



SSLC MODEL EXAMINATION
KEY FOR MATHS
PART - I

SECTION - A

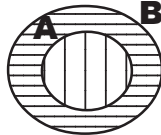
15 x 1 = 15 Marks

Q. No.	Key	Answer	Q. No.	Key	Answer				
1.	b	10	8.	c)	-3, 2				
2.	b	an A.P.	9.	b)	4 : 9				
3.	a	$\frac{n}{2} [1 - 5n]$	10.	b)	16 cm				
4.	a	a = c	11.	b)	$\tan^2 \theta$				
5.	b	k \neq 3	12.	b)	$2\cos^2 x - 1$				
6.	d	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>4</td><td>-2</td></tr><tr><td>6</td><td>-3</td></tr></table>	4	-2	6	-3	13.	d)	$8\pi \text{ cm}^2$
4	-2								
6	-3								
7.	a	0^0	14.	d)	0				
			15.	a)	1				

SECTION - B

10 x 2 = 20 Marks

16. $A \cup B = B$



- 2 marks

17. (i) the element 2 in c has two images namely 20 and 40

- 1 mark

(ii) It is not a function

- 1 mark

18. $\sum n^3 = \left(\frac{n(n+1)}{2} \right)^2$

- 1 mark

$$1^3 + 2^3 + 3^3 + \dots + 20^3 = \left(\frac{20 \times 21}{2} \right)^2$$

$$= 44100$$

- 1 mark

19. $\frac{x^2 - 81}{x^2 - 4} \times \frac{x^2 + 6x + 8}{x^2 - 5x - 36} = \frac{(x+9)(x-9)}{(x+2)(x-2)} \times \frac{(x+4)(x+2)}{(x-9)(x+4)}$

- 1 mark

$$= \frac{x+9}{x-2}$$

- 1 mark

20. $\left. \begin{array}{l} \alpha + \beta = 6 \\ \alpha \beta = 2 \end{array} \right\}$

- 1 mark

the required equation is $x^2 - 6x + 2 = 0$

- 1 mark

$$21. \quad 6A - 3B = 6 \begin{bmatrix} 4 & -2 \\ 5 & -9 \end{bmatrix} - 3 \begin{bmatrix} 8 & 2 \\ -1 & -3 \end{bmatrix}$$

- 1 mark

$$= \begin{bmatrix} 0 & -18 \\ 33 & -45 \end{bmatrix}$$

- 1 mark

$$22. \quad A = \begin{pmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \end{pmatrix}$$

- 1 mark

$$A = \begin{pmatrix} 1 & 4 & 7 \\ 1 & 2 & 5 \end{pmatrix}$$

- 1 mark

$$23. \quad a = \frac{-2}{7}, \quad b = \frac{2}{3}$$

$$\frac{x}{a} + \frac{y}{b} = 1$$

- 1 mark

$$7x - 3y + 2 = 0$$

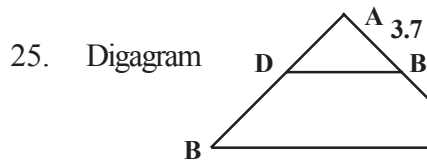
- 1 mark

$$24. \quad \text{Centroid} = \left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3} \right)$$

