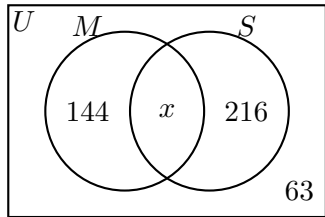


**SEE-2082 (2026)**  
**Compulsory Mathematics**  
**Marking Scheme**  
**RE-1031-KoP**

Q.N	Items / Descriptions	Marks
1.	a. $n(U) = 450$	1
	b. Venn diagram	1
		
	$n_o(M) = 144$ $n(U) = 450$ $n_o(S) = 216$ $n(\overline{M \cup S}) = 63$	
	c. Let $n(M \cap S) = x$	
	i. $144 + x + 216 + 63 = 450$	1
	ii. $n(M \cap S) = 450 - 423 = 27$	1
	iii. $n(M) = 144 + 27 = 171$	1
	d. Percentage: $\frac{(63-27)}{63} \times 100\% = 57.14\%$ less	1
2.	a. Correct definition	1
	b. i. C.A. of first year = Rs. 6,05,000	1 + 1
	ii. C.A. after 2 years = Rs. 6,67,012.50	
	c. i. CI of 1 <sup>st</sup> year and CI of 2 <sup>nd</sup> years are Rs 55,000 and Rs 62,012.50	1 + 1
	ii. Comparison: Rs. 7,012.50 more in 2nd year. Or any comparison	
3.	a. $P_T = P_0(1 + \frac{R}{100})^T$	1
	b. i. $1,26,075 = P_0(1 + \frac{2.5}{100})^2$	1 + 1
	ii. $P_0 = \frac{1,26,075}{1.050625} = 1,20,000$	
	c. Population after 1 year: $= 1,25,000 \times (1 + \frac{2.5}{100})^1 = 1,28,125$	1
4.	a. Selling Rate	1
	b. Amount in USD: $\$ \left( \frac{796,544}{142.24} \right) = \$5,600$	1

Q.N	Items / Descriptions	Marks
	c. i. New exchange buying rate after 0.3% devaluation: $= 141.64 \left(1 + \frac{0.3}{100}\right) = \text{NRs } 142.06492$ $\$5600 = \text{NRs } 7,95,563.552$ ii. Loss = NRs 980.448	1 + 1
5.	a. Total surfaces = 5 b. i. Slant height: $l = \sqrt{e^2 - (a/2)^2}$ $l = \sqrt{(676 - 100)} = 24 \text{ cm}$ ii. $TSA = (20)^2 + 2 \times 20 \times 24$ iii. $TSA = 1360 \text{ cm}^2$ c. Vertical height: $h = \sqrt{24^2 - 10^2} = 21.82 \text{ cm}$ h is 2.18 cm less than slant height ( $l$ ) (or any other comparison)	1 1 +1 +1 1
6.	a. Formula for volume: $V = \frac{1}{3}Ah = \frac{1}{3}a^2h = \frac{1}{3} \times \text{base area} \times \text{height}$ b. Height of conical part: $= 20 \text{ cm} - 7 \text{ cm} = 13 \text{ cm}$ c. (i) Volume $= \frac{1}{3} \times \frac{22}{7} \times 7 \times 7 \times 13 + \frac{2}{3} \times \frac{22}{7} \times 7 \times 7 \times 7$ (ii) Volume = 1386 cm <sup>3</sup>	1 1 1 + 1
7.	a. i. Volume of wall (with 10% less): $= 2,70,00,000 \text{ cm}^3$ ii. Number of bricks = 18,000 b. i. Total cost of bricks: $= 18,000 \times 13.50 + 9 \times 600$ $= 2,43,000 + 5,400$ ii. Rs. 2,48,400	1 + 1 1 + 1
8.	a. Arithmetic sequence. b. i. Sum of 12 terms: $S_{12} = \frac{12}{2}[2 \times 2000 + 11 \times 2000]$ ii. $S_{12} = \text{Rs. } 1,56,000$ c. i. $4,20,000 = \frac{n}{2}[2 \times 2000 + (n - 1)2000]$ $8,40,000 = n[2000 + 2000n]$ $420 = n^2 + n$ $n^2 + n - 420 = 0$ $n = 20$ (rejecting negative value) ii. In 20th month she needs it.	1 1 + 1 1 + 1
9.	a. $10x + y$ (where x tens digit, $y =$ units digit) b. i. $xy = 20$ and $x - y = 1$ ii. $x^2 - x - 20 = 0$ $x = 5$ or $-4$ (rejected) iii. Required number $= 10 \times 5 + 4 = 54$	1 1 +1 +1
10.	a. For $\sqrt{x} = 2 \Rightarrow x = 4$	1

