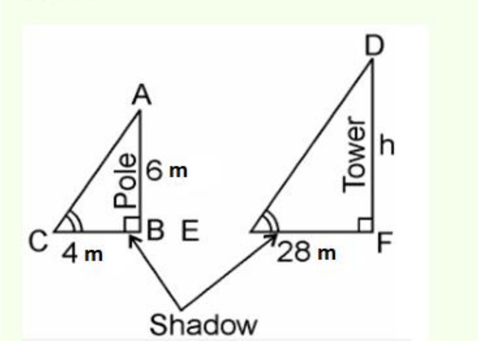
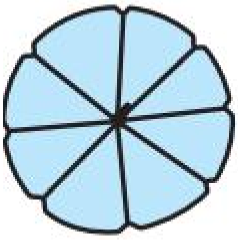
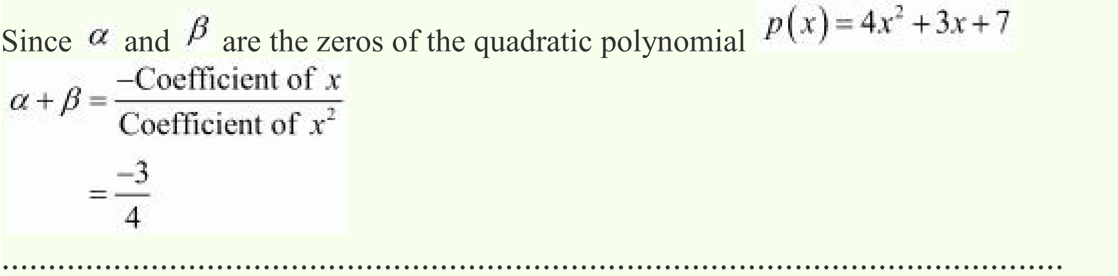
MARKING SCHEME, BSEH Practice Paper 2,10TH
MATHS(Standard) ,March-2024(ENGLISH MEDIUM)

Q. no.	Expected solutions	marks
	Section-A	
1	(b) ab^2	1
2	(c)20	1
3	(b)2	
4	(b)32 cm	1
5	(d)0,8	1
6	(a) (-6,7)	1
7	Equilateral	1
8	(a) 30^0	1
9	two	1
10	false	1
11	9	1
12	$sec\theta = \frac{\sqrt{1+\cot^2\theta}}{\cot\theta}$	1
13	(b)60^0	1
14	(b) 32 cm	1
15	78.57 cm^2	1
16	(a)a cone and a cylinder	1
17	(b)24	1
18	(c) $\frac{1}{3}$	1
19	(b) Both Assertion(A) and Reason (R) are true but Reason (R) is the not correct explanation of Assertion(A).	1
20	(d) Assertion(A) is false but Reason(R) is true.	1
	SECTION-B	
21	Here $a_1=2, b_1=3, c_1=-5$ $a_2=k, b_2=-6, c_2=-8$ …………………………………………………………………………………… For unique solution; $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$	1/2 1/2

	…………………………………………………… here, $\frac{a_1}{a_2}=\frac{2}{k},\frac{b_1}{b_2}=\frac{3}{-6}=\frac{1}{-2}$ $\Rightarrow \frac{2}{k}\neq\frac{-1}{2}$ …………………………………………………… $\Rightarrow k\neq -4$	1/2 1/2
OR 21	Given equations can be written as: $\frac{x}{2}+\frac{2y}{3}=-1$ $\Rightarrow 3x+4y=-6$……….(i) $x-\frac{y}{3}=3$ $\Rightarrow 3x-y=9$………..(ii) …………………………………………………… Equation(i) – Equation(ii) ⇒ $(3x+4y)-(3x-y)=-6-9$ …………………………………………………… ⇒ 5y=-15 ⇒ $y=-3$ …………………………………………………… Substituting the value of y in equation(i) we get 3x+4(-3)=-6 ⇒ 3x=-6+12 $\Rightarrow x=\frac{6}{3}=2$	1/2 1/2 1/2 1/2
22.	We know that the diagonals of a parallelogram bisect each other. So, coordinates of the mid-point of diagonal AC are same as the coordinates of the mid-point of diagonal BD. …………………………………………………… Since, the midpoint of the line segment joining the two points $(x_1,y_1)$and (x_2,y_2) is $\left(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2}\right)$ $\therefore \left(\frac{6+9}{2},\frac{1+4}{2}\right)=\left(\frac{8+p}{2},\frac{2+3}{2}\right)$ …………………………………………………… $\Rightarrow\left(\frac{15}{2},\frac{5}{2}\right)=\left(\frac{8+p}{2},\frac{5}{2}\right)\Rightarrow\frac{15}{2}=\frac{8+p}{2}$	1/2 1/2 1/2

