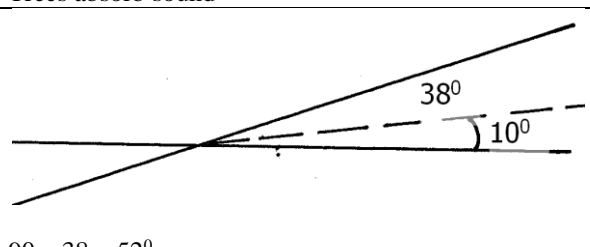
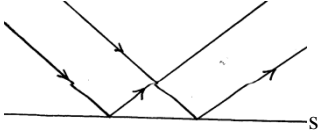


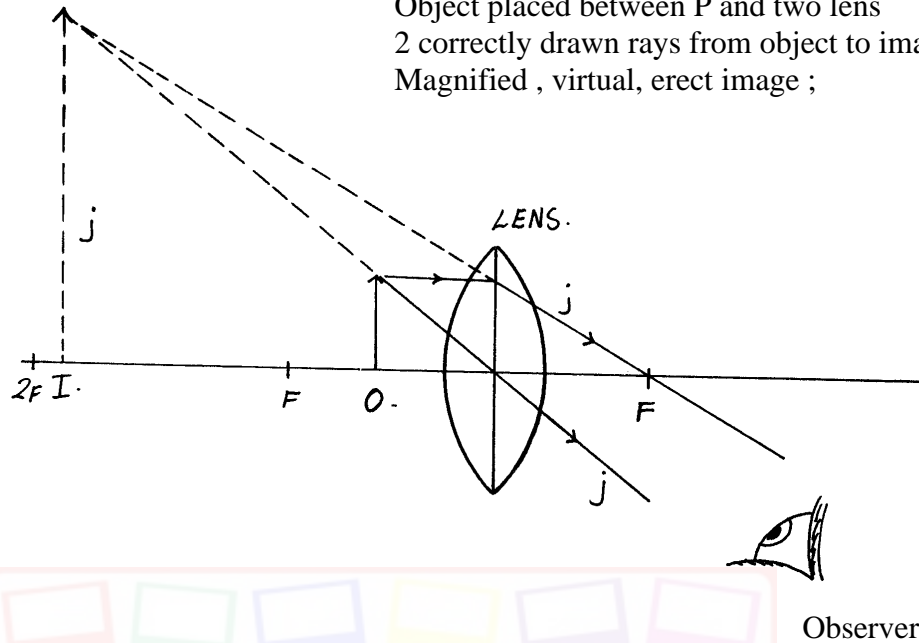
**END TERM 2 2025**  
**JULY 2025**  
**232/2**  
**PHYSICS**  
**Paper 2**  
**MARKING SCHEME**

1	A It has stronger magnetic field than B	✓1 ✓1
2.	(i) Magnetic material (ii) – using larger current - Increasing the no of turns - Using more loader arms	✓1 ✓1 ✓1 Any two
3.	Trees absorb sound	✓1
4.	 $90 - 38 = 52^\circ$	
5.	70Ah          60Ah - Plates with large surface – smaller surface area plates - Many plates hence bigger – A few plates hence look smaller	
6.	$E = IR + Ir$ $1.5v = 0.5 \times 2.7 + 0.5r$ $1.5 - 1.35 = 0.5r$ $r = 0.3\Omega$	
7.	$\lambda = 30/3 = 10m$ $f = v/\lambda = 20/10 = 2m/s$	✓ Formular  ✓ Substituti on ✓Answer
8.	- Biconvex lense - Because the grandfather is having long sightedness eye defect	✓1 ✓1
9.	- Leaf divergence increases - Like charges repel	✓ Correct Observati on ✓ Reason No mark if the observati on is wrong
10. (a)	- Increase the area of overlap of the plates - Decrease the distance between plates	✓mark ✓ mark
10. (b)	Total capacitance in parallel = $2 + 3 = 5 \mu F$ Effective capacitance = $C_T = (5 \times 1.5) / (5 + 1.5) = 1.154 \mu$ Total Charge stored $Q_T = C_T V = 10 \times 1.154 = 15.54 \mu F$ Charge stored by $1.5 \mu F$ Capacitor = total charge = $15.54 \mu F$	✓ mark for $C_T$ ✓mark for $Q_T$ ✓mark
<b>SECTION B</b>		
11.	(a) (i) The ratio of the sine of angle of incidence to the sine of angle of refraction is a constant for a pair of media (ii) – Do not absorb light energy like mirrors - Not affected by thickness as mirrors - Do not wear off like the peeling of silvering on mirror.	✓1

