



ICSE 2025 SPECIMEN
DRAFT MARKING SCHEME – MATHEMATICS

Question 1		
(i)	(b) 0	[15]
(ii)	(c) ₹ 68,400	
(iii)	(c) 80 cm ²	
(iv)	(a) 20°	
(v)	(b) 6√3 cm	
(vi)	(c) Statement 1 is true, and Statement 2 is false.	
(vii)	(a) 20	
(viii)	(a) 0	
(ix)	(c) Both A and R are true, and R is the correct reason for A.	
(x)	(d) a = 10, b = 5, c = 15	
(xi)	(d) ₹ 86.40	
(xii)	(c) ₹1925	
(xiii)	(d) ±1	
(xiv)	(b) x – y = 7	
(xv)	(a) ∅	
Question 2		
(i)	$f(x) = 2x^3 + 7x^2 + 2x - 3$ $f\left(-\frac{1}{2}\right) = 2\left(-\frac{1}{2}\right)^3 + 7\left(-\frac{1}{2}\right)^2 + 2\left(-\frac{1}{2}\right) - 3 \neq 0$ $\therefore (2x + 1) \text{ is not a factor of } f(x).$ $f\left(\frac{1}{2}\right) = 2\left(\frac{1}{2}\right)^3 + 7\left(\frac{1}{2}\right)^2 + 2\left(\frac{1}{2}\right) - 3 = 0$ $\therefore (2x - 1) \text{ is a factor of } f(x)$	[4]

	$\begin{array}{r} x^2 + 4x + 3 \\ 2x - 1 \overline{) 2x^3 + 7x^2 + 2x - 3} \\ \underline{2x^3 - x^2} \\ 8x^2 + 2x \\ \underline{8x^2 - 4x} \\ 6x - 3 \\ \underline{6x - 3} \\ \times \times \end{array}$ $f(x) = (2x - 1)(x^2 + 4x + 3)$ $f(x) = (2x - 1)(x + 3)(x + 1)$	
(ii)	(a) Slope of PQ = -1 Equation of PQ: $x + y + 1 = 0$ (b) Slope of AB = 1 $\therefore$ Eq of line AB, $x - y + 6 = 0$ (c) R(-1,0) $S\left(-\frac{7}{2}, \frac{5}{2}\right)$	[4]
(iii)	(a) $\angle BOC = 180^\circ - 80^\circ = 100^\circ \rightarrow \angle BEC = \frac{1}{2} \times 100^\circ = 50^\circ$ ($\angle$ at centre is twice the $\angle$ in remaining segment) (b) $\angle BCD = \angle BCA + \angle ACE + \angle ECD = 40^\circ + 20^\circ + 50^\circ = 110^\circ$ (c) $\angle CED = 180^\circ - 110^\circ - 50^\circ = 20^\circ$	[4]
Question 3		
(i)	$a = 24 \text{ and } T_5 = 8 \rightarrow ar^4 = 8 \rightarrow r^4 = \frac{1}{3}, \therefore T_9 = ar^8 \rightarrow 24 \times \left(\frac{1}{3}\right)^2 = \frac{8}{3}$	[4]
(ii)	$h = \frac{1}{2}(1 + 6), \text{ given } \rightarrow h = \frac{7}{2}$ $\text{Area of wet surface} = \pi r^2 + 2\pi rh \rightarrow \pi r(r + 2h)$ $= \frac{22}{7} \times \frac{7}{2} \left(\frac{7}{2} + 2 \times \frac{7}{2}\right) = 115.5 \text{ cm}^2$	[4]
(iii)	(a) A(3, 3), B(-2, 1), C(3, -1) and D(0, 1) (b) BD and $y = 1$ is the line of reflection. (c) D(0, 1) (d) Invariant point. (e) Concave Quadrilateral or Arrowhead.	[5]