	…………………………………………………………………………… $\Rightarrow\ 15\ =\ 8+p \Rightarrow P\ =\ 7$	1/2
23.		1/2
	…………………………………………………………………………… In ΔABC and ΔDEF, ∠C=∠E(angular elevation) ∠B=∠F=90° ∴ΔABC~ΔDFE (By AAA similarity criterion)	1/2
	…………………………………………………………………………… ∴ $\frac{AB}{DF}=\frac{BC}{FE}$ (If two triangles are similar then their corresponding sides are proportional.) ∴$\frac{6}{h}=\frac{4}{28}$	1/2
	…………………………………………………………………………… ⇒h=6×$\frac{28}{4}$ ⇒h=6×7 ⇒h=42m Hence, the height of the tower is 42 m.	1/2
24.	tan(A+B)=$\sqrt{3}$=tan 60° ⇒A+B= 60°--------(i)	1/2
	…………………………………………………………………………… tan(A-B)= $\frac{1}{\sqrt{3}}$=tan 30° ⇒A-B= 30°--------(ii)	1/2

	…………………………………………………………………………………… Solving (i) and (ii), we get A=45^0 …………………………………………………………………………………… and B=15^0	1/2 1/2
OR 24	$\frac{\cos45^\circ}{\sec30^\circ+\mathrm{cosec}30^\circ} = \frac{\frac{1}{\sqrt{2}}}{\frac{2}{\sqrt{3}}+2} =$ …………………………………………………………………………………… $\frac{1}{\sqrt{2}}\times\frac{\sqrt{3}}{2+2\sqrt{3}}=$ …………………………………………………………………………………… $\frac{\sqrt{3}}{2\sqrt{2}(\sqrt{3}+1)}\times\frac{\sqrt{2}\ (\sqrt{3}-1)}{\sqrt{2}(\sqrt{3}-1)} =$ …………………………………………………………………………………… $\frac{(3-\sqrt{3})\ \ \sqrt{2}}{2\times2\times(3-1)} = \frac{3\sqrt{2}-\sqrt{6}}{8}$	1/2 1/2 1/2 1/2
25.	 Radius = 45cm 8 ribs implies angle subtend between consecutive ribs = $\frac{360^\circ}{8}=45^\circ$ …………………………………………………………………………………… Area between consecutive ribs = $\frac{45}{360}\times\pi\times(45)^2$ ……………………………………………………………………………………	1/2 1/2

	$= \frac{45}{360} \times \frac{22}{7} \times 45 \times 45 = \frac{22275}{28}$ …………………………………………………………………………………………… $= 795.22$ cm^2	1/2 1/2
	SECTION-C	
26.	Consider that √2 + √3 is rational. Assume √2 + √3 = a , where a is rational. …………………………………………………………………………………… So, √2 = a - √ 3 By squaring on both sides, $2 = a^2 + 3 - 2a\sqrt{3}$ …………………………………………………………………………………… $\sqrt{3} = (a^2 + 1)/2a$, is a contradiction as the RHS is a rational number while √3 is irrational Therefore, √2 + √3 is irrational.	1 1 1
27.	Since α and β are the zeros of the quadratic polynomial $p(x) = 4x^2 + 3x + 7$ $\alpha + \beta = \frac{-\text{Coefficient of } x}{\text{Coefficient of } x^2}$ $= \frac{-3}{4}$ …………………………………………………………………………………………………	1/2

$$\alpha\beta = \frac{\text{Constant term}}{\text{Coefficient of } x^2}$$

$$= \frac{7}{4}$$ 1/2

……………………………………………………………………………………………………

We have

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

$$= \frac{\beta + \alpha}{\alpha\beta}$$ 1/2

……………………………………………………………………………………………………

$$= \frac{\frac{-3}{4}}{\frac{7}{4}}$$ 1/2

……………………………………………………………………………………………………

$$= \frac{-3}{4} \times \frac{4}{7}$$ 1/2

……………………………………………………………………………………………………

$$= \frac{-3}{7}$$ 1/2

The value of $\frac{1}{\alpha} + \frac{1}{\beta}$ is $\frac{-3}{7}$.

