ಕರ್ನಾಟಕ ಪ್ರೌಢ ಶಿಕ್ಷಣ ಪರೀಕ್ಷಾ ಮಂಡಳಿ, ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು – 560 003

KARNATAKA SECONDARY EDUCATION EXAMINATION BOARD, MALLESWARAM, BANGALORE – 560 003

ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪರೀಕ್ಷೆ, ಮಾರ್ಚ್ /ಏಪ್ರಿಲ್ — 2009

S. S. L. C. EXAMINATION, MARCH/APRIL – 2009

ಮಾದರಿ ಉತ್ತರಗಳು

MODEL ANSWERS

ದಿನಾಂಕ : 31. 03. 2009 ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

Date : 31. 03. 2009 **CODE NO. : 81-E**

ವಿಷಯ : **ಗಣಿತ**

Subject : MATHEMATICS

[ಪರಮಾವಧಿ ಅಂಕಗಳು : **100**

[Max. Marks : 100

(English Version)

Qn. Nos.	Letter of the answer	Value Points	Marks Allotted
		Part – A	
1.	B	$B - A$	1
2.	C	$P \cup (Q \cap R)$	1
3.	D	$\{ 1, 4, 6 \}$	1
4.	A	21	1
5.	D	ϕ	1
6.	C	3	1
7.	A	3	1
8.	B	64	1
9.	B	$\frac{2PQ}{P + Q}$	1
10.	D	3	1
11.	C	$\begin{bmatrix} 2 & 3 \\ 5 & 6 \end{bmatrix}$	1
12.	A	$2n$	1

[Turn over

Qn. Nos.	Letter of the answer	Value Points	Marks Allotted
13.	D	190	1
14.	D	6	1
15.	A	${}^{n}P_{r} = {}^{n}C_{r} \times \lfloor r$	1
16.	B	${}^{4}P_{4}$	1
17.	A	0·81	1
18.	B	are equal to each other	1
19.	D	Ragi	1
20.	C	1	1
21.	B	$2x + 2y + 2z$	1
22.	D	0	1
23.	A	$a^3 + b^3$	1
24.	C	$18abc$	1
25.	C	n and x	1
26.	D	$9\sqrt{2}$	1
27.	B	$\sqrt{p - q}$	1
28.	A	$3\sqrt{x} + 3\sqrt{y}$	1
29.	D	$2x^2 = 16$	1
30.	B	linear equation	1
31.	C	$\sqrt{\frac{Fr}{m}}$	1
32.	A	$\frac{7}{2}$	1
33.	B	$\frac{-q \pm \sqrt{q^2 - 4pr}}{2p}$	1
34.	D	$(x + 4)x - 60 = 0$	1
35.	A	$b^2 - 4ac$	1

Qn. Nos.	Letter of the answer	Value Points	Marks Allotted	
36.	C	0	1	
37.	B	10	1	
38.	A	$x^2 + 5x + 4 = 0$	1	
39.	C	35	1	
40.	B	– 4	1	
41.	D	m	1	
42.	C	6	1	
43.	B	11	1	
44.	A	$4x$ units	1	
45.	C	Acute angle	1	
46.	D	All the equilateral triangles are similar	1	
47.	B	$\frac{AP}{PC} = \frac{BQ}{QC}$	1	
48.	A	16 : 1	1	
49.	C	$\frac{QP}{BC}$	1	
50.	D	90°, 60°	1	
51.	B	intersecting circles	1	
52.	A	8 cm	1	
53.	C	($x - y$) cm	1	
54.	D	$2 \pi r (r + h)$	1	
55.	B	1	1	
56.	A	8 : 27	1	
57.	B	9 cm	1	
58.	D	7 cm	1	
59.	A	4, 6	1	
60.	C	4, 2.	1	

