

DIRECTORATE OF GOVERNMENT EXAMINATIONS

CHENNAI-6

SSLC EXAMINATIONS, MARCH/APRIL 2016

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 correct answer should be given full credit with appropriate distribution.
2. In section I award 1 mark for the correct option or the corresponding answer or both. If one of them (option or answer) is wrong the 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.

Directorate of Government Examinations, Chennai - 6
SSLC Common Examinations – March / April 2016

Mathematics – Answer Key

Total Marks : 100

Section - I

(Marks : 15)

Choose the correct Answer :		15 x 1 = 15
1.	(a)	{ p , q }
2.	(d)	21
3.	(a)	k^2
4.	(a)	has infinitely many solutions
5.	(b)	$\frac{b^2}{4a}$
6.	(d)	$\begin{pmatrix} 4 & -2 \\ 6 & -3 \end{pmatrix}$
7.	(b)	$x + 2 = 0$
8.	(a)	$3x - y - 4 = 0$
9.	(b)	4.5 cm
10.	(d)	4 cm
11.	(c)	$\tan^2\theta$
12.	(d)	75 m
13.	(d)	$3\pi \text{ cm}^2$
14.	(c)	t
15.	(d)	$\frac{3}{4}$

Section - II (Marks : 20)

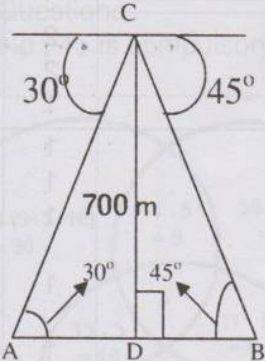
(i) Answer 10 Questions .			
(ii) Question No : 30 is compulsory. Select any 9 questions from the first 14 questions.			10 x 2 = 20
16.	AUB = {a,x,y,r,s,1,3,5,7,-10} BUA = {1,3,5,7,-10,a,x,y,r,s}	1 1	2 Marks
17.	f = {(5,-7),(6,-9),(7,-11),(8,-13)} range = {-7,-9,-11,-13}	1 1	2 Marks
18.	$t_n = a+(n-1)d$ (or) $t_{12} = a+11d$ $t_{12} = 23\sqrt{2}$	1 1	2 Marks
19.	$\frac{x^3}{x-2} - \frac{8}{x-2}$ $x^2 + 2x + 4$	1 1	2 Marks
20.	$\alpha + \beta = -b/a = +2$ $\alpha\beta = c/a = 4/3$ $\alpha^2 + \beta^2 = 4/3$	1 1	2 Marks
21.	$\begin{pmatrix} 8-54+6 & 4+63-3 \\ 16+6+0 & 8-7+0 \end{pmatrix}$ $\begin{pmatrix} -40 & 64 \\ 22 & 1 \end{pmatrix}$	1 1	2 Marks
22.	$z = 5$ $y = 4, x = 3$	1 1	2 Marks
23.	centroid = $\left(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3} \right)$ third vertex = (2, -2)	1 1	2 Marks
24.	$m_1 = \frac{5}{2}$ $m_2 = \frac{-2}{a}$ $a = 5$ (Note : alternative method can be used)	1 1	2 Marks
25.	$\angle TAB = 72^\circ$ $\angle ABI = 65^\circ$	1 1	2 Marks
26.	$\cos(A+B) = \cos 90^\circ = 0$ $\sin(A+B) = \sin 90^\circ = 1$	1 1	2 Marks
27.	$h = 40$ cm $d = 2r = 35$ cm	1 1	2 Marks
28.	$cv = \frac{\sigma}{\bar{x}} \times 100$ $\bar{x} = 12$	1 1	2 Marks

29.	probability of getting a multiple of 4 = $\frac{5}{20}$	1	2 Marks
	probability of not getting a multiple of 6 = $\frac{17}{20}$	1	
30.	$2\pi R = \frac{\theta}{360} \times 2\pi r$	1	2 Marks
	(a) $R = \frac{21}{2}$ cm (or) 10.5 cm (Note : alternative method can be used)	1	
	(OR)		
	(b) $\text{LHS} = \frac{\cos \theta + 1}{1 - \cos \theta} = \frac{1 + \cos \theta}{1 - \cos \theta} = \frac{1 + \cos \theta}{1 - \cos \theta} \times \frac{1 + \cos \theta}{1 + \cos \theta} = \frac{1 + 2\cos \theta + \cos^2 \theta}{1 - \cos^2 \theta} = \frac{1 + 2\cos \theta + \cos^2 \theta}{\sin^2 \theta} = \frac{(1 + \cos \theta)^2}{\sin^2 \theta} = \frac{(1 + \cos \theta)^2}{1 - \cos^2 \theta} = \frac{(1 + \cos \theta)^2}{(1 - \cos \theta)(1 + \cos \theta)} = \frac{1 + \cos \theta}{1 - \cos \theta} = \text{RHS}$ (Note : alternative method can be used)	1	

Section – III (Marks : 45)

(i) Answer 9 Questions . (ii) Question No : 45 is compulsory. Select 8 questions from the first 14 questions .		9 x 5 = 45
31.		2
	(i) No. of Students who didn't like any of the three types = $190 - 170 = 20$	1
	(ii) No. of Students who liked any two types only = $9 + 6 + 10 = 25$	1
	(iii) No. of Students who liked folk but not rock = $30 + 6 = 36$	1
32.	$f(-2) = 15 ; f(4) = 10$	1
	$f(-2) - f(4) = 15 - 10 = 5$	1
	$f(3) = 7 ; f(-1) = 3$ $f(6) = 9 ; f(1) = 3$ }	2
	$\frac{f(3) + f(-1)}{2f(6) - f(1)} = \frac{10}{15} \text{ (or) } \frac{2}{3}$	1