28. For equation x-y=1,solution table is

x	1	2
y	0	1

1

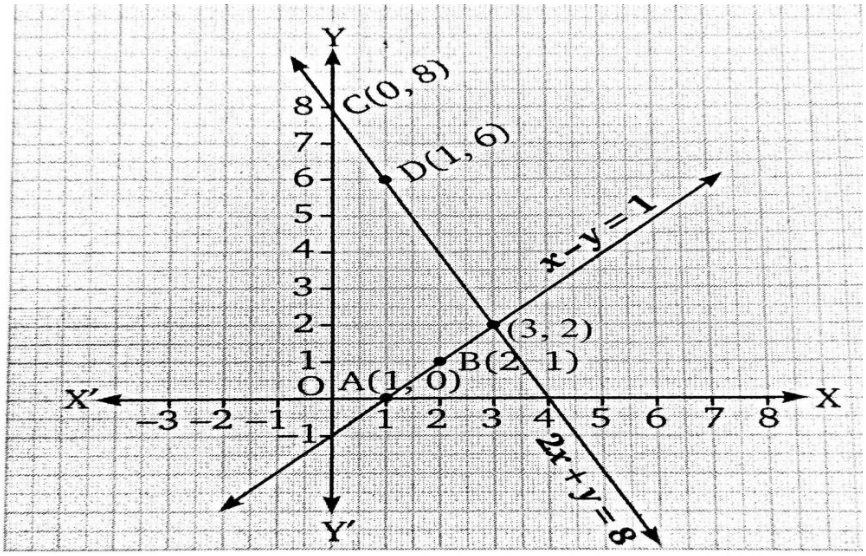
On the graph paper,plot the points A(1,0) and B(2,1) to obtain the graph of x-y=1

……………………………………………………………………………………………………

For equation 2x+y =8,solution table is

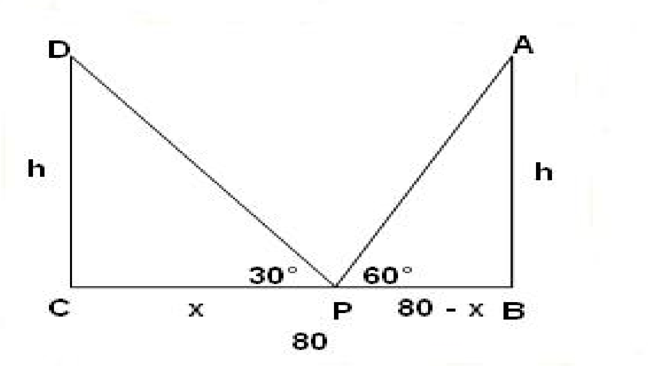
x	0	1
y	8	6

1

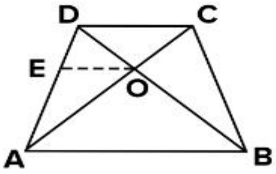
	On the graph paper,plot the points C(0,8) and D(1,6) to obtain the graph of 2x+y=8 .... Clearly,the graph of two lines intersect at a point(3,2) ∴ x=3,y=2 is the unique solution of the given system of linear equations. 	1
OR 28	Let cost of each bat = Rs x Cost of each ball = Rs y Given that coach of a cricket team buys 7 bats and 6 balls for Rs 3800. So that 7x + 6y = 3800 .... 6y = 3800 – 7x Divide by 6 we get y = (3800 – 7x) /6 … (1) .... Given that she buys 3 bats and 5 balls for Rs 1750.so that 3x + 5y = 1750	1/2 1/2 1/2