Qn. Nos.	Value Points	Marks Allotted	
	Part – B		
61.	$a = 1000, \quad n = 12 \times 2 = 24, \quad d = 60$		
	$S_n = \frac{n}{2} [2a + (n - 1) d]$	$\frac{1}{2}$	
	$= \frac{24}{2} [2 \times 1000 + (24 - 1) 60]$	$\frac{1}{2}$	
	$= 12 [2000 + 23 \times 60]$	$\frac{1}{2}$	
	$= 12 \times [2000 + 1380]$		
	= Rs. 40,560.	$\frac{1}{2}$	2
	Or 2nd method :		
	$T_n = 1000 + (24 - 1) 60$	$\frac{1}{2}$	
	$= 1000 + 23 \times 60$		
	$= 1000 + 1380$		
	$T_{24} =$ 2,380 Rs.	$\frac{1}{2}$	
	Now, $S_{24} = \frac{n}{2} (a + l)$		
	$= \frac{24}{2} (1000 + 2380)$	$\frac{1}{2}$	
	$= 12 \times 3380$		
	= Rs. 40,560.	$\frac{1}{2}$	2
62.	$A = \begin{bmatrix} 2 & 3 \\ 5 & 1 \end{bmatrix} \quad \therefore \ A' = \begin{bmatrix} 2 & 5 \\ 3 & 1 \end{bmatrix}$	$\frac{1}{2}$	
	$AA' = \begin{bmatrix} 2 & 3 \\ 5 & 1 \end{bmatrix} \times \begin{bmatrix} 2 & 5 \\ 3 & 1 \end{bmatrix}$	$\frac{1}{2}$	
	$= \begin{bmatrix} 4 + 9 & 10 + 3 \\ 10 + 3 & 25 + 1 \end{bmatrix}$	$\frac{1}{2}$	
	$= \begin{bmatrix} 13 & 13 \\ 13 & 26 \end{bmatrix}$.	$\frac{1}{2}$	2

Qn. Nos.	Value Points	Marks Allotted	
63.	Mean given $\left(\overline{X} \right) = 15$		

Scores	***d***	d^2
10	– 5	25
12	– 3	9
14	– 1	1
16	1	1
18	3	9
20	5	25
		$\sum d^2 = 70$

1

Standard deviation (σ) = $\sqrt{\frac{\sum d^2}{N}}$ $\frac{1}{2}$

$= \sqrt{\frac{70}{6}}$

$= \sqrt{11{\cdot}66} = 3{\cdot}4.$ $\frac{1}{2}$ 2

64. $a + b + c = 0$

LHS $= (b + c)(b - c) + a(a + 2b)$

$= b^2 - c^2 + a^2 + 2ab$ $\frac{1}{2}$

$= (a + b)^2 - c^2$ $\frac{1}{2}$

$= (a + b + c)(a + b - c)$ $\frac{1}{2}$

$= (0)\ (a + b - c)$ $\frac{1}{2}$ 2

$= 0.$

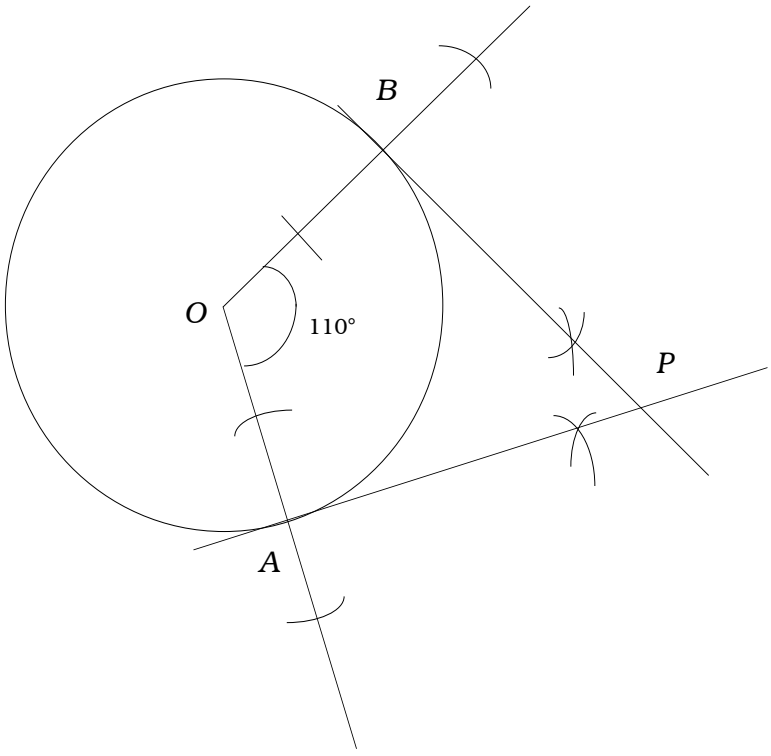
65. $\frac{(\sqrt{5} + \sqrt{3})}{(\sqrt{5} - \sqrt{3})} \frac{(\sqrt{5} + \sqrt{3})}{(\sqrt{5} + \sqrt{3})}$ $\frac{1}{2}$

