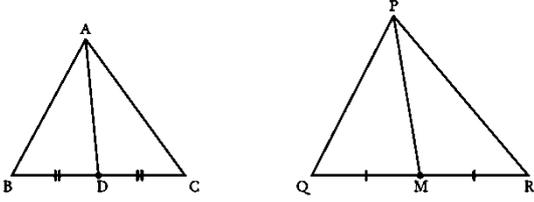


SAHODAYA PRE-BOARD EXAMINATION, 2025-26**CLASS: X****SUBJECT: MATHEMATICS (STANDARD-041)****MARKING SCHEME (SET-1)**

Q. NO.	VALUE POINTS (Any other relevant answer should be awarded properly)	BIT MARK	TOTAL
SECTION-A (This section comprises 20 Multiple Choice Questions (MCQs) carrying 1 mark each.)			
1	(C) 132	1	1
2	(D) -6	1	1
3	(D) -9	1	1
4	(B) 30°	1	1
5	(D) $\frac{1}{2}$	1	1
6	(A) $\frac{-2(x^2-3x)}{2x} + x = 0$	1	1
7	(C) $\frac{1}{2}a^2$ sq. units	1	1
8	(B) $\frac{7}{2}$	1	1
9	(B) 1	1	1
10	(D) 19.404	1	1
11	(B) 2:1	1	1
12	(C) 3	1	1
13	(B) $k = 3$	1	1
14	(D) 5.4 cm	1	1
15	(B) Less than or equal to 0.25	1	1
16	(C) a unit	1	1
17	(B) (3, -10)	1	1
18	(B) 10 cm	1	1
19	(D) A is false but R is true.	1	1
20	(A) Both A and R are true and R is the correct explanation of A .	1	1

	$AD = \frac{1.6 \times 5.1}{4.8} = 1.7 \text{ cm}$	$\frac{1}{2}$	
24	$5 \cdot \left(\frac{1}{4}\right) + 4 \cdot \left(\frac{4}{3}\right) - 1$ $= \frac{\frac{5}{4} + \frac{16}{3} - 1}{\frac{1}{4} + \frac{3}{4}}$ $= \frac{\frac{5}{4} + \frac{16}{3} - 1}{1}$ $= \frac{67}{12}$	1 $\frac{1}{2}$ $\frac{1}{2}$	2
25	$\text{Mode} = L + \frac{f_1 - f_0}{2f_1 - f_0 + f_2} \times h$ $= 40 + \frac{12 - 10}{24 - 10 - 8} \times 10$ $= 40 + 3.3 = 43.3$	$\frac{1}{2}$ 1 $\frac{1}{2}$	2
SECTION-C			
(This section comprises of Short Answer type questions (SA) of 3 marks each)			
26	 <p>$\Delta ABD \sim \Delta PQM$ (SSS criteria)</p> $\frac{AB}{PQ} = \frac{BD}{QM} = \frac{AD}{PM}$ <p>By CPST $\angle B = \angle Q$</p> <p>In ΔABC and ΔPQR</p> $\frac{AB}{PQ} = \frac{BC}{QR} \text{ and } \angle B = \angle Q$ <p>Hence $\Delta ABC \sim \Delta PQR$</p>	1 $\frac{1}{2}$ $\frac{1}{2}$ 1	3
27	<p>LCM of 12, 18 and 27 = 108</p> <p>1st February 2025 + 108 days</p> <p>= 20th May 2025</p>	1 1 1	