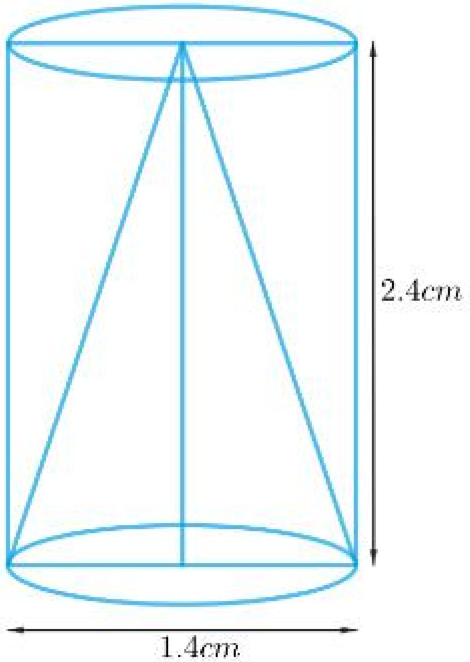
	Plug the value of y 3x + 5 ((3800 – 7x) /6) = 1750 Multiplying by 6 we get 18 x + 19000 – 35 x = 10500 -17x =10500 - 19000 …… -17x = -8500 x = - 8500 / - 17 x = 500 …… Plug this value in equation first we get y = (3800 – 7 × 500) / 6 y = 300/6 y = 50 Hence the cost of each bat = Rs.500 and the cost of each ball is Rs.50	1/2 1/2 1/2
29.	If P(x,y) is equidistant from the points A(3,6) and B(-3,4), Then AP=BP …… $\Rightarrow \sqrt{(x-3)^2+(y-6)^2} = \sqrt{(x+3)^2+(y-4)^2}$ …… $\Rightarrow (x-3)^2+(y-6)^2 = (x+3)^2+(y-4)^2$ …… $\Rightarrow x^2 -6x +9 +y^2-12y+36 = x^2 +6x+9 +y^2 -8y +16$ ……	1/2 1/2 1/2 1/2

	$\Rightarrow -12x-4y+20=0$ …… $\Rightarrow 3x+y-5=0$ is the required relation.	1/2 1/2
30.	LHS= $(\sin^4\theta-\cos^4\theta+1)\,\mathrm{cosec}^2\,\theta$ $=[(\sin^2\theta-\cos^2\theta)(\sin^2\theta+\cos^2\theta)+1]\,\mathrm{cosec}^2\,\theta$ …… $=[(\sin^2\theta-\cos^2\theta)(1)+1]\,\mathrm{cosec}^2\,\theta$ …… $=[(\sin^2\theta-\cos^2\theta)+1]\,\mathrm{cosec}^2\,\theta$ …… $=[\sin^2\theta-\cos^2\theta+\sin^2\theta+\cos^2\theta]\ \mathrm{cosec}^2\,\theta$ …… $=2\sin^2\theta\,\mathrm{cosec}^2\,\theta$ …… =2=RHS	1/2 1/2 1/2 1/2 1/2 1/2
OR 30.	LHS= $(\sin A+\mathrm{cosec}\,A)^2+(\cos A+\sec A)^2=$ $=\sin^2 A+\mathrm{cosec}^2 A+2\,sinA\,cosecA+\cos^2 A+\sec^2 A+2cosA\,secA=$ …… $=(\sin^2 A+\cos^2 A)+(\mathrm{cosec}^2 A)+(\sec^2 A)+\ 2\,sinA\,cosecA\ +$ $2cosA\,secA$ …… $=1+1+\cot^2 A+1+\tan^2 A+2+2=$ ……	1 1/2 1

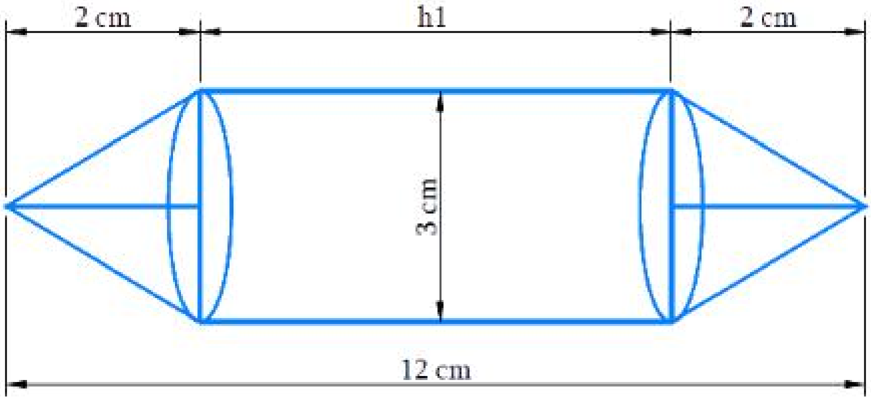
	= 7+ $\cot^2 A + \tan^2 A$ =RHS	1/2
31.	Let AB and CD be the two poles of equal height and their heights be h m. BC be the 80 m wide road. P be any point on the road. Let CP be x m, therefore BP = (80 – x) . Also, ∠APB = 60° and ∠DPC = 30° 	1/2
	…………………………………………………………………………………… In right angled triangle DCP, tan30°= $\frac{\text{CD}}{\text{CP}}$	1/2
	……………………………………………………………………………… $\frac{\text{h}}{\text{x}} = \frac{1}{\sqrt{3}}$	1/2