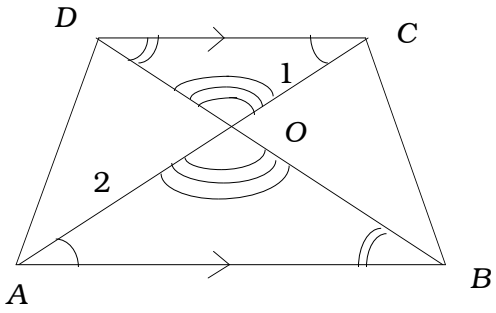
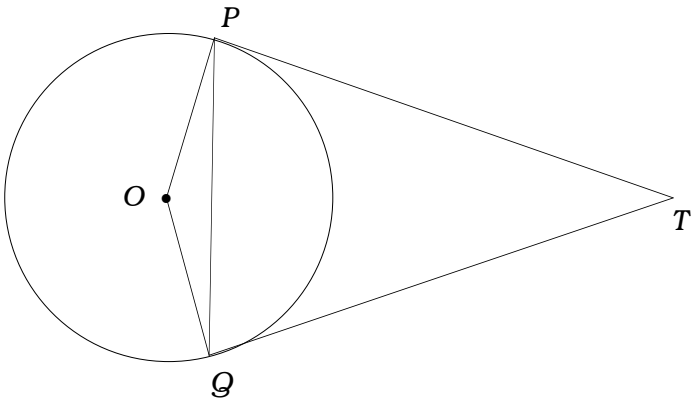
$= \frac{(\sqrt{5})^2 + (\sqrt{3})^2 + 2\sqrt{15}}{(\sqrt{5})^2 - (\sqrt{3})^2}$ $\frac{1}{2}$

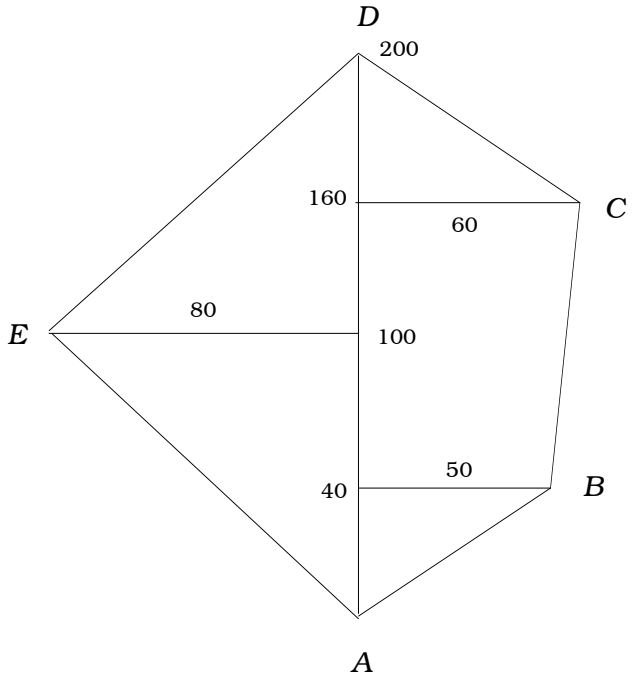
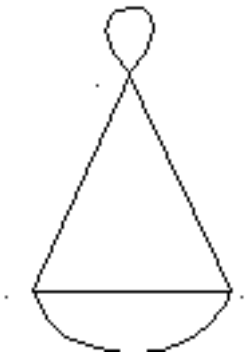
$= \frac{8 + 2\sqrt{15}}{5 - 3}$ $\frac{1}{2}$

