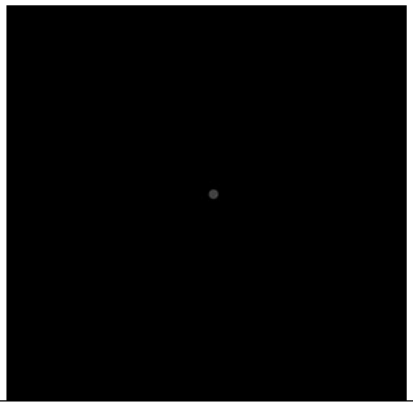
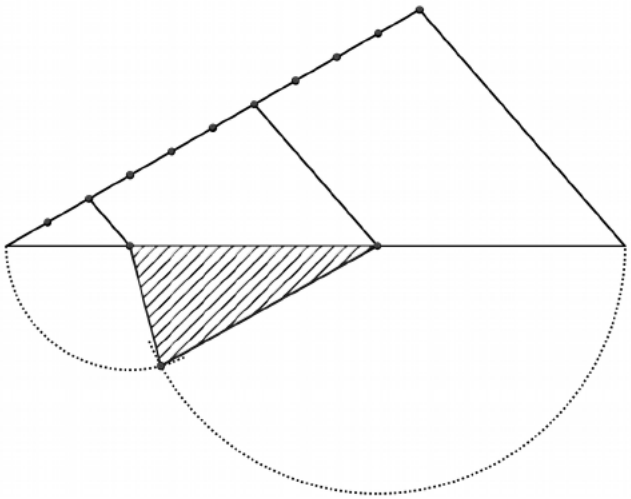
ANNUAL EXAMINATION, MARCH 2022 - 2023

STD 9 - MATHEMATICS – ANSWER KEY

E903

Qn no.	Key	Score	
	Answer any 3 questions from 1 to 4		
1	Mean $= \frac{40 + 10 + 38 + 25 + 18 + 45 + 17 + 33 + 32}{10}$	1	2
	$= \frac{280}{10} = 28$	1	
2	Volume $= 50 \times 20 = 1000\ cubic.cm$	2	2
3	$\frac{3}{10}$, $\frac{33}{100}$	2	2
4	a) $AC = \sqrt{1^2 + 2^2} = \sqrt{5}\ cm$	1	2
	b) Perimeter $= 1 + 2 + \sqrt{5} = 3 + \sqrt{5}\ cm$	1	
	Answer any 4 questions from 5 to 10		
5		2 1	3
6	a) $PS = QR = \frac{18}{2} = 9\ cm$	1	3
	$PQ = SR = \frac{14}{2} = 7\ cm$	1	
	b) Parallelogram	1	
7	a) $a(x) = x(x+2) = x^2 + 2x$	2	3
	b) $a(5) = 5^2 + 2 \times 5 = 35$	1	

8	a) 3 , -3 b) $x = 5$, $x = -5$	1 2	3
9	a) 200 : 300 = 2 : 3 b) Ratio of the number of students and the quantity of rice in the first school = 200 : 30 = 20 : 3 Ratio of the number of students and the quantity of rice in the second school = 300 : 45 = 20 : 3 Since these ratios are equal , the number of students and quantity of rice are in proportion .	1 1 1	3
10	a) 28 , 29 , 30 , 31 , 32 or any other b) 5 , 15 , 25 , 35 , 45 , 55 or any other	1 2	3
	Answer any 8 questions from 11 to 21		
11	Cost of a table is taken as x and the cost of a chair is y , $x + 4y = 7400$ $2x + 6y = 13600$ $x = 5000$, $y = 600$	1 1 2	4
12	a) Area of the triangle LQM = 48 $sq.cm$ b) $\frac{1}{2} \times 16 \times h = 48$ $h = \frac{48 \times 2}{16} = 6\ cm$ Distance between the chords AB and CD = 6 + 6 = 12 cm	1 1 1 1	4
13		4	4

14		4	4
15	a) Perimeter $= 2 \times \pi \times 20 = 40\pi\ cm$ Distance covered by the wheel in 10 rotations $= 10 \times 40\pi$ $= 400\pi\ cm$ b) Distance covered by the wheel in 10 rotations $= 10 \times 80\pi$ $= 800\pi\ cm$	1 1 2	4
16	a) Area of the circular disc $= \pi \times 10^2 = 100\pi\ sq.cm$ b) Area of each sector $= \frac{1}{4} \times 100\pi = 25\pi\ sq.cm$	2 2	4
17	a) $x = 2 + 2 = 4$, $x = 2 - 2 = 0$ b) $x = \frac{2+6}{2} = \frac{8}{2} = 4$	2 2	4
18	a) Surface area $= 6 \times$ area of a square $= 6 \times 10^2 = 600\ sq.cm$ b) Volume $=$ Base area $\times$ height $= 10^2 \times 10 = 1000\ cubic.cm$ $= 1\ litre$	2 2	4
19	a) Area of one lateral face $= \frac{90}{3} = 30\ sq.cm$ b) Lateral surface area $= 4 \times 30 = 120\ sq.cm$ { If the lateral faces are joined we get the above answer and if the	1 1 2	4