	$\Rightarrow\ h=\frac{x}{\sqrt{3}}$.................(1) .... In right angled triangle ABP, tan60°=AB/AP .... $\Rightarrow h/(80-x)=\sqrt{3}$ $\Rightarrow h=\sqrt{3}(80-x)$ $\Rightarrow x/\sqrt{3}=\sqrt{3}(80-x)$ $\Rightarrow x=3(80-x)$ $\Rightarrow x=240-3x$ $\Rightarrow x+3x=240$ $\Rightarrow 4x=240$ $\Rightarrow x=60$ .... Height of the pole, h=$\frac{x}{\sqrt{3}}=\frac{60}{\sqrt{3}}=20\sqrt{3}$ Thus, position of the point P is 60 m from C and height of each pole is 20√3 m.	1/2 1/2 1/2
	SECTION-D	
32.	$S_n = 4n - n^2$ $S_1= 4-1=3=a$ $S_2=8- 4=4$ .... $a_n= S_n - S_{n-1} =(4n - n^2) - \{ 4(n-1) -(n-1)^2 \}=$ $= 4n - n^2 - 4n +4 + n^2 -2n +1$ $a_n = 5-2n$ .... $\Rightarrow a_2= 5 -2(2)=1$	1 1 1

	.... ⇒ a_3= 5 -2(3)= -1	1
	.... ⇒ a_{10}= 5 -2(10)= 5-20= -15	1
33.	**Given:**In quadrilateral ABCD,O is the point of intersection AC and BD such that $\frac{AO}{BO}=\frac{CO}{DO}$	1/2
	.... **To Prove:** ABCD is a trapezium.	1/2
	.... 	1/2
	.... **Construction:** Draw OE∥AB	1/2
	.... **Proof:**In ΔDAB, OE∥AB $\frac{OB}{OD}=\frac{AE}{ED}$ ....(i) (Basic Proportionality Theorem)	1/2
	.... $\frac{AO}{BO}=\frac{CO}{DO}$ (Given) $\Rightarrow \frac{OA}{OC}=\frac{OB}{OD}$ ....(ii)	1/2
	....	

	From (i) and (ii) $\frac{\text{OA}}{\text{OC}} = \frac{\text{AE}}{\text{ED}}$	1/2
	....	
	Now,In ΔADC, $\frac{\text{OA}}{\text{OC}} = \frac{\text{AE}}{\text{ED}}$	
	⇒ OE∥ DC ....(iii) (converse of Basic Proportionality Theorem)	1/2
	....	
	Also OE∥AB ....(iv)	
	From (iii) and (iv)	
	DC∥AB	1/2
	....	
	∴ quadrilateral ABCD is a trapezium.	1/2
34.		1/2
	....	
	Height of the cylinder = Height of the cone = h = 2.4 cm	
	Diameter of the cylinder = diameter of the cone = d = 1.4 cm	1/2
	Radius of the cylinder = radius of the cone = r = d / 2 = 1.4 / 2 cm = 0.7 cm	
	....	

	Slant height of the cone, $l = \sqrt{[r^2 + h^2]}$	
	$l = \sqrt{[(0.7\text{ cm})^2 + (2.4\text{ cm})^2]}$	
	$= \sqrt{[0.49\text{ cm}^2 + 5.76\text{ cm}^2]}$	
	$= \sqrt{[6.25\text{ cm}^2]}$	
	= 2.5 cm	1
	....	
	TSA of the remaining solid = CSA of the cylindrical part + CSA of conical part + Area of one cylindrical base	1
	....	
	$= 2\pi rh + \pi rl + \pi r^2$	1
	....	
	$= \pi r (2h + l + r)$	
	= 22/7 × 0.7 cm × (2 × 2.4 cm + 2.5 cm + 0.7 cm)	1/2
	....	
	= 2.2 cm × 8 cm	
	$= 17.6\text{ cm}^2$	1/2
	Hence, the total surface area of the remaining solid to the nearest cm^2 is 18 cm^2.	
OR 34.	Length of the model = Height of the cylindrical part + 2 × Height of the conical part Volume of the cylinder = $\pi r^2 h_1$, where r and h_1 are the radius and height of the cylinder respectively. Volume of the cone = 1/3 $\pi r^2 h_2$, where r and h_2 are the radius and height of the cone respectively.	1/2

