S.S.L.C PUBLIC EXAM MARCH/ APRIL -2025

KEY ANSWER FOR MATHEMATICS

MARKING SCHEME -KEY ANSWERS

GENERAL INSTRUCTIONS

1. If a student has given any answer which is different from one given in this marking scheme but arrives with correct answer, should be given full credit with appropriate distribution.
2. In section I, award 1 mark for the correct option code and the corresponding answer. If one of them (Option or Answer) is wrong then award ZERO mark only.
3. In section II, section III & section IV if the solution is correct then award full mark directly. The stage mark is essential only if the part of the solution is incorrect.
4. If a particular stage is wrong and if the student writes the appropriate formula then suitable mark which is attached with that stage should be awarded for the formula. Mark should not be deducted for not writing the formula, if the student arrives at the correct answer.

PART -I

Answer all the questions **14 x 1=1**

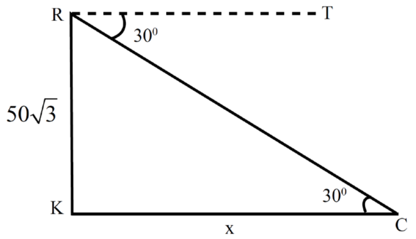
Q.No	**Option Code**	**KEY ANSWERS**	**MARKS ALLOTTED**
1.	**(c)**	$\{4,9,25,121\}$	**1**
2.	**(a)**	m^n	**1**
3.	**(c)**	$0 \leq r < b$	**1**
4.	**(a)**	0	**1**
5.	**(b)**	5	**1**
6.	**(d)**	Row matrix	**1**
7.	**(b)**	Point of contact	**1**
8.	**(d)**	$7x - 3y = 0$	**1**
9.	**(b)**	1	**1**
10.	**(d)**	60^0	**1**
11.	**(d)**	$136\,\pi\, cm^2$	**1**
12.	**(a)**	$\frac{4}{3}\pi$	**1**
13.	**(a)**	$P(A) > 1$	**1**
14.	**(d)**	$\frac{4}{5}$	**1**

Part -II

Answer any ten questions

Q.No: 28 Compulsory question **10 × 2 = 20**

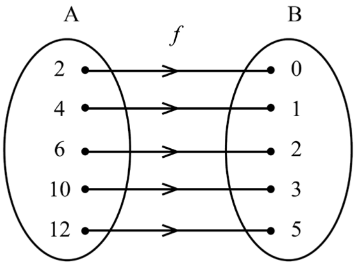
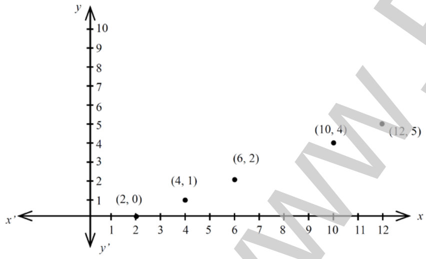
Q.No	Answers	Step Marks	Total Marks
15.	$A = \{1,2,3\}, B = \{2,3,5,7\}$ $A \times B = \{(1,2), (1,3), (1,5), (1,7), (2,2), (2,3), (2,5), (2,7), (3,2), (3,3), (3,5), (3,7)\}$	**1** **1**	**2**
16.	$fog(x) = f(g(x)) = f(x^2 - 2)$ $= 2(x^2 - 2) + 1 = 2x^2 - 3$ $gof(x) = g(f(x)) = g(2x + 1)$ $= (2x + 1)^2 - 2 = 4x^2 + 4x - 1\ fog \neq gof.$	**1** **1**	**2**
17.	$a = bq + r, 0 \leq r < \|b\|, 532 = 21q + r$ $532 = 21 \times 25 + 7$ Number of completed rows = 25 Number of flower pots left out = 7	**1** **1**	**2**
18.	$\frac{x^3}{x-y} - \frac{y^3}{x-y} = \frac{x^3 - y^3}{x-y}$ $= \frac{(x-y)(x^2 + xy + y^2)}{x-y}$ $= x^2 + xy + y^2$	**1** **1**	**2**
19.	$AB = \begin{pmatrix} 2 & 1 \\ 1 & 3 \end{pmatrix} \times \begin{pmatrix} 2 & 0 \\ 1 & 3 \end{pmatrix} = \begin{pmatrix} 4+1 & 0+3 \\ 2+3 & 0+9 \end{pmatrix} = \begin{pmatrix} 5 & 3 \\ 5 & 9 \end{pmatrix}$ $BA = \begin{pmatrix} 2 & 0 \\ 1 & 3 \end{pmatrix} \times \begin{pmatrix} 2 & 1 \\ 1 & 3 \end{pmatrix} = \begin{pmatrix} 4+0 & 2+0 \\ 2+3 & 1+9 \end{pmatrix} = \begin{pmatrix} 4 & 2 \\ 5 & 10 \end{pmatrix}$ $AB \neq BA$	**1** **1**	**2**
20.	By ABT $\frac{BD}{DC} = \frac{AB}{AC}$ $\frac{4}{3} = \frac{6}{AC} \rightarrow 4AC = 18.$ $AC = \frac{9}{2} = \mathbf{4.5\ cm}$	**1** **1**	**2**
21.	Slope of the line joining $(-2, a), (9,3) = -\frac{1}{2}$ $\Rightarrow \frac{3-a}{9+2} = \frac{-1}{2}$ $\Rightarrow \frac{3-a}{11} = \frac{-1}{2}$ $\Rightarrow 6 - 2a = -11$ $\Rightarrow 2a = 17$ $\boldsymbol{a = \frac{17}{2}}$	**1** **1**	**2**
22.	Slope of the straight line $x - 2y + 3 = 0$ is $m_1 = \frac{-1}{-2} = \frac{1}{2}$ Slope of the straight line $6x + 3y + 8 = 0$ is $m_2 = \frac{-6}{3} = -2$ $m_1 \times m_2 = \frac{1}{2} \times (-2) = -1$ Hence, the two straight lines are perpendicular.	½ ½ **1**	**2**