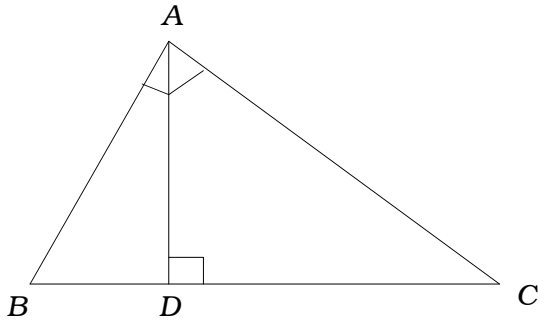
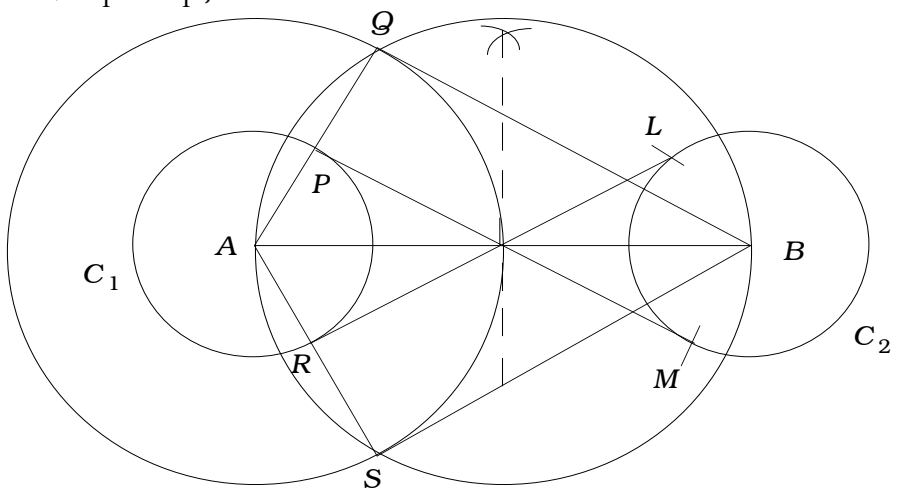
$= \frac{2(4 + \sqrt{15})}{2} = 4 + \sqrt{15}$. $\frac{1}{2}$ 2

Qn. Nos.	Value Points	Marks Allotted	
66.	Let the height be $= x$		
	$\therefore$ base $= x + 5$		
	$\frac{1}{2}\ x\ (x + 5) = 150$	$\frac{1}{2}$	
	$x^2 + 5x - 300 = 0$	$\frac{1}{2}$	
	$(x + 20)(x - 15) = 0$		
	$\therefore\ x = -20$ or $x = 15$	$\frac{1}{2}$	
	$\therefore$ height = 15 cm, base = 20 cm.	$\frac{1}{2}$	2
67.	$A = x^2 - 7x + 12$ $\quad H = x - 3$		
	$B = ?$ $\quad L = x^3 - 5x^2 - 2x + 24$		
	$B = \frac{H \times L}{A}$	$\frac{1}{2}$	
	$= \frac{(x - 3)(x^3 - 5x^2 - 2x + 24)}{x^2 - 7x + 12}$	$\frac{1}{2}$	
	$= \frac{(x - 3)(x^3 - 5x^2 - 2x + 24)}{(x - 3)(x - 4)}$	1	
	(By factorising the denominator)		
	$= \frac{x^3 - 5x^2 - 2x + 24}{x - 4}$	$\frac{1}{2}$	
	$x - 4\ )\ x^3 - 5x^2 - 2x + 24\ (\ x^2 - x - 6$		
	$x^3 - 4x^2$ $\frac{1}{2}$		
	$-x^2 - 2x$		
	$-x^2 + 4x$ $\frac{1}{2}$		
	$-6x + 24$		
	$-6x + 24$		
	0 $\frac{1}{2}$	$1\frac{1}{2}$	4
	Exp. $B = x^2 - x - 6$.		
	OR		