	…………………………………………………………………………………………  	1/2
	………………………………………………………………………………………… Height of each conical part, $h_2 = 2$ cm Height of cylindrical part = Length of the model - 2 × Height of the conical part $h_1 = 12$ cm - 2 × 2 cm = 8 cm	1/2
	Diameter of the model, d = 3 cm Radius of cylindrical part = radius of conical part = r = 3/2 cm = 1.5 cm ………………………………………………………………………………………… Volume of the model = 2 × Volume of the conical part + Volume of the cylindrical part	1
	………………………………………………………………………………………… $= 2 \times 1/3\ \pi r^2 h_2 + \pi r^2 h_1$	1
	………………………………………………………………………………………… $= \pi r^2\ (2/3\ h_2 + h_1)$ = 22/7 × 1.5 cm × 1.5 cm × (2/3 × 2 cm + 8 cm)	1

…………………………………………………………………………………………………

$= 22/7 \times 1.5 \text{ cm} \times 1.5 \text{ cm} \times 28/3 \text{ cm}$

1/2

$= 66 \text{ cm}^3$

Thus, the volume of air in the model is 66 cm^3.

35.

class interval	class-mark (x_{i})	Number of children(f_{i})	$f_i x_i$
11-13	12	7	84
13-15	14	6	84
15-17	16	9	144
17-19	18	13	234
19-21	20	f	20f
21-23	22	5	110
23-25	24	4	96
		$\sum f_i$ =44+f	$\sum f_i x_i$=752+20

1+1

………………………………………………………………………………………………

$$\text{Mean} = \bar{x} = \frac{\sum f_i x_i}{\sum f_i}$$

1/2

………………………………………………………………………………………

$$\Rightarrow 18 = \frac{752+20f}{44+\text{f}}$$

1/2

……………………………………………………………………………………………

$\Rightarrow$ 18(44+f) =752+20f

1/2

………………………………………………………………………………………………

$\Rightarrow$ 792 +18f = 752+ 20f

1/2

…………………………………………………………………………………………………
.

$\Rightarrow 792-752 = 20f - 18\,f$ 1/2

....

$\Rightarrow 40 = 2f$

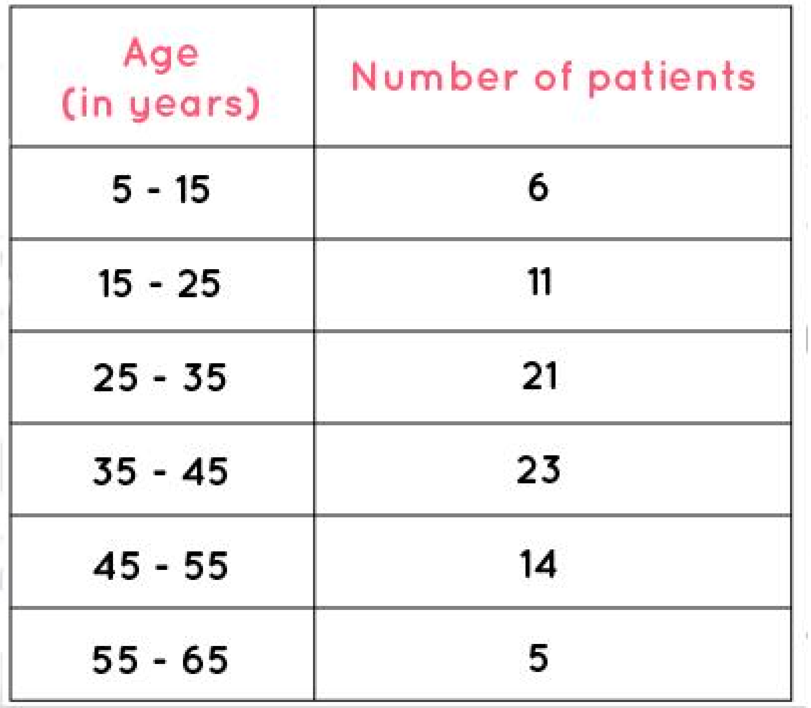
1/2

$\Rightarrow f = 20$

Hence, missing frequency f =20

OR

35



Age (in years)	Number of patients
5 - 15	6
15 - 25	11
25 - 35	21
35 - 45	23
45 - 55	14
55 - 65	5

From the table, it can be observed that the maximum class frequency is 23, belonging to class interval 35 − 45.

