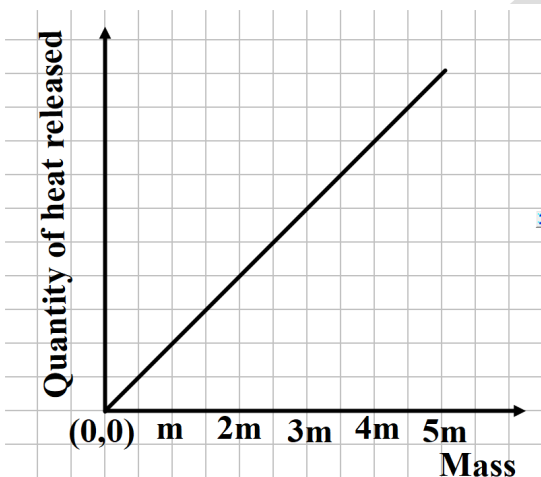
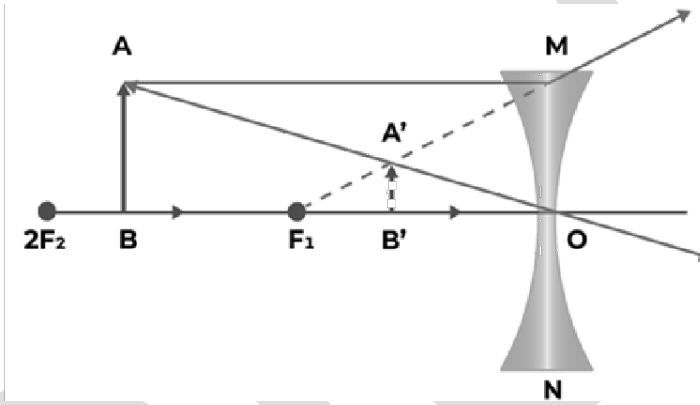


ICSE 2027 SPECIMEN

DRAFT MARKING SCHEME – PHYSICS (SCIENCE PAPER 1)

Question 1		[15x1]
(i)	(c) Light object close to the pivot; heavy object at the far end on the opposite side.	
(ii)	(c) light to chemical	
(iii)	(c) Height of A is one-sixth the height of B.	
(iv)	(d) 4	
(v)	(a) blue	
(vi)	(d) 49°	
(vii)	(d) inverted and upright prisms respectively	
(viii)	(c) Both (A) and (R) are true, and (R) is the correct explanation of (A).	
(ix)	(b) X will be grave, and Y will be shriller	
(x)	(a) Mass number = 222, atomic number = 86	
(xi)	(b) green	
(xii)	(c) latent heat of fusion.	
(xiii)	(c)  P → Q	
(xiv)	(d) remains the same	
(xv)	(a) S1 and S2 only	
Question 2		
(i)	(a) radial (b) decrease (c) $\text{erg g}^{-1} \text{K}^{-1}$ (d) greater (e) temperatures (f) fission	[6x1]
(ii)	(a) Nodding head → Class I (b) Lifting body weight on your toes → Class II	[2]
(iii)	(a) b and d (b) a and c	[2]

Question 3		
(i)	(a) 2 images will be formed (b) concave lens	[2]
(ii)	Energy spent = 1567 - 856 = 711 kWh Time in hours = 711 / 2 = 355.5 hours	[2]
(iii)	(a) X (b) Z	[2]
(iv)	(a) True (b) Both sources will produce a magnetic field: The attraction of a magnetic material does not depend on the polarity of the magnet.	[2]
(v)	(a)  (b) specific heat capacity = $\frac{\text{slope of this graph}}{\Delta t} = \frac{\text{slope of this graph}}{100}$	[2]
(vi)	(a) H_1^3 (b) greater	[2]
(vii)	(a) Total internal reflection (b) 1. Light ray should travel from denser to rarer medium. 2. Angle of incidence must be greater than critical angle for a given pair of optical media.	[3]
Question 4		
(i)	(a) In medium 2, of refractive index μ_2 (b) Wavelength decreases (c) $\mu_1 = \mu_3$	[3]

(ii)	(a) $a > b$ Angle of minimum deviation is inversely proportional to the wavelength of light and wavelength of blue is smaller than wavelength of orange. (b) Values of a and b will increase.	[1+1] [1]
(iii)	(a) Convex lens (b) $v + u = 90$ [Sign convention to be used only for lens formula & NOT for addition of distances] (c) $m = -2$ $v:u = 2:1$ or $-2 = \frac{v}{-u}$ (d) $m = \frac{v}{u} \therefore -2 = \frac{v}{-u} \therefore 2u = v$ As $v + u = 90 \therefore 2u + u = 90 \therefore 3u = 90 \therefore u = 30$ $u = 30 \text{ cm}$ $v = 90 - 30$ $v = 60 \text{ cm}$	[1] [1+1+1]
Question 5		
(i)	 Ray 1 $\rightarrow$ 1 mark Ray 2 $\rightarrow$ 1 mark Virtual diminished image +arrows $\rightarrow$ 1 mark	[3]
(ii)	(a) 150°C (b) 150°C to 60°C (c) True	[1] [1] [1]
(iii)	Heat lost by Cu $= 0.12 \times 400 \times (t - 35)$ Heat gained by water $= 0.84 \times 4200 \times (35 - 15)$ $t - 35 = \frac{0.84 \times 4200 \times 20}{0.12 \times 400} = 7 \times 42 \times 5 = 1470^\circ\text{C}$ $t = 1470 + 35 = 1505^\circ\text{C}$	[1] [1] [1] [1]