	the base faces are joined , Lateral surface area $= 6 \times 30$ $= 180\ sq.cm$ } c) Lateral surface area $= 6 \times 30 = 180\ sq.cm$		
20	a) Volume = Base area × height $= \pi \times 4^2 \times 10$ $= 160\pi\ cubic.cm$ b) New volume $= \pi \times 2^2 \times 20 = 80\pi\ cubic.cm$ Second volume is half the volume of the first volume .	2 1 1	4
21	a) Diagonal $= 10\sqrt{2}\ cm$ b) Diagonal $= x\sqrt{2}\ cm$ c) Diagonal of a square is proportional to its side . Constant of proportionality $= \frac{Diagonal}{side} = \frac{x\sqrt{2}}{x} = \sqrt{2}$	1 1 1 1	4
	Answer any 6 questions from 22 to 29		
22		3 2	5

Daily wages	Number of workers	Mid value of the class	Total wages
450 − 550	7	$\frac{450+550}{2} = 500$	$7 \times 500 = 3500$
550 − 650	8	$\frac{550+650}{2} = 600$	$8 \times 600 = 4800$
650 − 750	10	$\frac{650+750}{2} = 700$	$10 \times 700 = 7000$
750 − 850	10	$\frac{750+850}{2} = 800$	$10 \times 800 = 8000$
850 − 950	9	$\frac{850+950}{2} = 900$	$9 \times 900 = 8100$
950 − 1050	6	$\frac{950+1050}{2} = 1000$	$6 \times 1000 = 6000$
ആകെ	50		37400

Mean $= \frac{37400}{50} = 748$ Rs

23	a) $AQ : AS : AC = 1 : 2 : 3$ b) $PQ : RS : BC = 1 : 2 : 3$ c) $BC = 3 \times 8 = 24\ cm$ d) The sides of the triangle ABC is three times the sides of the triangle APQ . Constant of proportionality $= 3$	1 1 1 1 1	5
24	a) Total area of the four sectors $= \pi \times 2^2 = 4\pi\ sq.cm$ { OR Total area of the four sectors $= 4 \times \frac{90}{360} \times \pi \times 2^2 = 4\pi\ sq.cm$ } b) Area of the remaining part of the rectangle = Area of the rectangle − Total area of the four sectors $= 24 - 4\pi\ sq.cm$	3 2	5
25	a) Central angle of the piece $= 360^0 \times \frac{3}{4} = 270^0$ b) Arc length of the piece $= \frac{3}{4} \times 2\pi \times 4 = 6\pi\ cm$ Radius of the small bangle $= \frac{6\pi}{2\pi} = 3\ cm$ c) Arc length of the remaining part of the bangle = Perimeter of the bangle − Arc length of the piece $= 8\pi - 6\pi = 2\pi\ cm$ Radius of the bangle $= \frac{2\pi}{2\pi} = 1\ cm$	1 1 1 1 1	5
26	a) $QR = \sqrt{3^2 + 3^2} = \sqrt{18} = 3\sqrt{2}\ cm$ b) The number representing S $= 3\sqrt{2}$ The number representing T $= -3\sqrt{2}$	1 1 1	

	c) Distance between the points S and T $= \lvert -3\sqrt{2} - 3\sqrt{2} \rvert$ $= \lvert -6\sqrt{2} \rvert = 6\sqrt{2}$ Midpoint of S and T $= \frac{-3\sqrt{2} + 3\sqrt{2}}{2} = 0$	1 1	5
27	a) Perimeter $= 2\pi \times 50 = 100\pi\ cm$ b) Radius $= \frac{300\pi}{2\pi} = 150\ cm$ c) Perimeter $= 2\pi x$ d) The perimeter and the radius are in proportion . Constant of proportionality $= \frac{2\pi r}{r} = 2\pi$	1 1 1 1 1	5
28	a) Curved surface area of a pillar = Base perimeter × height $= 2\pi \times \frac{15}{100} \times 5 = \frac{150\pi}{100}\ sq.m$ Total curved surface area of the pillars $= 10 \times \frac{150\pi}{100} = 15\pi\ sq.m$ Total cost $= 15\pi \times 80 = 15 \times 3.14 \times 80 = 3768$ Rs.	2 1 2	5
29	a) Total number of edges = 18 b) Total number of faces = 12 c) Total number of edges $= 3 \times n$ Total number of vertices $= 2 \times n$ d) 2	1 1 1 1 1	5