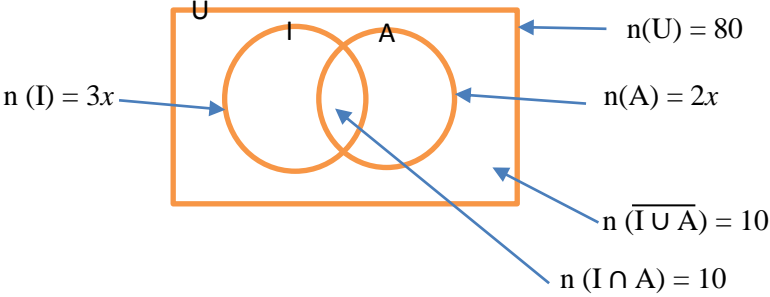


## SEE - 2082 (2026)

## अनिवार्य गणित

## उत्तरकुञ्जिका

अन्य बैकल्पिक तरिकाबाट समस्या समाधान गरेमा पनि अङ्क प्रदान गर्नुपर्ने छ । उत्तरकुञ्जिकामा प्रत्येक चरणको प्राप्ताङ्क १ भएतापनि विद्यार्थीहरूले आंशिक समाधान गरेको अवस्थामा तथा सामान्य कुराहरू (जस्तै: एकाइ) छुट हुन गएमा समेत ०.५ अङ्क प्रदान गर्नुपर्नेछ ।

प्र.नं.	उत्तर	अङ्क
1.	<p>(a) <math>n(I \cap A) = 10</math></p> <p>(b) Venn diagram with correct information.</p>  <p>(c) i. <math>3x - 10 + 10 + 2x - 10 + 10 = 80</math></p> <p>ii. <math>x = 16</math></p> <p>iii. <math>n_o(I) = 3x - 10 = 38</math></p> <p>(d) <math>n_o(I) = 38</math> and <math>n_o(A) = 2x - 10 = 22</math></p> <p><math>n_o(I) &gt; n_o(A)</math> by 16</p> <p>Required more percent = <math>\frac{16}{22} \times 100\% = 72.73\%</math></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>
2.	<p>(a) 4 times</p> <p>(b) (i) Amount for 1<sup>st</sup> year,</p> <p>C.A. = Rs. 5,00,000 <math>(1 + \frac{8}{200})^2 = \text{Rs.}5,40,800</math></p> <p>(ii) Amount for 2<sup>st</sup> year,</p> <p>C.A. = Rs.2,40,800 <math>(1 + \frac{8}{200})^2 = \text{Rs.}2,60,449.28</math></p> <p>(c) i. C.A. of 2 years = Rs.5,00,000 <math>(1 + \frac{8}{200})^{2 \times 2} = \text{Rs.}5,84,929.28</math></p> <p>ii. more interest to be paid = Rs.84,929.28 – Rs.60,449.28 = Rs.24,480</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>
3.	<p>(a) <math>P_T</math> represents price after T years</p> <p>(b) i. Rs.1,44,00,000 = <math>P_o (1 + \frac{20}{100})^2</math></p> <p>ii. <math>P_o = \text{Rs.}1,00,00,000</math></p> <p>(c) i. Price after 2 years at depreciation 10%</p> <p><math>P_T = \text{Rs.}1,44,00,000 (1 - \frac{10}{100})^2</math></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>