Question 6		
(i)	(a) Weight of AC < weight of BC (b) Even though the weights present are the same at both ends, the torque arm of B is less than the torque arm of A. This indicates that the weight of the rod is concentrated more between C and B than between A and C.	[1] [2]
(ii)	(a) No work is done. (b) Negative work is done. (c) Positive work is done.	[1] [1] [1]
(iii)	(a) <u>Empty trolley:</u> Mass = 10kg v =8m/s KE = $\frac{1}{2}mv^2$ = $\frac{1}{2} \times 10 \times 8 \times 8 = 320J$ (c) $\frac{KE_1}{KE_2} = \frac{F_1.s}{F_2.s} = \frac{320}{160} = \frac{2}{1} \therefore F_1: F_2 = 2:1$ (d) work-energy theorem	(b) <u>Loaded trolley:</u> Mass =20kg v =4m/s KE = $\frac{1}{2}mv^2$ = $\frac{1}{2} \times 20 \times 4 \times 4 = 160J$ [1+1] [1] [1]
Question 7		
(i)	(a) <i>Fulcrum → Q and effort → V</i> (b) <i>Load arm = 20cm</i> <i>Effort arm = 100cm</i> $MA = \frac{EA}{LA} = \frac{100}{20} = 5$ (c) <i>First class lever</i>	[1] [1] [1]
(ii)	Time required for longer distance i.e 68 m $t = \frac{2 \times d}{v}$ $t = \frac{2 \times 68}{340} = \frac{4}{10} = 0.4$ $t = 0.4\text{ s}$ <i>time required for shorter distance i.e for x m</i> $t = 0.4 - 0.25$ $t = 0.15\text{ s}$ $0.15 = \frac{2x}{340}$ $2x = 51$ $x = 25.5m$	[1] [1] [1]

(iii)	(a) Resonance The frequency of the tuning fork (300 Hz) matches the natural frequency of the wire B and the amplitude of vibration increases. (b) $f < 300\text{Hz}$ The wire A is thicker than the wire B therefore its natural frequency is less than the wire B.	[1+1] [1+1]
Question 8		
(i)	(a) Since P.D. is same across parallel combination $\therefore 1 \times 6 = I_1 \times 3$ $\therefore I_1 = \frac{6}{3} = 2A$ (b) $I = 1 + 2 = 3A$ (c) False	[1] [1] [1]
(ii)	(a) S (b) metal body of appliance is earthed $I = PV = 2000/220 = 9.09\text{ A}$ 10A fuse is appropriate	[1] [1+1]
(iii)	(a) $R_{of\ X} = \frac{\rho l}{A}$ $R_{of\ Y} = \frac{\rho 2l}{\frac{A}{2}} = 4 \frac{\rho l}{A}$ $R_X : R_Y = 1:4$ (b) $P_X = \frac{V^2}{R} = \frac{10^2}{R}$ $P_Y = \frac{V^2}{R} = \frac{20^2}{4R}$ $\therefore P_X : P_Y = 1:1$ (c) $mass\ of\ X = A \times l \times d = mass\ of\ Y = \frac{A}{2} \times 2l \times d \therefore m_X : m_Y = 1:1$ (d) True $Q_X = mc\Delta T = Ald \times c \times \Delta T_X = \frac{V^2 t}{R} = P_X \times t \rightarrow eq\ 1$ $Q_Y = mc\Delta T = Ald \times c \times \Delta T_Y = \frac{V^2 t}{R} = P_Y \times t \rightarrow eq\ 2$ Eq1/eq2 =1 (rise in temperature will be same in both wires)	[1] [1] [1] [1]
Question 9		
(i)	(a) parallel (b) $V_1 = V_2 = V_3$ (c) Yes	[1] [1] [1]
(ii)	(a) Magnetic flux linked with the coil B changes (and due to electromagnetic induction current is induced). (b) The deflection will be in the same direction. (c) This is because when we decrease the resistance, the magnitude of current increases, increasing the magnetic flux.	[1] [1+1]

(iii)	(a) $\beta : {}_{92}^{238}\text{C} \rightarrow {}_{93}^{238}\text{E} + {}_{-1}^0\beta$	[1+1]
	(b) isotopes	[1]
	(c) It will shift towards the negative plate	[1]