SECTION – B

Question 4		
(i)	(a) $\text{Annual Dividend} = 250 \times 10 \times \frac{7}{100} = ₹175$ (b) $\text{Return \%} = \frac{7 \times 10}{12.50} = 5.6 \%$	[3]
(ii)	$5x - 21 < \frac{5x}{7} - 6 \leq -3\frac{3}{7} + x, x \in R$ $5x - 21 < \frac{5x}{7} - 6 \qquad \frac{5x}{7} - 6 \leq -3\frac{3}{7} + x$ $5x - \frac{5x}{7} < -6 + 21 \qquad \frac{5x}{7} - x \leq -\frac{24}{7} + 6$ $\frac{35x - 5x}{7} < 15 \qquad \frac{5x - 7x}{7} \leq \frac{-24 + 42}{7}$ $30x < 105 \qquad -2x \leq 18$ $x < 3.5 \qquad x \geq -9$ $\left\{ x: -9 \leq x < \frac{7}{2}, x \in R \right\}$ 	[3]
(iii)	$LHS = (\sin\theta + \cos\theta)(\operatorname{cosec}\theta - \sec\theta)$ $= (\sin\theta + \cos\theta) \left(\frac{1}{\sin\theta} - \frac{1}{\cos\theta} \right) = (\sin\theta + \cos\theta) \left(\frac{\cos\theta - \sin\theta}{\sin\theta \cdot \cos\theta} \right)$ $= \frac{\cos^2\theta - \sin^2\theta}{\sin\theta \cdot \cos\theta} = \frac{1 - 2\sin^2\theta}{\sin\theta \cdot \cos\theta} = \frac{1}{\sin\theta \cdot \cos\theta} - \frac{2\sin^2\theta}{\sin\theta \cdot \cos\theta}$ $= \operatorname{cosec}\theta \cdot \sec\theta - 2\tan\theta = RHS$	[4]
Question 5		
(i)	(a) In $\triangle APB$ and $\triangle CPD$, $\angle BAP = \angle DCP$ ($\angle$s on same segment) $\angle ABP = \angle CDP$ ($\angle$s on same segment) $\therefore \triangle APB \sim \triangle CPD$ (AA axiom) (b) $\frac{AB}{CD} = \frac{3}{2} \therefore CD = 6\text{cm}$ (c) $\frac{\text{area}(\triangle APB)}{\text{area} \triangle CPD} = \frac{BP^2}{DP^2} = \frac{9}{4} \rightarrow 9 : 4$	[3]