23.	$RK=50\sqrt{3}m$ =height of the rock $\tan 30^0=\frac{RK}{KC}$ $\frac{1}{\sqrt{3}}=\frac{50\sqrt{3}}{x}$ $\Rightarrow \boldsymbol{x=150m}$ 	**1** **1**	**2**
24.	Given $\frac{r_1}{r_2}=\frac{4}{7}$ Ratio of their volumes $=\frac{V_1}{V_2}=\frac{\frac{4}{3}\pi r_1^3}{\frac{4}{3}\pi r_2^3}=\left(\frac{r_1}{r_2}\right)^3$ $=\left(\frac{4}{7}\right)$ $=\frac{64}{343}$ Ratio of the volumes $=64:343$	**1** **1**	**2**
25.	Given that, $l=5$ cm, $R=4$ cm, $r=1$ cm C.S.A. of the frustum $=\pi(R+r)l$ sq. units $=\frac{22}{7}\times(4+1)\times 5$ $=\frac{550}{7}$ C.S.A. $=\boldsymbol{78.57cm^2}$	**1** **1**	**2**
26.	Here Largest value $L=28$ Smallest value $S=18$ Range $R=L-S$ $R=28-18=$**10 Years.**	**1** **1**	**2**
27.	Total number of flowers $n(S)=80+70+50=200$ No. of yellow flowers $n(Y)=80$. $P(Y)=\frac{n(Y)}{n(S)}=\boldsymbol{\frac{80}{200}}$ ***or*** $=\boldsymbol{\frac{2}{5}}$	**1** **1**	**2**
28.	Given sequence $\sqrt{2},\sqrt{8},\sqrt{18},\sqrt{32},\sqrt{50},\ldots$ Common Difference $t_2-t_1=\sqrt{8}-\sqrt{2}=2\sqrt{2}-\sqrt{2}=\sqrt{2}$ $t_3-t_2=\sqrt{18}-\sqrt{8}=3\sqrt{2}-2\sqrt{2}=\sqrt{2}$ $\boldsymbol{t_2-t_1=t_3-t_2}$ The Given sequence are in A.P. The Common Difference is $\boldsymbol{d=\sqrt{2}}$ **Aliter: A.P Condition $\boldsymbol{2b=a+c}$** $2\sqrt{8}=\sqrt{2}+\sqrt{18}$ $4\sqrt{2}=\sqrt{2}+3\sqrt{2}$ $\boldsymbol{4\sqrt{2}=4\sqrt{2}}$	**1** **1**	**2**