- 1 mark

$$= (2, -1)$$

- 1 mark



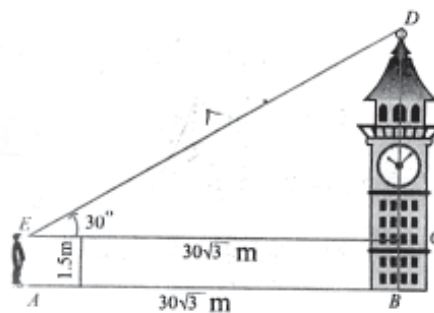
- 1 mark

$$EC = \frac{3.7 \times 3}{2} = 5.55 \text{ cm}$$

- 1 mark

26. Diagram

- 1 mark



$$CD = 30 \text{ m}$$

$$\text{height, } BD = BC + CD$$

$$= 1.5 + 30 = 31.5 \text{ cm}$$

- 1 mark

27. given $\frac{1}{3} \pi r^2 h = 120 \pi$, $h = 10$ cm - 1 mark

$$r = 6, l = \sqrt{136} = 11.66, \text{CSA} = \pi r l$$

$$\text{CSA} = 219.67 \text{ (or) [equivalent answer]} \quad \text{- 1 mark}$$

28. $V = \frac{4}{3} \pi (R^3 - r^3)$ - 1 mark

$$V = 3050 \frac{2}{3} \text{cm}^3 \quad \text{- 1 mark}$$

29. $\sigma = \sqrt{\frac{n^2-1}{12}}$ - 1 mark

$$\sigma = \sqrt{\frac{100-1}{12}} = 2.87 \quad \text{- 1 mark}$$

30. a) By given, $\frac{x}{5+x} = 3 \left(\frac{5}{5+x} \right)$ - 1 mark

$$x = 15 \quad \text{- 1 mark}$$

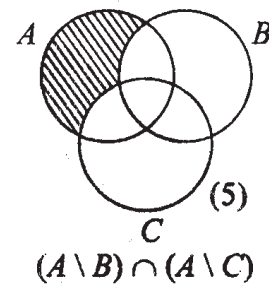
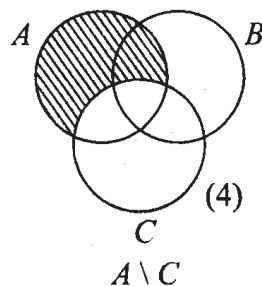
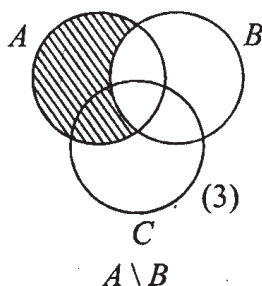
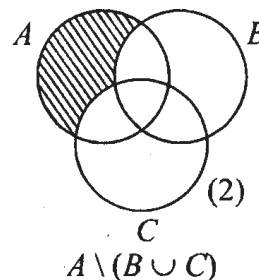
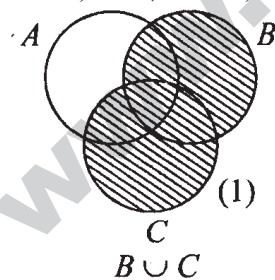
b) $\sqrt{\frac{1 - \sin \theta}{1 + \sin \theta}} = \frac{1 - \sin \theta}{\cos \theta}$ - 1 mark

$$= \sec \theta - \tan \theta \quad \text{- 1 mark}$$

SECTION - C

31. Each Diagram carries - 1 mark - 5 marks

$$A \setminus (B \cup C) = (A \setminus B) \cap (A \setminus C)$$



From (2) and (5), we get $A \setminus (B \cup C) = (A \setminus B) \cap (A \setminus C)$,

32. (i) $f(5) = 65$ mathstimes.com - 1 mark
(ii) $f(3) = 5$ - 1 mark
(iii) $f(1) = 2$ - 1 mark
(iv) $f(2) - f(4) = -35$ - 1 mark
(v) $2f(5) - 3f(1) = 124$ - 1 mark
-

33. $S_n = 6 (1 + 11 + 111 + \dots \text{to } n \text{ terms})$ - 1 mark
 $= \frac{6}{9} (9 + 99 + 999 + \dots \text{to } n \text{ terms})$ - 1 mark
 $= \frac{2}{3} [(10 - 1) + (100 - 1) + (1000 - 1) + \dots \text{to } n \text{ terms}]$ - 1 mark
 $= \frac{2}{3} [(10 + 10^2 + 10^3 + \dots \text{to } n \text{ terms}) - n]$ - 1 mark
 $S_n = \frac{2}{3} \left(\frac{10(10^n - 1)}{9} - n \right)$ - 1 mark
-

34. $\frac{a}{r}, a, ar$ - 1 mark
 $a = -1$ - 1 mark
 $r = \frac{-4}{3}$ (or) $\frac{-3}{4}$ - 2 marks
terms are $\frac{3}{4}, -1, \frac{4}{3}$ - 1 mark
(or) $\frac{4}{3}, -1, \frac{3}{4}$
-