(ii)	$\text{Qualifying Sum} = \frac{600 \times 24 \times 25}{2} = 1,80,000$ $\text{Interest} = \frac{600 \times 24 \times 25}{2} \times \frac{r}{100} \times \frac{1}{12} = 150r$ $\text{Maturity Value} = ₹15600$ $600 \times 24 + 150r = ₹15600$ $150r = ₹15600 - ₹14400 \rightarrow r = \frac{1200}{150} = 8\%$	[3]																																								
(iii)	<table><tr><th>Class</th><th>x</th><th>$u = d/i$</th><th>f</th><th>fu</th></tr><tr><td>0 – 15</td><td>7.5</td><td>-3</td><td>3</td><td>-9</td></tr><tr><td>15 – 30</td><td>22.5</td><td>-2</td><td>4</td><td>-8</td></tr><tr><td>30 – 45</td><td>37.5</td><td>-1</td><td>7</td><td>-7</td></tr><tr><td>45 – 60</td><td>52.5</td><td>0</td><td>6</td><td>0</td></tr><tr><td>60 – 75</td><td>67.5</td><td>1</td><td>8</td><td>8</td></tr><tr><td>75 – 90</td><td>82.5</td><td>2</td><td>2</td><td>4</td></tr><tr><td></td><td></td><td></td><td>30</td><td>-12</td></tr></table> $\text{Mean} = A + \frac{\sum fu}{\sum f} \times i = 52.5 + \frac{-12}{30} \times 15 = 52.5 - 6$ $= 46.50$	Class	x	$u = d/i$	f	fu	0 – 15	7.5	-3	3	-9	15 – 30	22.5	-2	4	-8	30 – 45	37.5	-1	7	-7	45 – 60	52.5	0	6	0	60 – 75	67.5	1	8	8	75 – 90	82.5	2	2	4				30	-12	[4]
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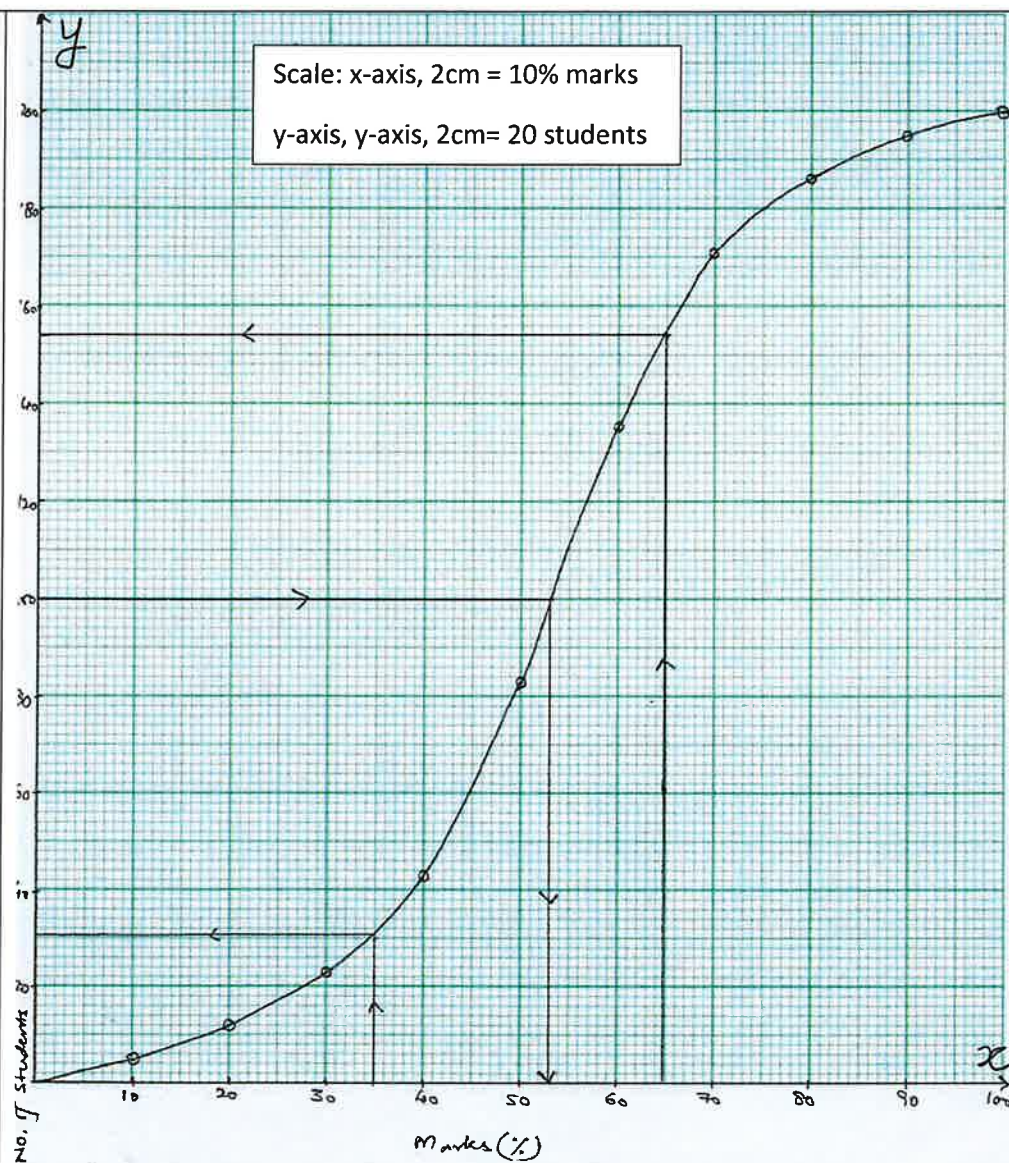
Question 6