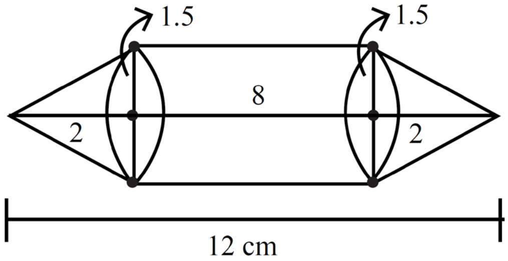
Part -III

Answer any ten questions

Q.No: 42 Compulsory question **$10 \times 5 = 50$**

<table>
<tr><th>Q.No</th><th>Answers</th><th>Step Marks</th><th>Total Marks</th></tr>
<tr><td>29.</td><td>$A = \{1,2,3,4,5,6,7\}, B = \{2,3,5,7\}, C = \{2\}$
$A \cap B = \{2,3,5,7\}$
$(A \cap B) \times C = \{(2,2), (3,2), (5,2), (7,2)\}$
$A \times C = \{(1,2), (2,2), (3,2), (4,2), (5,2) , (6, 2, (7, 2) \}$
$B \times C = \{(2,2), (3,2), (5,2), (7,2)\}$
$(A \times C) \cap (B \times C) = \{(2,2), (3,2), (5,2), (7,2)\}$</td><td>1
1
1
1
1</td><td>5</td></tr>
<tr><td>30.</td><td>$f(2) = 1 - 1 = 0, f(4) = 2 - 1 = 1, f(6) = 3 - 1 = 2,$
$f(10) = 5 - 1 = 4, f(12) = 6 - 1 = 5$
(i) Set of order pairs: $f = \{(2,0), (4,1), (6,2), (10,4), (12,5)\}$
(ii) Table:
<table><tr><td>x</td><td>2</td><td>4</td><td>6</td><td>10</td><td>12</td></tr><tr><td>$f(x)$</td><td>0</td><td>1</td><td>2</td><td>4</td><td>5</td></tr></table>(iii) Arrow diagram:

(iv) Graph:
 </td><td>2
1
1
1</td><td>5</td></tr>
<tr><td>31.</td><td>$p_1^{x_1} \times p_2^{x_2} \times p_3^{x_3} \times p_4^{x_4} = 113400$
$113400 = 2^3 \times 3^4 \times 5^2 \times 7^1$
$p_1 = 2, p_2 = 3, p_3 = 5, p_4 = 7$
$x_1 = 3, x_2 = 4, x_3 = 2, x_4 = 1$
<table><tr><td>2</td><td>113400</td></tr><tr><td>2</td><td>56700</td></tr><tr><td>2</td><td>28350</td></tr><tr><td>3</td><td>14175</td></tr><tr><td>3</td><td>4725</td></tr><tr><td>3</td><td>1575</td></tr><tr><td>3</td><td>525</td></tr><tr><td>5</td><td>175</td></tr><tr><td>5</td><td>35</td></tr><tr><td></td><td>7</td></tr></table></td><td>3
1
1</td><td>5</td></tr>
<tr><td>32.</td><td>$\sum n^2 = \frac{n(n+1)(2n+1)}{6}$
$6^2 + 7^2 + 8^2 + \cdots + 21^2$
$= (1^2 + 2^2 + 3^2 + \cdots + 21^2) - (1^2 + 2^2 + \cdots + 5^2)$
$= \frac{21 \times 22 \times 43}{6} - \frac{5 \times 6 \times 11}{6}$
$= 3311 - 55$
$= \mathbf{3256}$</td><td>1
1
1
1
1</td><td>5</td></tr>
</table>