	<p>(b) (i) <math>k_{nw} = k_{na} a_{nw}</math>  <math>= \frac{1}{1.44} \times 1.33 = 0.9236</math></p> <p>(ii) <math>i = 70^\circ</math>  <math>\sin i = 0.9236</math>  <math>\sin r</math>  <math>\sin r = \frac{\sin 70^\circ}{0.9236} = 1.0174</math></p> <p><math>r</math> is greater than <math>90^\circ</math> hence the light reflection</p>  <p>(iii) The different colours travel at different velocities hence would have different angles of refraction and are dispersed</p> <p>(iv) The eye would see a spectrum since the light rays are dispersed in the kerosene layer and are internally reflected at the kerosene – water surface the eye would see a spectrum at the surface</p>	
12.	<p>(a) Current flowing through a conductor is directly proportional to the potential difference across it provided the temperature and other physical conditions are kept constant</p> <p>(b) (i) emf of the battery equal to <math>v</math> intercept 9.2V lmk          (ii) internal resistance = gradient of the graph . gradient</p> $r = 2.5 \text{ } 3 \Omega \quad 3\text{mks}$ <p>(b) (i) The work done in driving charges through the coil is high due to its resistance. This energy is converted into heat in the coil</p> <p>(ii) <math>V = IR</math>      <math>R = \frac{V}{I}</math> ✓      <math>= \frac{12V}{2.4}</math> ✓  <math>= 5.0 \Omega</math></p> <p>(iii) <math>H = VIt</math>  <math>H = 12 \times 2.4 \times 60</math>  <math>= 1728J</math></p> <p>(iv) – Using a source with higher emf          - Reducing the length of the coil  <math>= P = \frac{V^2}{R}</math></p>	<p>✓1</p> <p>✓1</p> <p>✓2</p> <p>✓1</p> <p>✓1</p> <p>✓1</p> <p>✓1</p> <p>✓1</p>
13.a)	<p>i) In transverse wave, the vibration of particles is perpendicular to the direction of travel of the wave but in longitudinal the vibration is parallel to the direction of the wave travel ✓1</p> <p>ii) -Sound wave requires medium for transgression but e.m waves does not require medium. ✓1          -Sound wave is longitudinal and e.m wave is transverse. ✓1</p> <p>b)</p> <p>i) <math>V = \frac{2d}{c}</math> ✓1 = <math>\frac{(2 \times 400)m}{2.5s}</math> ✓1  <math>= 320 /s</math> ✓1</p> <p>ii) <math>320 = 2 \frac{2(x400)}{4.5}</math> ✓1  <math>1280 = 2x - 800</math>  <math>2080 = 2x</math>  <math>1040 = x</math>  <math>\therefore x = 1040</math> ✓1m</p> <p>c)</p> <p>i) Produce coherent sources of light ✓1          ii) Alternating <u>dark and bright</u> fringes ✓1 are observed on the screen on both sides of the <u>central brighter fringe</u> ✓1          iii) i) Dark and bright fringes get closer ✓1          ii) A full spectrum is observed ✓1</p>	

14 a)

Object placed between P and two lens  
2 correctly drawn rays from object to image ;;  
Magnified , virtual, erect image ;



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b)

We have

$$f = \frac{uv}{v + u}$$

But  $m = \frac{v}{u}$  ;

$$u = \frac{v}{m}$$

Substitution  $v/m$  for  $u$  we have ;

$$F = \frac{v}{m + 1} ;$$

Re - arranging we have  $m = \frac{v}{f} - 1$ ;

c)

$$u_1 = 10 \text{ cm}, f_1 = 5 \text{ cm}, v_1 = ?$$

$$1/v_1 + 1/u_1 = 1/f_1$$

$$1/v_1 + 1/10 = 1/5$$

$$v_1 = 10 \text{ cm} ;$$

$$u_2 = ? \quad f_2 = 10 \text{ cm}, v_2 = 20 \text{ cm}$$

$$1/v_2 + 1/u_2 = 1/f_2$$

$$1/20 + 1/u_2 = 1/10$$

$$u_2 = 20 \text{ cm} ;$$

$$d = v_1 + u_2 = 10 \text{ cm} + 20 \text{ cm}$$

$$\therefore d = 30 \text{ cm} ;$$

15.

a) -Commutators / split - rings ✓ 1

-They are the split - rings which reversed the current in the coil every half-cycled

and hence allow rotation to continue. ✓1

b) They provide electric connection to the coil. ✓1

c) -The sides AB and CD of the coil are current carrying conductors in a strong magnetic field which is perpendicular to the wires. . ✓1

-AB has a downward force while CD experience and upward force. . ✓1

-Overall the coil experiences an anticlockwise motion.

c) -Increasing the amount of current. ✓1

-Increasing the strength of magnetic field. ✓1

-Using more turns in the coil. ✓1

-Winding the coil on a soft iron core. ✓1

**(Any one)**