(i)	(a) $P\left(\frac{-1+3+0}{3}, \frac{3+(-1)+0}{3}\right) = P\left(\frac{2}{3}, \frac{2}{3}\right)$ (b) $m_{AB} = \frac{-1-(-3)}{3-(-1)} = \frac{-4}{4} = -1$ $m_{CD} = -1$ Required equation, $y - \frac{2}{3} = -1\left(x - \frac{2}{3}\right) \rightarrow 3x + 3y = 4$	[3]
(ii)	(a) In ΔPTB and ΔPAT, $\angle PTA = \angle PBT$ (alt. segment th.) $\angle TPA = \angle BPT$ (common $\angle$) $\therefore \Delta PTB \sim \Delta PAT$ (AA axiom) (b) $PA \times PB = PT^2 \rightarrow 16(16 + AB) = 400 \rightarrow 16 + AB = 25$ $\rightarrow AB = 9 \text{ cm}$	[3]

(iii)	Rajdhani Departmental Store					[4]
	S. No.	Item	Marked Price	Discounted Price	GST	Tax
	1.	Dry Fruits (1kg)	₹ 1200	₹ 1100	12%	$\frac{12 \times 1100}{100} = 132$
	2.	Wheat Flour	₹ 286	₹ 286	5%	$\frac{5 \times 286}{100} = 14.30$
	3.	Bakery Products	₹ 500	₹ 450	12%	$\frac{12 \times 450}{100} = 54$
	Total			₹1836		₹ 200.30
	Grand total		₹ 2036.30			