Therefore, Model class = 35 − 45

1/2

....

Class size, h = 10

1/2

....

Lower limit of model class, l = 35

1/2

....

	Frequency of modal class, $f_1 = 23$	1/2
	....	
	Frequency of class preceding modal class, $f_0 = 21$	1/2
	....	
	Frequency of class succeeding the modal class, $f_2 = 14$	1/2
	....	
	Mode = $l + [(f_1 - f_0)/(2f_1 - f_0 - f_2)] \times h$	1/2
	....	
	$= 35 + [(23 - 21)/(2 \times 23 - 21 - 14)] \times 10$	1/2
	....	
	$= 35 + [2/(46 - 35)] \times 10$ $= 35 + (2/11) \times 10$	1/2
	....	
	$= 35 + 1.8$ $= 36.8$	1/2
	So, the modal age is 36.8 years which means the maximum number of patients admitted to the hospital are of age 36.8 years.	
	SECTION -E	
36.	(i) Let total number of camels be x^2	

	Then no. of camels seen in forest = $x^2/4$ No. of camels gone to mountain = 2x No. of camels seen on the bank = 15 …………………………………………………………………………………………… Therefore, Total no. of camels, $x^2 = x^2/4 + 2x + 15$ ⇒ $x^2 = (x^2 + 8x + 60)/4$ ⇒ $4x^2 = x^2 + 8x + 60$ ⇒ $3x^2 - 8x - 60 = 0$ …………………………………………………………………………………………… ⇒ $(3x +10)(x - 6) = 0$ ⇒ $(3x +10) = 0$ or $(x - 6) = 0$ ⇒ $x = -10/3$ or $x = 6$ on squaring, ⇒ $x^2 = 100/3$ or $x^2 = 36$ …………………………………………………………………………………………… No. of camels can not be a fraction Hence $x^2 = 36$ No. of camels = 36	1/2 1/2 1/2 1/2
OR 36. (i)	Discriminant $D= b^2 -4ac$ Roots of quadratic equation $a x^2 + b x +c = 0$ depend on nature of Discriminant D If $D= b^2 -4ac > 0$ then roots are real and distinct. …………………………………………………………………………………… If $D= b^2 -4ac = 0$ then roots are real and equal. …………………………………………………………………………………………… If $D= b^2 -4ac < 0$ then roots are not real.	1/2 1/2 1/2

	…………………………………………………………………………………………… No. of camels seen on the bank = 15	1/2
	(ii) No. of camels gone to mountain = 2(6)=12	1
	(iii) no. of camels seen in forest = $x^2/4 = \frac{36}{4} = 9$	1
37.	(i) $\angle ROQ = 180° - 30° = 150°$ $(\because \angle ORP = \angle OQP = 90°)$	1
	(ii)$\angle OQR + \angle ORQ + 150° = 180°$ $\Rightarrow 2\angle OQR = 30° \Rightarrow \angle OQR = 15°$ …………………………………………………………………………………………… $\therefore \angle RQP = 90° - 15° = 75°$	1 1
	OR (ii)$\angle RSQ = \angle RQP = 75°$ (Angles in the alternate segments) …………………………………………………………………………………………… $\angle ORP$=90° $(\because OR \perp RP)$	1 1
	(iii) Kite	1
38.	(i)Possible outcomes are 4 which are HH,HT,TH,TT	1
	(ii)Probability of failure= 1- Probability of successs= $1 - \frac{73}{100} = \frac{27}{100}$ =27%	1
	(iii) Cases favourable to atleast one head are HT,TH,HH P(Akriti will start the game)=P(getting atleast one head)= = P(HH,HT,TH)= $\mathbf{\frac{3}{4}}$	1 1

	OR (iii) Cases favourable to atmost one tail are TT,HT,TH P(Sukriti will start the game)=P(getting atmost one tail)= = P(TT,HT,TH)= $\frac{3}{4}$	1 1