28	$\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta} + \frac{\sin\theta - \cos\theta}{\sin\theta + \cos\theta}$ $= \frac{(\sin\theta + \cos\theta)^2 + (\sin\theta - \cos\theta)^2}{\sin^2\theta - \cos^2\theta}$ $= \frac{2(\sin^2\theta + \cos^2\theta)}{\sin^2\theta - (1 - \sin^2\theta)}$ $= \frac{2}{2\sin^2\theta - 1}$ <p style="text-align: center;">OR</p> $a \cos\theta - b \sin\theta = c$ $(a \cos\theta - b \sin\theta)^2 = c^2$ $a^2 \cos^2\theta + b^2 \sin^2\theta - 2ab \sin\theta \cdot \cos\theta = c^2$ $a^2 - a^2 \sin^2\theta + b^2 - b^2 \cos^2\theta - 2ab \sin\theta \cdot \cos\theta = c^2$ $a^2 + b^2 - c^2 = a^2 \sin^2\theta + b^2 \cos^2\theta + 2ab \sin\theta \cdot \cos\theta$ $(a \sin\theta + b \cos\theta)^2 = a^2 + b^2 - c^2$ $a \sin\theta + b \cos\theta = \pm \sqrt{a^2 + b^2 - c^2}$	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">½</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">½</p>	<p style="text-align: center;">3</p>
29	<p>Join OT. Let it intersect at R, then ΔTPQ is isosceles triangle and TO is the angle bisector of angle $\angle PTQ$</p> <p>So OT perpendicular to PQ</p> <p>Therefore OT bisects PQ, which gives $PR = RQ = 4\text{cm}$</p> <p>Also $OR = \sqrt{5^2 - 4^2} = 3\text{ cm}$</p> <p>$\angle TPR + \angle RPO = 90^\circ = \angle TPR + \angle PTR$</p> <p>So $\angle RPO = \angle PTR$</p> <p>So $\Delta TRP \sim \Delta PRO$ (by AA similarity)</p> <p>So $\frac{TP}{PO} = \frac{RP}{RO}$</p> <p>i.e. $\frac{TP}{5} = \frac{4}{3}$</p> <p>so $TP = \frac{20}{3}\text{ cm}$</p>	<p style="text-align: center;">0.5</p> <p style="text-align: center;">0.5</p> <p style="text-align: center;">1</p> <p style="text-align: center;">0.5</p> <p style="text-align: center;">0.5</p>	<p style="text-align: center;">3</p>

30	<p> $AB = 14\sqrt{3}$ cm $OA = 14$ cm Draw $OD \perp AB$, $AD = 7\sqrt{3}$ Let $\angle AOD = \theta$ $\sin \theta = \frac{AD}{OA} = \frac{7\sqrt{3}}{14} = \frac{\sqrt{3}}{2}$ $\theta = 60^\circ$ $\angle AOB = 120^\circ$ $\text{Area} = \frac{\theta}{360} \pi r^2$ $= \frac{120}{360} \times \frac{22}{7} \times 14 \times 14 = \frac{616}{3}$ sq. cm $= 205.33$ sq. cm OR Area of major segment $= \text{area of major sector} + \text{area of triangle}$ $= \frac{\theta}{360} \pi r^2 + \frac{1}{2} bh$ $= \frac{270}{360} \times 3.14 \times 20 \times 20 + \frac{1}{2} \times 20 \times 10 = 1142$ </p>	<p> $\frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$ 1 </p>	3
31	<p> Total Sample Space = 36 (i) $E = \text{Favourable outcome (sum is perfect square)}$ $E = (1,3), (3,1), (3,6), (6,3), (4,5), (5,4), (2,2)$ $P(E) = \frac{7}{36}$ (ii) $E = \text{favourable out come (product at most 9)}$ $= (1,1), (1,2), (1,3), (1,4), (1,5), (1,6),$ $(2,1), (2,2), (2,3), (2,4), (3,1), (3,2), (3,3),$ $(4,1), (4,2), (5,1), (6,1)$ $P(E) = \frac{17}{36}$ </p>	<p> $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$ </p>	3
<p>SECTION D</p> <p>(This section comprises of Long Answer (LA) type questions of 5 marks each)</p>			

32	$\text{TSA} = \pi Rh + \pi rh + \pi(R^2 - r^2) + 2h(R - r)$ $\frac{22}{7} \times 6 \times 7 + \frac{22}{7} \times 5 \times 7 + \frac{22}{7} (6^2 - 5^2) + 2[7(6 - 5)]$ $= 132 + 110 + \frac{22}{7} \times 11 + 14$ $= 132 + 110 + 14 + \frac{242}{7}$ $= 256 + 34.5 = 290.5 \text{ sq. cm}$	$\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$ 1+1 $\frac{1}{2}$ $\frac{1}{2}$	5
33	<p>CD is the perpendicular bisector $EF \perp CD$</p> <p>$\triangle EFG \sim \triangle AGD$</p> $\Rightarrow \frac{EF}{AD} = \frac{FG}{GD}$ <p>$\triangle EFC \sim \triangle BDC$</p> $\Rightarrow \frac{EF}{BD} = \frac{CF}{CD}$ <p>So $\frac{CF}{CD} = \frac{FG}{DG}$</p>	2 2 1	
34	<p>Let the original average speed be x km/hr</p> $\frac{36}{x} + \frac{72}{x+6} = 3$ $\Rightarrow 63(x+6) + 72x = 3x(x+6)$ $\Rightarrow 3x^2 - 117x - 378 = 0$ $\Rightarrow x^2 - 39x - 126 = 0$ $\Rightarrow (x+3)(x-42) = 0$ <p>$x = 42$ or $x = -3$</p> <p>neglecting the -ve value of x, we have $x = 42$ km/hr</p> <p>OR</p> $\frac{1}{x} + \frac{1}{x+10} = \frac{8}{75}$ $\Rightarrow 75(x+10+x) = 8x(x+10)$ $\Rightarrow 8x^2 - 70x - 750 = 0$ $\Rightarrow 4x^2 - 35x - 375 = 0$ $\Rightarrow (x-15)(4x+25) = 0$ <p>$x = 15$ or $x = -\frac{25}{4}$</p> <p>neglecting the -ve value of x, we have</p>	3 1 1 3 2	5