Question 7

(i)	(a) $In \Delta PAB, \frac{AB}{PA} = \tan 42^\circ$ $\frac{AB}{100} = 0.9004 \rightarrow AB = 90.04 \text{ m}$ $In \Delta PAF, \frac{AF}{PA} = \tan 54^\circ$ $\frac{AF}{100} = 1.3764 \rightarrow AF = 137.64 \text{ m}$ $FB = 137.64 \text{ m} - 90.04 \text{ m} = 47.60 \text{ m} = 48 \text{ m}$	[4]																																												
(ii)	<table><tr><th>Marks (%)</th><th>f</th><th>cf</th><th></th></tr><tr><td>0 – 10</td><td>5</td><td>5</td><td>(a) $Median = 53 \pm 1$</td></tr><tr><td>10 – 20</td><td>7</td><td>12</td><td>(b) $More\ than\ 65\% = 46 \pm 2$</td></tr><tr><td>20 – 30</td><td>11</td><td>23</td><td>(c) $Didn't\ pass = 31 \pm 2$</td></tr><tr><td>30 – 40</td><td>20</td><td>43</td><td></td></tr><tr><td>40 – 50</td><td>40</td><td>83</td><td></td></tr><tr><td>50 – 60</td><td>52</td><td>135</td><td></td></tr><tr><td>60 – 70</td><td>36</td><td>171</td><td></td></tr><tr><td>70 – 80</td><td>15</td><td>186</td><td></td></tr><tr><td>80 – 90</td><td>09</td><td>195</td><td></td></tr><tr><td>90 – 100</td><td>05</td><td>200</td><td></td></tr></table>	Marks (%)	f	cf		0 – 10	5	5	(a) $Median = 53 \pm 1$	10 – 20	7	12	(b) $More\ than\ 65\% = 46 \pm 2$	20 – 30	11	23	(c) $Didn't\ pass = 31 \pm 2$	30 – 40	20	43		40 – 50	40	83		50 – 60	52	135		60 – 70	36	171		70 – 80	15	186		80 – 90	09	195		90 – 100	05	200		[6]
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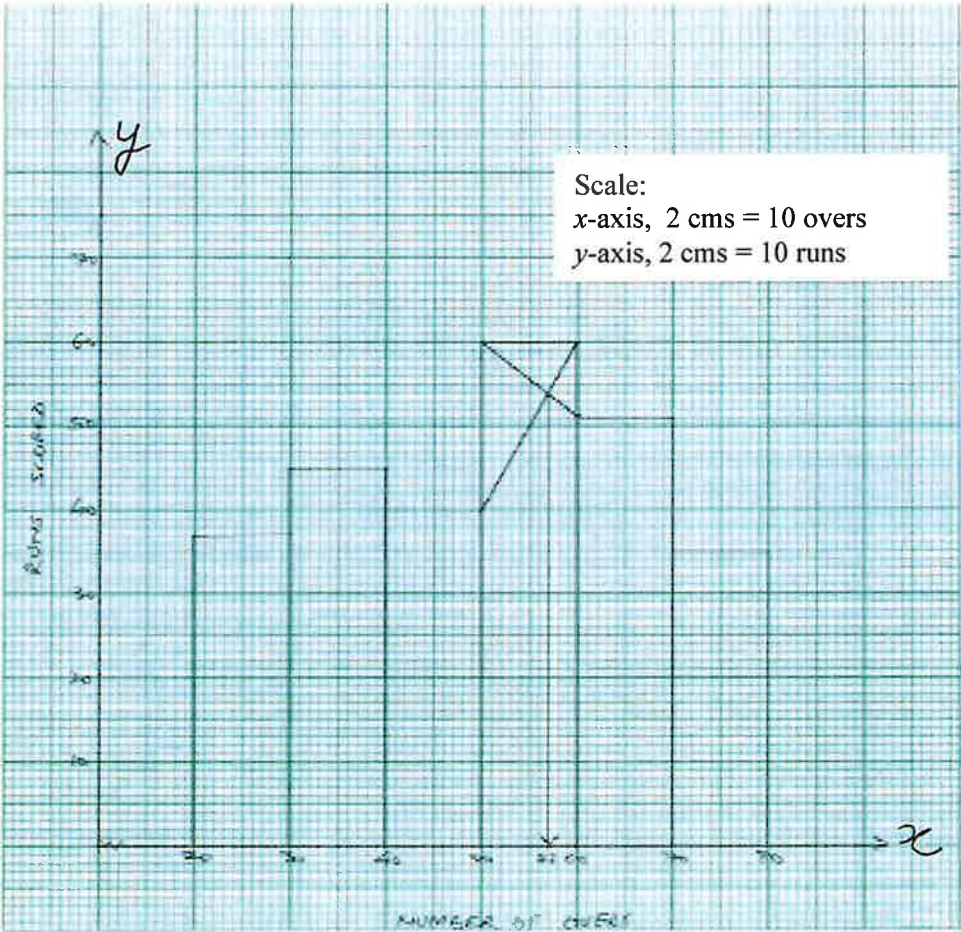


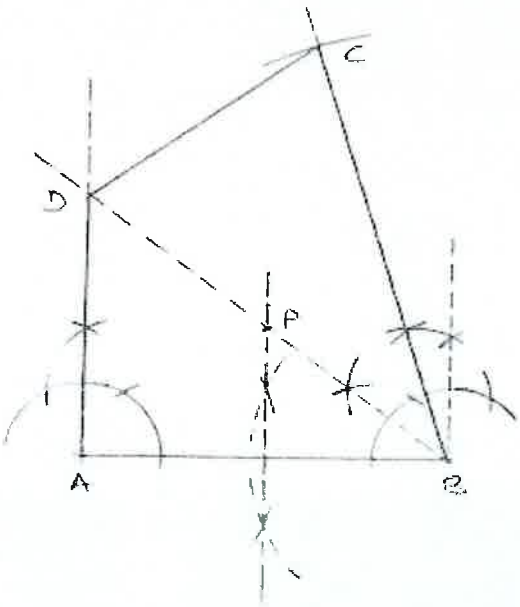
Question 8

- (i). (a) $P(\text{Akbar}) = \frac{1}{3}$ [3]
(b) $P(\text{not correct answer}) = 1 - \frac{1}{4} = \frac{3}{4}$
- (ii) $\frac{x}{y} = \frac{y}{z} \rightarrow y^2 = xz$ [3]
$$LHS = \frac{x}{y^2 \cdot z^2} + \frac{y}{z^2 \cdot x^2} + \frac{z}{x^2 \cdot y^2} = \frac{x^3 + y^3 + z^3}{x^2 \cdot y^2 \cdot z^2}$$
$$\frac{x^3 + y^3 + z^3}{x^3 z^3} = \frac{x^3}{x^3 z^3} + \frac{y^3}{x^3 z^3} + \frac{z^3}{x^3 z^3}$$
$$= \frac{1}{z^3} + \frac{y^3}{y^6} + \frac{1}{x^3} = \frac{1}{z^3} + \frac{1}{y^3} + \frac{1}{x^3} = RHS$$