33.	$S_n = 7(1 + 11 + 111 + \dots \text{ n terms})$ $= \frac{7}{9}(9 + 99 + 999 + \dots \text{ n terms})$ $= \frac{7}{9}[(10 - 1) + (100 - 1) + (1000 - 1) + \dots \text{ n terms}]$ $= \frac{7}{9} [(10 + 10^2 + 10^3 + \dots \text{ n terms}) - n]$ $= \frac{7}{9} \left[\frac{10(10^n - 1)}{9} - n \right]$ <p>(or) $\frac{70}{81}(10^n - 1) - \frac{7n}{9}$</p>	1 1 1 1 1	5 Marks
34.	$7t_7 = 11t_{11}$ $7a + 42d = 11a + 110d$ $a + 17d = 0$ $t_{18} = 0$ <p>Not possible.</p>	1 1 1 1 1	5 Marks
35.	<p>First factor</p> <p>Second factor and Third factor</p> <p>Factors are $(x + 2)(x - 3)(x - 4)$</p>	2 2 1	5 Marks
36.	$x^2 + 3x + 2 = (x + 1)(x + 2)$ $x^2 + 5x + 6 = (x + 2)(x + 3)$ $x^2 + 4x + 3 = (x + 3)(x + 1)$ $= \frac{x + 3 + x + 1 - 2(x + 2)}{(x + 1)(x + 2)(x + 3)}$ $= 0$	1 1 1 1 1	5 Marks
37.	$B+C = \begin{pmatrix} -1 & 6 \\ 1 & 10 \end{pmatrix}$ $A(B+C) = \begin{pmatrix} -1 & 38 \\ 5 & 34 \end{pmatrix}$ $AB = \begin{pmatrix} 6 & 29 \\ 26 & 23 \end{pmatrix}$ $AC = \begin{pmatrix} -7 & 9 \\ -21 & 11 \end{pmatrix}$ $AB + AC = \begin{pmatrix} -1 & 38 \\ 5 & 34 \end{pmatrix}$	1 1 1 1 1	5 Marks

38.	<p>Area of the quadrilateral ABCD</p> $= \frac{1}{2} \begin{vmatrix} -4 & 5 & 0 & -4 & -4 \\ -2 & -5 & 7 & 5 & -2 \end{vmatrix}$ $= \frac{1}{2} \{ (+20 + 35 + 0 + 8) - (-10 - 0 - 28 - 20) \}$ $= \frac{1}{2} (63 + 58)$ $= 60.5 \text{ Sq.units}$ <p>(Note : alternative method can be used)</p>	2 1 1 1	5 Marks
39.	<p>Statement diagram Given, To prove and Construction proof Note : Without diagram give 1 marks only for statement</p>	1 1 1 2	5 Marks
40.		1	5 Marks
	<p>$AD = 700\sqrt{3} \text{ m}$ $BD = 700 \text{ m}$ Width of the River $AB = AD + DB$ $= 700\sqrt{3} + 700 = 700(\sqrt{3} + 1)$ $= 1912.4 \text{ m}$</p>	1 1 1 1	
41.	<p>capacity of the bucket $V = \frac{1}{3} \pi h (R^2 + r^2 + Rr) \text{ cu. units}$ $= \frac{1}{3} \times \frac{22}{7} \times 63 \times (15^2 + 8^2 + 15 \times 8)$ $= 26994 \text{ cm}^3$ $= 26.994 \text{ litres}$</p>	1 1 2 1	5 Marks
42.	<p>$l = 35 \text{ m}$ Total Surface Area $= 2\pi rh + \pi rl \text{ sq. units}$ $= 5082 \text{ sq.metre}$ the cost of the canvas = Rs. 63525</p>	1 1 2 1	5 Marks

Section - IV

(Marks : 20)

Note : Answer both the questions choosing either of the alternatives.		2 x 10 = 20																	
46.	Rough diagram	2	10 Marks																
	First Circle	2																	
	Line Segment OP	1																	
	Perpendicular bisector	1																	
	(a) Second Circle	2																	
	Two tangents	1																	
	Length of Tangents = 8.5 c.m (OR) 8.4 c.m (OR) 8.6 c.m	1																	
	(OR)																		
	Rough Diagram	2																	
	Line Segment PQ	1																	
	Triangle PQR	3																	
	Perpendicular bisector	1																	
	Circumcircle	2																	
	Cyclic Quadrilateral PQRS	1																	
47.	x- axis, y- axis, scale	2	10 Marks																
	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>x</td> <td>-3</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>y</td> <td>0</td> <td>-3</td> <td>-4</td> <td>-3</td> <td>0</td> <td>5</td> <td>12</td> </tr> </table>	x		-3	-2	-1	0	1	2	3	y	0	-3	-4	-3	0	5	12	2
	x	-3		-2	-1	0	1	2	3										
	y	0		-3	-4	-3	0	5	12										
	(a) First table (any five points)																		
	Draw parabola	2																	
	Second Part mere attempt	4																	
	(OR)																		
	x- axis, y- axis	1																	
	scale	1																	
(b) Plot the points	4																		
Draw the curve	3																		
24 days are taken by 12 workers to complete the work.	1																		