Q.N	Items / Descriptions	Marks
	b. i. Let $2^a = x$ , $x + \frac{1}{x} = 5/2$ $2x^2 - 5x + 2 = 0$ $(2x - 1)(x - 2) = 0$ ii. $x = 2$ or $1/2$ iii. $a = 1$ or $-1$	1 +1 +1
	c. i. $\frac{p^2+pq+q^2-p^2-q^2}{p^4+p^2q^2+q^4}$ ii. $\frac{pq}{p^4+p^2q^2+q^4}$	1 + 1
11.	a. Equal in area	1
	b. i. Area of $\triangle SMN = \frac{1}{2} \times MN \times \text{height}$ Area of parallelogram MNPR = $MN \times \text{height}$ ii. Ar. of $\triangle SMN = \frac{1}{2}$ Ar. of parallelogram MNPR	1 + 1
	c. i. Ar. of $\square SMNQ$ - Ar. of $\triangle MAN$ = Area of parallelogram MNPR - Ar. of $\triangle MAN$ ii. Ar. of $\square SMAQ$ = Ar. of $\square PRAN$	1 + 1
12.	a. Double or Half. Central angle is double of inscribed angle. Inscribed angle is half of central angle.	1
	b. $(x + 60)^\circ = 2 \times (2x)^\circ$ $x + 60 = 4x$ $x = 20$	1
	c. i. Correct figure with naming ii. Correct measurement with conclusion	1 + 1
13.	a. i. Construction of $\triangle MNS$ ii. Correct length of 6.8 cm iii. Correct construction of parallelogram	1 +1 +1
	b. Correct reason	1
14.	a. Correct figure	1
	b. Height of pole above the water level: = $51.5 - 1.5 = 50$ m	1
	c. $\tan \theta = \frac{50\text{m}}{50\text{m}} \Rightarrow \theta = 45^\circ$	1
	d. $\tan 30^\circ = \frac{50}{\text{radius}}$ Radius = $50\sqrt{3} = 86.60$ m	1

Q.N	Items / Descriptions	Marks																																			
15.	a. <u>Table values:</u>	1 + 1																																			
	<table border="1"> <thead> <tr> <th>x</th> <th>f</th> <th>m</th> <th>fm</th> <th>c.f.</th> </tr> </thead> <tbody> <tr> <td>0-20</td> <td>2</td> <td>10</td> <td>20</td> <td>2</td> </tr> <tr> <td>20-40</td> <td>3</td> <td>30</td> <td>90</td> <td>5</td> </tr> <tr> <td>40-60</td> <td><math>x = 6</math></td> <td>50</td> <td><math>50x</math></td> <td>11</td> </tr> <tr> <td>60-80</td> <td>5</td> <td>70</td> <td>350</td> <td>16</td> </tr> <tr> <td>80-100</td> <td>4</td> <td>90</td> <td>360</td> <td>20</td> </tr> <tr> <td><b>Total</b></td> <td><math>14 + x</math></td> <td></td> <td><math>820 + 50x</math></td> <td></td> </tr> </tbody> </table>	x	f	m	fm	c.f.	0-20	2	10	20	2	20-40	3	30	90	5	40-60	$x = 6$	50	$50x$	11	60-80	5	70	350	16	80-100	4	90	360	20	<b>Total</b>	$14 + x$		$820 + 50x$		
x	f	m	fm	c.f.																																	
0-20	2	10	20	2																																	
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40-60	$x = 6$	50	$50x$	11																																	
60-80	5	70	350	16																																	
80-100	4	90	360	20																																	
<b>Total</b>	$14 + x$		$820 + 50x$																																		
	i. $56 = \frac{820+50x}{14+x}$																																				
	ii. $x = 6$																																				
	b. Modal class = 40-60	1																																			
	c. i. $Q_1$ lies on 20-40 class	1 + 1																																			
	ii. $Q_1 = 20 + \left[\frac{5-2}{3}\right] \cdot 20 = 40$																																				
	d. Ratio $15 : 5 \Rightarrow 3 : 1$ or 10 more or less Or any suitable reason	1																																			
16.	a. $P(A \cup B) = P(A) + P(B)$	1																																			
	b. i. Tree Diagram for first drawn	1 + 1																																			
	ii. Tree Diagram for second drawn																																				
	c. P(same colour): $P(WW) + P(BB) = \left(\frac{6}{10} \times \frac{6}{10}\right) + \left(\frac{4}{10} \times \frac{4}{10}\right) = \left(\frac{36}{100} + \frac{16}{100}\right) = \frac{52}{100} = \frac{13}{25}$	1																																			
	d. P(different colour): $1 - \frac{13}{25} = \frac{12}{25}$ <i>Ratio = 13 : 12</i>	1																																			

**Alternative method for Question Number 10.:**

$$\begin{aligned}
 2^x + \frac{1}{2^x} &= \frac{5}{2} \\
 k + \frac{1}{k} &= \frac{5}{2} \\
 \frac{k^2 + 1}{k} &= \frac{5}{2} \\
 2k^2 - 5k + 2 &= 0 \\
 2k^2 - 4k - k + 2 &= 0 \\
 2k(k - 2) - 1(k - 2) &= 0 \\
 k &= 2, \frac{1}{2}
 \end{aligned}$$