प्र.नं.	उत्तर	अङ्क
	ii. $P_T = \text{Rs.}1,16,64,000$	1
4.	(a) $\text{AUS } \$ 5,000 = \text{NRs.}93.20 \times 5000 = \text{NRs.}4,66,000$ (b) Buying rate of $\text{AUS } \$ 1 = \text{NRs.}93.20 \times 101.5\% = \text{NRs.}94.598$ Selling rate of $\text{AUS } \$ 1 = \text{NRs.}93.59 \times 101.5\% = \text{NRs.}94.99385$ (c) $\text{AUS } \$ 5,000 = \text{NRs.}94.598 \times 5000 = \text{NRs.}4,72,990$ Profit by $\text{NRs.}4,72,990 - \text{NRs.}4,66,000 = \text{NRs.}6,990$	1 1 1
5.	(a) They are equal in area (b) (i) $2 \times a \times 20 = 1280$ (ii) $\therefore a = 32 \text{ cm}$ (c) Total surface area $= 1280 + (32)^2 = 2304 \text{ sq.cm}$ $\therefore \text{TSA} : \text{LSA} = 2304 : 1280 = 9 : 5$	1 1 1 1
6.	(a) Volume of Cone $(V) = \frac{1}{3} \pi r^2 h$ (b) i. Volume of solid object $(v) = \pi r^2 (h_1 + \frac{1}{3} h_2)$ $= \frac{22}{7} \times 49 (30 + \frac{1}{3} \times 24)$ ii. $= 5,852 \text{ cm}^3$ (c) i. Slant height of Cone $(l) = 25 \text{ cm.}$ Total surface area $= \pi r l + 2\pi r h + \pi r^2 = \frac{22}{7} \times 7 (25 + 2 \times 30 + 7)$ ii. Total surface area $= 2024 \text{ cm}^2$	1 1 1 1 1
7.	(a) cost for Carpeting $= \text{Rs.}250 \times (16 \times 14) = \text{Rs.} 56,000$ (b) i. Area of 4 walls and ceiling excluding door and windows (A) $= 2 \times 10 (16 + 14) + 16 \times 14 - 2 (3.5)^2 - (3 \times 6)$ ii. Area $= 781.5 \text{ ft}^2$ iii. Rate of plastering $= \frac{\text{Rs.}1,18,200}{781.5} = \text{Rs.}151.25$	1 1 1 1
8.	(a) $m = \frac{a+b}{2}$ (b) i. First term $(a) = \text{Rs.}60,000 \times 12 = \text{Rs.}7,20,000$ and Com. Diff. $(d) = \text{Rs.}24,000$ $S_7 = \frac{7}{2} [2 \times 7,20,000 + 6 \times 24,000]$ ii. $S_7 = \text{Rs.}55,44,000$ (c) i. $\text{Rs.}1,02,24,000 = \frac{n}{2} [2 \times 7,20,000 + (n-1) \times 24,000]$ Or, $n^2 + 59n - 852 = 0$ ii. $n = 12 \text{ years}$	1 1 1 1 1

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9.	<p>(a) Roots of quadratic equation are <math>\frac{-b+\sqrt{b^2-4ac}}{2a}</math> &amp; <math>\frac{-b-\sqrt{b^2-4ac}}{2a}</math></p> <p>(b) i. <math>l = 2b - 3</math> and <math>l \times b = 135</math>  ii. <math>b = 9\text{m}</math> and <math>l = 15\text{m}</math></p> <p>(c) i.</p> <div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td></td> <td style="text-align: center;">4m</td> <td style="text-align: center;">4m</td> <td style="text-align: center;">4m</td> <td style="text-align: center;">3m</td> <td></td> </tr> <tr> <td style="text-align: center;">4m</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="background-color: #cccccc;"></td> <td rowspan="3" style="text-align: center; vertical-align: middle;">9m</td> </tr> <tr> <td style="text-align: center;">4m</td> <td style="text-align: center;">4</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> <td style="background-color: #cccccc;"></td> </tr> <tr> <td style="text-align: center;">1m</td> <td colspan="4" style="background-color: #cccccc;"></td> </tr> <tr> <td></td> <td colspan="5" style="text-align: center;">15m</td> <td></td> </tr> </table> </div> <p>ii. 6 pieces</p>		4m	4m	4m	3m		4m	1	2	3		9m	4m	4	5	6		1m						15m						<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>
	4m	4m	4m	3m																											
4m	1	2	3		9m																										
4m	4	5	6																												
1m																															
	15m																														
10.	<p>(a) i. <math>\frac{px+py-px+py}{(x+y)(x-y)}</math>  ii. <math>\frac{2py}{x^2-y^2}</math></p> <p>(b) i. <math>2^x + \frac{1}{2^x} = \frac{5}{2}</math>  let, <math>a + \frac{1}{a} = \frac{5}{2}</math>  ii. <math>a = 2</math> and <math>\frac{1}{2}</math>  iii. <math>\therefore x = \pm 1</math></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>																													
11.	<p>(a) Area of parallelogram = 2 × area of triangle</p> <p>(b) i. <math>\Delta PQR = 1/2</math> Parallelogram PQRS (correct reason)  ii. <math>\Delta QRT = 1/2</math> Parallelogram PQRS  <math>\therefore \Delta PQR = \Delta QRT</math></p>	<p>1</p> <p>1</p> <p>1</p>																													
12.	<p>(a) <math>180^\circ</math></p> <p>(b) <math>x + 3x = 180^\circ</math>  <math>x = 45^\circ</math></p> <p>(c) i. correct figure of two circles  ii. correct measurement with table and conclusion.</p> <p>(d) i. <math>\angle WOY = 2 \times 45^\circ = 90^\circ</math> &amp; <math>\angle WZY = 135^\circ</math>  ii. <math>\angle OWZ + \angle OYZ = 360^\circ - 90^\circ - 135^\circ = 135^\circ</math></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>																													
13.	<p>(a) i. Construction of parallelogram PQRS according to given measurement.  ii. Making <math>QT = 5\text{cm}</math> and <math>QR = RU = 6\text{cm}</math>  iii. For <math>\Delta QTU</math> with conclusion</p> <p>(b) For correct reason.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>																													