Qn. Nos.	Value Points	Marks Allotted	
	$B = \frac{H \times L}{A}$	$\frac{1}{2}$	
	$B = \frac{(x-3)(x^3-5x^2-2x+24)}{x^2-7x+12}$	$\frac{1}{2}$	
	Dividing		
	$x^2 - 7x + 12 \,)\, x^3 - 5x^2 - 2x + 24 \,(\, x + 2$	1	
	$x^3 - 7x^2 + 12x$		
	$2x^2 - 14x + 24$		
	$2x^2 - 14x + 24$	1	
	0		
	$\therefore$ Exp. $B = (x-3)(x+2)$	$\frac{1}{2}$	
	$= x^2 - x - 6.$	$\frac{1}{2}$	4
68.			
	To draw circle with radius 3·5 cm	$\frac{1}{2}$	
	To draw radii with angle = 110°	$\frac{1}{2}$	
	To draw tangent BP	$\frac{1}{2}$	
	To draw tangent AP.	$\frac{1}{2}$	2

Qn. Nos.	Value Points	Marks Allotted	
69.	 figure	$\frac{1}{2}$	
	In the figure, $AB \mid\mid DC$ ($ABCD$ is trapezium)		
	$\therefore \quad \Delta\ ABO \sim \Delta\ CDO$	$\frac{1}{2}$	
	$\frac{AB}{CD} = \frac{BO}{DO} = \frac{AO}{CO}$.	$\frac{1}{2}$	
	$\frac{AB}{CD} = \frac{2}{1}$ ($\because$ $BO : OD = 2 : 1$ given)	$\frac{1}{2}$	2
70.			
	$\angle PTQ + \angle POQ = 180$		
	$\therefore \quad \angle PTQ = 180 - \angle POQ$ ..... (i)	$\frac{1}{2}$	
	Now, in $\Delta\ OPQ$, $OP = OQ$	$\frac{1}{2}$	
	$\therefore \quad \angle POQ = 180° - 2 \angle OPQ$ ..... (ii)	$\frac{1}{2}$	
	Substituting in (i)		
	$\angle PTQ = 180 - (180 - 2 \angle OPQ)$	$\frac{1}{2}$	2
	$= 2 \angle OPQ.$		

Qn. Nos.	Value Points	Marks Allotted	
71.	Using scale : 20 m = 1 cm.		
			
	For calculation	1	
	Sketch	1	2
72.			
	Each correct row = $3 \times \frac{1}{2}$	$1\frac{1}{2}$	
	$\begin{array}{c\|ccc} & A & B & C \\ \hline A & 2 & 1 & 1 \\ B & 1 & 0 & 2 \\ C & 1 & 2 & 0 \end{array} = \begin{bmatrix} 2 & 1 & 1 \\ 1 & 0 & 2 \\ 1 & 2 & 0 \end{bmatrix}$		
	Sum of the elements in the matrix = sum of the order of the nodes.	$\frac{1}{2}$	2

Qn. Nos.	Value Points	Marks Allotted	
73.	General Enunciation of Pythagoras theorem.	1	
	 Figure, Data, To prove construction		
	Steps of the theorem		
	1st step $BC \cdot DB = AB^2$	1	
	2nd step $BC \cdot DC = AC^2$	1	
	3rd step $BC^2 = AB^2 + AC^2$.	1	4
74.			
	$C_3 = (C_1 + C_1)$ 		
	To draw C_1 , C_2 and C_3 circles	$1\frac{1}{2}$	
	To draw circle with diameter AB	$\frac{1}{2}$	
	To draw RL tangent, PM tangent	1	
	To measure RL and PM = 6·6 cm.	1	4

Qn. Nos.	Value Points		Marks Allotted	
75.	$8\ T_{13} = T_{10}$		$\frac{1}{2}$	
	$8 \times a\,.\,r^{12} = a\,.\,r^{9}$		$\frac{1}{2}$	
	$r^{3} = \frac{1}{8}$		$\frac{1}{2}$	
	$r = \frac{1}{2}$.		$\frac{1}{2}$	
	Now,			
	$S_{\infty} = \frac{a}{1-r}$		$\frac{1}{2}$	
	$= \frac{3}{1-\frac{1}{2}}$		$\frac{1}{2}$	
	$= \frac{3}{\frac{1}{2}}$		$\frac{1}{2}$	
	$= 3 \times \frac{2}{1} = 6.$		$\frac{1}{2}$	4
76.				

x	0	1	– 1	2	– 2
y	0	2	2	8	8

Graph	1	
Marking	1	2