

$$= \frac{1}{2} \times 7.8 \times 10^{-6} \times 10 \checkmark$$

$$= 3.9 \times 10^{-5}\text{J} \checkmark$$

12. (a) E.m.f is the p.d. across the battery in the open circuit while terminal voltage is the p.d. across the cell in a closed circuit.

(b) (i) E.m.f = 1.625V (show unit)

(ii) $E = IR + Ir$
 $V = E - Ir$
 $V = Ir + \text{Slope} =$
 $-r = \frac{1.5 - 1.0}{0.16 - 0.8} = \frac{0.5}{-0.64} = -0.78$
 $r = 0.78\Omega$

13. a) i) Transverse wave 1

The particles vibrate at right angle to the direction of motion of the wave 1

ii) The wavelength = 50cm or 0.5m 1

iii) $v = \lambda f$ 1

$$f = \frac{v}{\lambda}$$

$$= \frac{0.5}{0.0278}$$

$$= 18\text{Hz} \quad \text{input type="checkbox"/> 1$$

b) i) Bright and dark fringes are formed 1

Bright fringes are formed where constructive interference occurs while dark fringes are formed where destructive interference occurs 1

ii) Produce coherent sources of light 1

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(a) Soft iron

(b) The current flows through the solenoid; it is magnetized and attracts the soft iron armature.;

(c) The magnetized core attracts the soft iron armature. The pivot armature pushes the springy metal strip which joins contact B and A.;

- (d)
- (i) The core (1 mark)
It loses its magnetism;
- (ii) Soft iron armature. (1 mark)
Soft iron goes back to its original position thus switching off the current in the circuit.;
- (e) Give **one** other application of an electromagnet. (1 mark)
Electric bell, telephone receiver, moving coil loudspeaker and circuit breaker.
- (f) State two ways in which an electromagnet could be made more powerful. (2marks)
Using a soft iron core, increasing the current and
Increasing the number of turns;;
15. (a) (i) Dispersion of light.
(ii) X – Red
Y – Violet
- Red has the lowest frequency/longest wavelength hence least deviated while violet has the highest frequency/shortest wavelength hence most deviated.
(iii) Act as point source of light.
16. (a) The current flowing through the conductor is directly proportional to the potential difference across its ends provided temperature and other physical conditions are kept constant.
- (b) (i) When the switch is closed the current flows through the coil which offer resistance hence dissipating heat.
(ii) $V = IR \checkmark^1$
 $R = \frac{V}{I} = \frac{12}{25} \checkmark^1 = 4.8\Omega \checkmark^1$
- (iii) Heat = $VIt \checkmark^1$
 $= 12 \times 2.5 \times 60 \checkmark^1$
 $= 1800J \checkmark^1$
- (iv) - Increasing the number of coils. \checkmark^1
- Increasing the current. \checkmark^1
- (c) The readings will decrease because the resistance is decreased. \checkmark^1