

## ANSWER KEY

## Key\_ JAM 404

Q.No	Answer	Score
1	$d=4$ (7-3=4)	1
2	Angle A=70° (180°-110°)	1
3	Probability = $\frac{3}{10}$	1
4	Distance= 4 units	1
5	Base radius= 3cm $\frac{x}{360} = \frac{r}{R}$ , $\frac{90}{360} = \frac{r}{12}$	1
6	$P(1) = 0$	1
7	$\tan 30^\circ = \frac{1}{\sqrt{3}}$	1
8	24	1
9	Slant height = $10\sqrt{3}$	1
10	Y co-ordinate = 1	
11	(a) $f=5$ , $d=3$ $x_{20} = f + 19d = 5 + 19 \times 3 = 2 + 20 \times 3 = 2 + 60 = 62$	1
	(b) $x_n = dn + f - d = 3n + 5 - 3 = 3n + 2$	1
12	(a) 25 square cm	1
	(b) $\frac{1}{2}$	1
13	(a) $3\sqrt{3}$ metres	1
	(b) 3metres	1
14	$x^2 + x = x(x+1)$	2
15	32,35,38,42,43,44,45 Median weight is 42 kilograms	2
16	(a) $f=2$	1
	(b) $S_{10} = 10^2 + 10 = 100 + 10 = 110$	1
17	$PAXPB = PC^2$ , $4 \times 9 = PC^2$ , $PC = 6$ cm	2
18	Coordinates of the required point $(\frac{2x_7+1x_1}{2+1}, \frac{2x_5+1x_2}{2+1}) = (\frac{15}{3}, \frac{12}{3}) = (5, 4)$	2
19	Construction	4
20	(a) Length= $x+4$	1
	(b) $x(x+4)=77$ , $x^2+4x=77$ , $x^2+4x+4=77+4$ , $(x+2)^2=81$ , $x+2=9$ , $x=7$ side of the square is 7cm	3
21	Construction	4
22	$l^2 = h^2 + r^2$ , $l^2 = 12^2 + 9^2$ , $l^2 = 144 + 81$ , $l=15$ cm, $r=9$ cm, $h=12$ cm $TSA = \pi r(r+l) = \pi \times 9 \times (9+15)$ $= \pi(9 \times 24) = 216\pi$ cm <sup>2</sup>	4
23	(a) C(10,8)	2
	(b) (6,5)	2
24	(a) Number of pairs= $4 \times 5 = 20$	1
	(b) Probability both being odd = $\frac{6}{20} = \frac{3}{10}$	1
	(c) Probability of getting sum 10 = $\frac{4}{20} = \frac{1}{5}$	2

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25	(a) $\sin 40 = \frac{h}{10}$ , $h = 10 \times \sin 40 = 10 \times 0.64 = 6.4 \text{ cm}$	2
	(b) $\text{Area} = ah = 20 \times 6.4 = 2 \times 10 \times 6.4 = 2 \times 64 = 128 \text{ cm}^2$	2
26	(a) $PAXPB = PC^2$ , $8 \times 2 = PC^2$ , $PC = 4 \text{ cm}$	2
	(b) Construction	4
27	(a) $\angle ADC = 90^\circ$ [Angle in a semicircle]	1
	(b) Perimeter Of quadrilateral ABCD = $AB + BC + CD + AD = 10 + 10\sqrt{3} + 10\sqrt{2} + 10\sqrt{2}$ $= 10 + 20\sqrt{2} + 10\sqrt{3} \text{ cm}$	5
28	(a) B(7,1) , D(2,5)	2
	(b) Length = $7 - 2 = 5$ Breadth = $5 - 1 = 4$	2
	(c) $AC = \sqrt{(7-2)^2 + (5-1)^2}$ $= \sqrt{(5)^2 + (4)^2} = \sqrt{25 + 16} = \sqrt{41} \text{ units}$	2
29	(a) $\text{volume} = \frac{4}{3}\pi r^3$ , $r = 6 \text{ cm}$ $= \frac{4}{3}\pi 6^3 = \frac{4}{3}\pi 2 \times 3 \times 6 \times 6 = 8 \times 36 \times \pi = 288\pi \text{ cm}^3$	3
	let h be the height of cone (b) Volume of the cone = Volume of the sphere $\frac{1}{3}\pi r^2 h = 288\pi$ $\frac{1}{3} \times \pi \times 6 \times 6 \times h = 8 \times 6 \times 6 \times \pi$ , $h = 3 \times 8$ Height of the cone is 24cm	3
30	(a) Second number = $x + 5$	1
	(b) $x(x+5) = 104$ $x^2 + 5x = 104$	2
	(c) $x^2 + 5x = 104$ , $x^2 + 5x - 104 = 0$ $a=1, b=5, c=-104$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ , $x = \frac{-5 \pm \sqrt{25 - 4 \times 1 \times (-104)}}{2 \times 1}$ , $x = \frac{-5 \pm \sqrt{25 + 416}}{2 \times 1}$ $x = \frac{-5 \pm \sqrt{441}}{2}$ , $x = \frac{-5 \pm 21}{2}$ , $x = \frac{16}{2}$ The number is 8	3
31	(a) $P(x) = x^2 - 3x + 5$ $P(1) = 1^2 - 3 \times 1 + 5$ $= 1 - 3 + 5 = 1 + 5 - 3 = 3$	1
	(b) The first degree factor of $p(x) - p(1)$ is $x - 1$	1
	(c) $P(x) - P(1) = x^2 - 3x + 5 - 3 = x^2 - 3x + 2$ $x^2 - 3x + 2 = (x-1)(x-2)$ $P(x) - P(1) = 0$ , $(x-1)(x-2) = 0$ $x = 1 \text{ or } 2$ The solutions are 1, 2	4

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32	Consumption (In units)	Number of house holds	Less than cumulative frequency	
	100-120	4	4	
	120-140	8	12	
	140-160	7	19	
	160-180	10	29	
	180-200	6	35	
	200-220	4	39	
	220-240	6	45	
(a) Median is $\left(\frac{45+1}{2}\right)^{th} \text{ value} = 23^{rd} \text{ value}$				1
(b) Consumption of 20 <sup>th</sup> household = 161 units				2
(c) Median consumption = 161+6 = 167 units				3
33	(a) $f=6, d=4 \quad d/2=2$ $S_n = \frac{d}{2}n^2 + \left(f - \frac{d}{2}\right)n$ $= 2n^2 + 4n$ $S_{15} = 2(15)^2 + 4 \times 15$ $= 2 \times 225 + 60$ $= 450 + 60 = 510$			4
	(b) $x_{16} - x_1 = (16-1)d = 15 \times 4 = 60$			2
	(c) Difference = $n^2 d$ $= 15^2 \times 4 = 225 \times 4 = 900$			4
34	(a) Angle OAC = $90^\circ$ Angle ACB = $180^\circ - 110^\circ = 70^\circ$			2
	(b) Construction			6
35	(a) Drawing			3
	(b) Slope = $\frac{y \text{ difference}}{x \text{ difference}}$ $= \frac{3-1}{4-2} = \frac{2}{2} = 1$			2
	(c) Coordinates of other end of diameter (5, 2)			3