35. $x^3 - 2x^2 - 5x + 6$
- | | | | | |
|---|---|----|----|----|
| 1 | 1 | -2 | -5 | 6 |
| | 0 | 1 | -1 | -6 |
| | 1 | -1 | -6 | 0 |
- 2 marks

$(x - 1)$ is a factor (any first factor)

$(x^2 - x - 6) = (x + 2)(x - 3)$ - 2 marks

$x^3 - 2x^2 - 5x + 6 = (x - 1)(x + 2)(x - 3)$

(OR)

Factors are $(x - 1)(x + 2)(x - 3)$ - 1 mark

36.

$$5x^2 - 3x - 2$$

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$$\begin{array}{r}
 5x^2 \overline{) 25x^4 - 30x^3 - 11x^2 + ax - b} \\
 \underline{25x^4} \\
 -30x^3 - 11x^2 \\
 \underline{-30x^3 + 9x^2} \\
 -20x^2 + ax - b \\
 \underline{-20x^2 + 12x + 4} \\
 0
 \end{array}$$

- 2 marks

$$10x^2 - 3x$$

- 1 mark

$$10x^2 - 6x - 2$$

- 1 mark

$$a = 12, \quad b = -4$$

- 1 mark

$$37. \quad A + B = \begin{bmatrix} 11 & 10 \\ 7 & 15 \end{bmatrix}$$

- 1 mark

$$(A + B)C = \begin{bmatrix} 62 & 27 \\ 74 & 69 \end{bmatrix}$$

- 1 mark

$$AC = \begin{bmatrix} 18 & 9 \\ 38 & 15 \end{bmatrix}$$

- 1 mark

$$BC = \begin{bmatrix} 44 & 18 \\ 36 & 54 \end{bmatrix}$$

- 1 mark

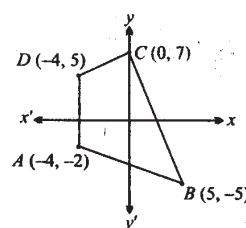
$$AC + BC = \begin{bmatrix} 62 & 27 \\ 74 & 69 \end{bmatrix}$$

- 1 mark

$$A(B + C) = AC + BC$$

38. Area of Quadrilateral ABCD

$$= \frac{1}{2} \left\{ \begin{array}{cccc} -4 & 5 & 0 & -4 \\ -2 & -5 & 7 & -2 \end{array} \right\}$$



- 2 marks

$$= \frac{1}{2} \{ (20 + 35 + 0 + 8) - (-10 + 0 - 28 - 20) \}$$

- 2 marks

$$= \frac{1}{2} \{ 63 + 58 \} = 60.5 \text{ Sq. units}$$

- 1 mark

$$39. \quad \text{Slope of BC} = \frac{11+1}{4-6} = -6$$

- 1 mark

$$\text{Slope of AD} = \frac{1}{6}$$

- 1 mark

Equation of AD is

$$y - y_1 = m(x - x_1)$$

- 1 mark

$$y - 1 = \frac{1}{6}(x - 2) \Rightarrow 6y - 6 = x - 2$$

- 1 mark

the required straight line is

$$x - 6y + 4 = 0$$

- 1 mark

40. Statement

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- 1 mark

Diagram (without diagram, no mark award)

- 1 mark

given, to prove, construction

- 1 mark

Proof

- 2 marks

41. Diagram

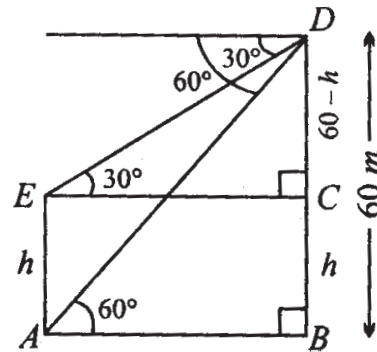
$$\tan 60 = \frac{BD}{AB}$$

$$AB = \frac{60}{\sqrt{3}}$$

$$\tan 30 = \frac{CD}{EC}$$

$$AB = (60 - h)\sqrt{3}$$

$$h = 40 \text{ m}$$



- 1 mark

- 1 mark

- 1 mark

- 1 mark

- 1 mark

42.