33.	$AB = \begin{pmatrix}1 & 2 & 1\\ 2 & -1 & 1\end{pmatrix} \times \begin{pmatrix}2 & -1\\ -1 & 4\\ 0 & 2\end{pmatrix}$ $= \begin{pmatrix}2-2+0 & -1+8+2\\ 4+1+0 & -2-4+2\end{pmatrix} = \begin{pmatrix}0 & 9\\ 5 & -4\end{pmatrix}$ $(AB)^T = \begin{pmatrix}0 & 9\\ 5 & -4\end{pmatrix} = \begin{pmatrix}\mathbf{0} & \mathbf{5}\\ \mathbf{9} & \mathbf{-4}\end{pmatrix}$ $B^T = \begin{pmatrix}2 & -1 & 0\\ -1 & 4 & 2\end{pmatrix}, A^T = \begin{pmatrix}1 & 2\\ 2 & -1\\ 1 & 1\end{pmatrix}$ $B^T A^T = \begin{pmatrix}2 & -1 & 0\\ -1 & 4 & 2\end{pmatrix} = \begin{pmatrix}1 & 2\\ 2 & -1\\ 1 & 1\end{pmatrix}$ $= \begin{pmatrix}2-2+0 & 4+1+0\\ -1+8+2 & -2-4+2\end{pmatrix}$ $\boldsymbol{B^T A^T} = \begin{pmatrix}\mathbf{0} & \mathbf{5}\\ \mathbf{9} & \mathbf{-4}\end{pmatrix}$ From (1) and (2), $(AB)^T = B^T A^T$.	1 1 1 1 1	5
34.	Statement Diagram Given, To Prove, Construction Proof **[Note: If there is no figure, then mark should be allotted for statement only]**	1 1 1 2	5
35.	Area of Quadrilateral $= \frac{1}{2}\begin{vmatrix}x_1 & x_2 & x_3 & x_4 & x_1\\ y_1 & y_2 & y_3 & y_4 & y_1\end{vmatrix}$ Area of Quadrilateral $= \frac{1}{2}\begin{vmatrix}-4 & -3 & 3 & 2 & -4\\ -2 & k & -2 & 3 & -2\end{vmatrix} = 28$ $(-4k+6+9-4)-(6+3k-4-12) = 56$ $(11-4k)-(3k-10) = 56$ $21-7k = 56$ $7k = -35$ $\boldsymbol{k = -5}$	1 1 1 1 1	5
36.	If a and b are the intercepts then $a+b=7$ or $b = 7-a$ By intercept form $\frac{x}{a}+\frac{y}{b} = 1$ $\frac{x}{a}+\frac{y}{7-a} = 1$ As this line pass through the point $(-3,8)$, $\frac{-3}{a}+\frac{8}{7-a} = 1$ $-3(7-a)+8a = a(7-a)$ $a^2+4a-21 = 0$ $a = 3, a = -7$ $a = 3$ $b = 7-a = 7-3 = 4.$ $\frac{x}{3}+\frac{y}{4} = 1$ $4x+3y-12 = 0$ is the required equation.	1 1 1 1 1	5
37.	$a^3-b^3 = (a-b)(a^2+ab+b^2)$ $a^3+b^3 = (a+b)(a^2-ab+b^2)$	1	5

	$= \frac{\sin^3 A - \cos^3 A}{\sin A + \cos A} + \frac{\sin^3 A + \cos^3 A}{\sin A - \cos A}$ $= \frac{(\sin A + \cos A).(\sin^2 A - \sin A \cos A + \cos^2 A)}{\sin A + \cos A}$ $+ \frac{(\sin A - \cos A).(\sin^2 A + \sin A \cos A + \cos^2 A)}{\sin A - \cos A}$ $= (1 - \sin A \cos A) + (1 + \sin A \cos A)$ $= \mathbf{2}$	**1** **1** **1** **1**	
38.	 **Cone**: $h = 2cm\ r = 1.5$ cm $= \frac{3}{.2}$ **Cylinder:** $H = 8cm\ r = 1.5$ cm $= \frac{3}{2}$ Volume of the model $= 2$ (Vol. of Cone) $+$ Vol. of Cylinder $= \frac{2}{3}\pi r^2 h + \pi r^2 H$ $= \pi r^2 \left[\frac{2}{3}h + H\right]$ $= \frac{22}{7} \times \frac{9}{4}\left[\frac{4}{3} + 8\right]$ $= \frac{11 \times 9}{7 \times 2}\left[\frac{28}{3}\right]$ $= \frac{11 \times 3 \times 14}{7}$ $= \boldsymbol{66\ cm^3}$	**1** **1** **1** **1** **1**	**5**
39.	Here, $R = 16$ cm, $r = 2$ cm Now, n ×(Volume of a small sphere)= Volume of big metallic sphere $n \times (\frac{4}{3}\pi r^3) = \frac{4}{3}\pi R^3$ $n \times (\frac{4}{3}\pi \times 2^3) = \frac{4}{3}\pi \times 16^3$ $8n = 4096$ gives $n = 512$ Therefore, there will be 512 small spheres.	**1** **1** **1** **1** **1**	**5**
40.	**Sathya :** $\sum x_1 = 460, n = 5, \overline{x_1} = \frac{460}{5} = 92, \sigma_1 = 4.6$ **Vidhya**: $\sum x_2 = 480, n = 5, \overline{x_2} = \frac{480}{5} = 96, \sigma_2 = 2.4$ $C.V_1 = \frac{\sigma_1}{x_1} \times 100$ $= \frac{4.6}{92} \times 100$ $= \frac{460}{92}$ $= 5$ $C.V_2 = \frac{\sigma_2}{x_2} \times 100$ $= \frac{2.4}{96} \times 100$	**1** **1** **1** **1**	**5**