Time taken by other tap $15 + 10 = 25$ hours

35

5

C.I	frequency	c.f
20-30	p	p
30-40	15	p + 15
40-50	25	p + 40
50-60	20	p + 60
60-70	q	p + q + 60
70-80	8	p + q + 68
80-90	10	p + q + 78

$$p + q + 78 = 90 \text{ -----(1)}$$

$$p + q = 12$$

$$\text{median class} = 50 - 60$$

$$\text{median} = L + \frac{\frac{N}{2} - C.F}{F} \times h$$

$$L = 50, N = 90, C.F = p + 40, f = 20, h = 10$$

$$50 = 50 + \frac{45 - 40 - 9}{20} \times 10$$

$$0 = 5 - p$$

$$p = 5, q = 7$$

OR

C.I	Frequency	X_i	$u_i = \frac{(x_i - a)}{h}$	$f_i u_i$
100-120	10	110	-3	-30
120-140	15	130	-2	-30
140-160	20	150	-1	-20
160-180	22	170	0	0
180-200	18	190	1	18
200-220	12	210	2	24
220-240	13	230	3	39
				$\sum f_i u_i = 1$

$$\text{Mean} = A + \frac{\sum f_i u_i}{\sum f_i} \times h$$

$$= 170 + \frac{1}{110} \times 20$$

$$= 170 + \frac{20}{110} = 170.18(\text{approx.})$$

1

1/2
1/2
1/2
1
1
1/2

2

1/2
1/2
1/2
1
1/2

SECTION E

(This section comprises 3 case-based questions of 4 marks each)

36	<p>(i) $\tan 45^\circ = \frac{AB}{BC}$ $1 = \frac{80}{BC}$ $BC = 80\text{cm}$</p> <p>(ii) $S = \frac{D}{T}$ $\frac{20(\sqrt{3} + 1)}{2} = 10(\sqrt{3} + 1)$ $10(1.732 + 1) = 10 \times 2.73 = 27.3 \text{ m/sec}$</p> <p>(iii) (A) $\tan 30^\circ = \frac{DE}{CE}$ $\Rightarrow \frac{1}{\sqrt{3}} = \frac{80}{CE}$ $\Rightarrow CE = 80\sqrt{3}$</p> <p style="text-align: center;">$BE = CE - CB = 80\sqrt{3} - 80 = 80(\sqrt{3} - 1)$</p> <p style="text-align: center;">OR</p> <p>(iii) (B) $\tan 60^\circ = \frac{80}{DE}$</p> <p style="text-align: center;">$DE = \frac{80\sqrt{3}}{3}$</p> <p style="text-align: center;">$GB = 80 - \frac{80\sqrt{3}}{3}$</p> <p style="text-align: center;">$= 80\left(1 - \frac{1}{\sqrt{3}}\right)$</p>	1	4
37	<p>(i) (6,6)</p> <p>(ii) $\left(\frac{14}{3}, 7\right)$</p> <p>(iii) (A) $\frac{9k+3}{k+1} = 7$ Ratio is 2:1</p> <p style="text-align: center;">OR</p> <p style="text-align: center;">(B) $AB = 8, BC = 6, AC = 10$</p> <p style="text-align: center;">Yes, ABC is a right angled triangle as</p> <p style="text-align: center;">$AB^2 + BC^2 = AC^2$</p>	1 1 1 1	4
<p style="text-align: center;">(B) $AB = 8, BC = 6, AC = 10$</p> <p style="text-align: center;">Yes, ABC is a right angled triangle as</p> <p style="text-align: center;">$AB^2 + BC^2 = AC^2$</p>		$\frac{1}{2} + \frac{1}{2} + \frac{1}{2}$ $\frac{1}{2}$	

38	<p>(i) $x + y = 50$ (ii) $mx + ny = 1150$ (iii) (A) $x + y = 50, 25x + 15y = 1150$ $x = 40, y = 10$ OR (B) $x + y = 50, 50x + 5y = 1150$ $x = 20, y = 30$</p>	<p>1 1 $\frac{1}{2} + \frac{1}{2}$ 1 $\frac{1}{2} + \frac{1}{2}$ 1</p>	4
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