Sphere	Cone
$d = 42 \text{ cm}$	$d = 7 \text{ cm}, r = \frac{7}{2} \text{ cm}$
$r = 21$	$h = 3 \text{ cm}$

- 1 mark

$$\text{The required number of cones} = \frac{\frac{4}{3} \pi r^3}{\frac{1}{3} \pi r^2 h}$$

- 2 marks

$$= \frac{\frac{4}{3} \times \pi \times 21 \times 21 \times 21}{\frac{1}{3} \pi \times \frac{7}{2} \times \frac{7}{2} \times 3}$$

$$= 1008$$

- 1 mark

- 1 mark

43.

x	$d = x - 4$	d^2
x	$= x - 55$	
50	-5	25
52	-3	9
53	-2	4
55	0	0
58	3	9
62	7	49
63	8	64
	$\Sigma d = 8$	$\Sigma d^2 = 160$

- 2 marks

$$\begin{aligned}\sigma &= \sqrt{\frac{\sum d^2}{n} - \left(\frac{\sum d}{n}\right)^2} \\ &= \sqrt{\frac{160}{7} - \left(\frac{8}{7}\right)^2} \\ &= \sqrt{\frac{1056}{49}}\end{aligned}$$

- 1 mark

$$\sigma \approx 4.64$$

- 2 marks

44. $P(A) = 0.16$, $P(B) = 0.24$, $P(A \cap B) = 0.11$

(i) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

- 1 mark

$$= 0.16 + 0.24 - 0.11$$

$$= 0.29$$

- 2 marks

ii) $P(A \cap B) + P(A \cap B) = [P(A) - P(A \cap B)] + [P(B) - P(A \cap B)]$

$$= (0.16 - 0.11) + (0.24 - 0.11)$$

$$= 0.18$$

- 2 marks

45. a) $a = 5$, $b = -p$, $c = 1$

- 1 mark

$$\alpha + \beta = \frac{-b}{a} = \frac{p}{5}$$

$$\alpha \beta = \frac{1}{5}$$

- 1 mark

$$\alpha - \beta = 1$$

$$(\alpha + \beta)^2 - 4\alpha\beta = (\alpha - \beta)^2$$

$$\frac{p^2}{25} - \frac{4}{5} = 1$$

$$p^2 = 45$$

- 2 marks

$$p = + 3\sqrt{5}$$

- 1 marks

b) Cylindrical shaped well :

$$2r = 14\text{m}$$

$$r = 7\text{ m}$$

- 1 mark

$$h = 20\text{m}$$

Cuboid plat form :

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$$l = 20 \text{ m} , b = 14 \text{ m}$$

- 1 mark

$$l b h_1 = \pi r^2 h$$

$$20 \times 14 \times h_1 = \frac{22}{7} \times 7 \times 7 \times 20$$

- 2 marks

$$h_1 = 11 \text{ m}$$

- 1 mark

SECTION - D

46) (a) Rough Diagram

- 1 mark

Draw a circle

- 2 marks

Mark a point P

- 1 mark

Draw a perpendicular bisector

- 2 marks

Draw another circle

- 1 mark

To draw two tangents PA and PB

- 2 marks

Length 12 cm

- 1 mark

(b) Rough Diagram

- 1 mark

Draw a line segment AB

- 1 mark

Draw arcs with radii 4.8 cm and 8 cm

- 2 marks

Draw the perpendicular bisectors

- 2 marks

Draw the circumcircle of $\triangle ABD$

- 2 marks

Draw an arc at C, join BC and CD

- 2 marks

47) (a) Form a Equation

- 1 mark

Plotting the points and drawing the line

- 5 marks

Scale, x - axis, y -axis

- 2 marks

Solution se (i) 24 hours

- 1 mark

(ii) 3 km / hr

- 1 mark

(b)

x	-3	-2	-1	0	1	2	3
y	9	0	-5	-6	-3	4	15

Tabular column (any 5 points)

- 4 marks

Scale, x - axis, y - axis

- 2 marks

Plotting the points

- 3 marks

Solution set { -2.5 , 2 }

- 1 mark