	$= \frac{240}{96}$ $= 2.5$ $C.V_2 < C.V_1$ Vidhya is more consistent than Sathya	1	
41.	$S = \{5 \text{ Red}, 6 \text{ White}, 7 \text{ Green}, 8 \text{ Blue}\}, \boldsymbol{n(s) = 26}$ i) Let A-White ball $n(A) = 6$ $P(A) = \frac{6}{26} = \frac{3}{13}$ ii) Let B -Black (or) red $n(B) = 5 + 8 = 13$ $P(B) = \frac{13}{26} = \frac{1}{2}$ iii) Let C -not white $n(C) = 20$ $P(C) = \frac{20}{26} = \frac{10}{13}$ iv) Let D -Neither white nor black $n(D) = 12$ $P(D) = \frac{12}{26} = \frac{6}{13}$	1 1 1 1 1	5
42.	$(x-1)^2 + (x-2)^2 + (x-3)^2 = 0$ $x^2 - 2x + 1 + x^2 - 4x + 4 + x^2 - 6x + 9 = 0$ $3x^2 - 12x + 14 = 0$ $a = 3, b = -12, c + 14$ $\Delta = b^2 - 4ac$ $= (-12)^2 - 4 \times 3 \times 14$ $= 144 - 168$ $= -24 < 0$ $\Delta < 0$ No Real Roots	1 1 1 1 1	5

Part -IV

Answer all the questions $2 \times 8 = 16$

Q.No	Answers	Step Marks	Total Marks
43. (a)	Rough diagram Drawing line segment Drawing Circle Marking Bisector Construction of $\Delta\ PQR$	1 1 3 1 2	8
	(OR)		
(b)	Rough diagram Drawing the first circle	1 2	8

<table>
<tr><td></td><td>Drawing the line segment of 11 cm</td><td>1</td><td></td></tr>
<tr><td></td><td>Drawing the second circle</td><td>2</td><td></td></tr>
<tr><td></td><td>Drawing the two tangents</td><td>1</td><td></td></tr>
<tr><td></td><td>Length of a tangent $= 10.2\ cm\ or\ 10.3\ cm\ or\ 10.4\ cm$</td><td>1</td><td></td></tr>
<tr><td>44. (a)</td><td>X axis, Y axis</td><td>1</td><td rowspan="5">8</td></tr>
<tr><td></td><td>Scale</td><td>1</td></tr>
<tr><td></td><td>$y = x^2 - 9x + 20$
<table>
<tr><td>x</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr>
<tr><td>y</td><td>12</td><td>6</td><td>2</td><td>0</td><td>0</td><td>2</td><td>6</td><td>12</td></tr>
</table></td><td>3</td></tr>
<tr><td></td><td>Plot the points and drawing curve</td><td>2</td></tr>
<tr><td></td><td>Solution Real and Unequal roots</td><td>1</td></tr>
<tr><td></td><td>(OR)</td><td></td><td></td></tr>
<tr><td>(b)</td><td>X axis, Y axis</td><td>1</td><td rowspan="7">8</td></tr>
<tr><td></td><td>Scale</td><td>1</td></tr>
<tr><td></td><td>
<table>
<tr><td>Time (Min)</td><td>60</td><td>120</td><td>180</td><td>240</td><td>300</td></tr>
<tr><td>Distance (km)</td><td>50</td><td>100</td><td>150</td><td>200</td><td>250</td></tr>
</table>
(OR)
<table>
<tr><td>Time (Hr)</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td>Distance (km)</td><td>50</td><td>100</td><td>150</td><td>200</td><td>250</td></tr>
</table></td><td>2</td></tr>
<tr><td></td><td>Plot the Points and drawing the straight line</td><td>1</td></tr>
<tr><td></td><td>(i) $k = \frac{5}{6}\ or\ k = 5$</td><td>1</td></tr>
<tr><td></td><td>(ii) From the graph, A bus Travelled 90 min or 1 ½ hrs distance is 75 km.</td><td>1</td></tr>
<tr><td></td><td>(iii) From the graph, A bus Cover a distance of 300 km is the time required 360 min or 6 hrs.</td><td>1</td></tr>
</table>

PREPARED AND TYPED BY

Y.SEENIVASAN. M.SC, B.ED

MATHS TEACHER – 8489880553

****