(iii)	(a) $\text{No. of ball bearings} = \frac{2156}{\frac{4}{3} \times \pi \times r^3} = \frac{2156}{\frac{4}{3} \times \frac{22}{7} \times \left(\frac{7}{10}\right)^3}$ $= \frac{2156 \times 3 \times 7 \times 10 \times 10 \times 10}{4 \times 22 \times 7 \times 7 \times 7} = 1500$ (b) $\text{Mass of each box} = 4 \text{ gm} \times 1500 = 6 \text{ kg}$	[4]
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Question 9

(i)	$\text{Modal Runs} = 57 \pm 1$ 	[3]
(ii)	$a = 3, \quad S_8 = 2 S_5 \rightarrow \frac{8}{2} [2 \times 3 + (8 - 1)d] = 2 \left\{ \frac{5}{2} [2 \times 3 + (5 - 1)d] \right\}$ $4[6 + 7d] = 5[6 + 4d] \rightarrow 24 + 28d = 30 + 20d \rightarrow d = \frac{3}{4}$	[3]
(iii)	$a = q - r, b = r - p \text{ and } c = p - q$ for equal roots, $b^2 = 4ac \rightarrow (r - p)^2 = 4(q - r)(p - q)$ $r^2 + p^2 - 2pr = 4[pq - q^2 - pr + qr]$ $r^2 + p^2 - 2pr + 4pr = 4[pq - q^2 + qr]$ $(p + r)^2 = 4[q(p + r) - q^2]$	[4]

	$(p + r)^2 - 4q(p + r) + 4q^2 = 0$ $\text{let } (p + r) = y$ $y^2 - 4qy + 4q^2 = 0$ $(y - 2q)^2 = 0$ $y - 2q = 0$ $\text{or } p + r = 2q \quad \text{proved}$	
Question 10		
(i)	$\frac{72}{x} + \frac{81}{x+6} = 3 \rightarrow \frac{24}{x} + \frac{27}{x+6} = 1 \rightarrow \frac{24(x+6) + 27x}{x(x+6)} = 1$ $x^2 - 45x - 144 = 0 \rightarrow (x - 48)(x + 3) \rightarrow x = 48 \text{ km/hr}$	[3]
(ii)	$X^2 = \begin{bmatrix} 1 & 1 \\ 8 & 3 \end{bmatrix} \begin{bmatrix} 1 & 1 \\ 8 & 3 \end{bmatrix}$ $= \begin{bmatrix} 1 \times 1 + (1) \times (8) & 1 \times (1) + (1) \times 3 \\ (8) \times 1 + 3 \times (8) & (8) \times (1) + 3 \times 3 \end{bmatrix}$ $= \begin{bmatrix} 1+8 & 1+3 \\ 8+24 & 8+9 \end{bmatrix}$ $\therefore X^2 = \begin{bmatrix} 9 & 4 \\ 32 & 17 \end{bmatrix}$ $\text{and } 4X = 4 \begin{bmatrix} 1 & 1 \\ 8 & 3 \end{bmatrix} = \begin{bmatrix} 4 & 4 \\ 32 & 12 \end{bmatrix}$ $4X + 5I = \begin{bmatrix} 4 & 4 \\ 32 & 12 \end{bmatrix} + \begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix} = \begin{bmatrix} 9 & 4 \\ 32 & 17 \end{bmatrix}$ $\therefore X^2 = 4X + 5I, \quad \text{proved}$	[3]
(iii)		[4]