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14.	<p>(a) <math>60^\circ</math></p> <p>(b) <math>\tan 60^\circ = \frac{AE}{15}</math></p> <p><math>\therefore AE = 15\sqrt{3} m</math></p> <p>(c) <math>CD = 45 - 15\sqrt{3} m = 19.02 m</math></p> <p>(d) <math>15\sqrt{3} m - 15 = 10.98 m</math></p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>																																			
15.	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>C.I</th> <th>f</th> <th>c.f</th> <th>Mid value (m)</th> <th>f × m</th> </tr> </thead> <tbody> <tr> <td>0-10</td> <td>4</td> <td>4</td> <td>5</td> <td>20</td> </tr> <tr> <td>10-20</td> <td>m+2</td> <td>6 + m</td> <td>15</td> <td>180</td> </tr> <tr> <td>20-30</td> <td>10</td> <td>16 + m</td> <td>25</td> <td>250</td> </tr> <tr> <td>30-40</td> <td>9</td> <td>25 + m</td> <td>35</td> <td>315</td> </tr> <tr> <td>40-50</td> <td>5</td> <td>30 + m</td> <td>45</td> <td>225</td> </tr> <tr> <td></td> <td>N=30 + m</td> <td></td> <td></td> <td><math>\sum fm = 990</math></td> </tr> </tbody> </table> <p>(a) Median class = 20 – 30</p> <p>(b) i. <math>24 = 20 + \left[ \frac{30+m}{2} - (6 + m) \right] \times \frac{10}{10}</math></p> <p>ii. m = 10</p> <p>(c) i. <math>\sum fm = 990</math></p> <p>ii. mean <math>(\bar{x}) = 24.75</math></p> <p>(d) modal class = 10-20 (highest frequency 12) &amp; <math>Q_1</math> class = <math>\left(\frac{N}{4}\right)^{\text{th}}</math> term = 10<sup>th</sup> term = (10- 20)</p> <p><math>\therefore</math> Yes , same</p>	C.I	f	c.f	Mid value (m)	f × m	0-10	4	4	5	20	10-20	m+2	6 + m	15	180	20-30	10	16 + m	25	250	30-40	9	25 + m	35	315	40-50	5	30 + m	45	225		N=30 + m			$\sum fm = 990$	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>
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16.	<p>(a) <math>P(A \cap B) = P(A) \times P(B)</math></p> <p>(b) Let, Green ball and Blue ball are denoted by G and B respectively.</p> <p>i. Tree diagram for 1<sup>st</sup> drawn</p> <p>ii. Tree diagram for 2<sup>nd</sup> drawn</p> <p>(c) i. <math>P(BB) = \frac{7}{12} \times \frac{7}{12} = \frac{49}{144}</math></p> <p>(d) <math>P(\text{Same colour balls}) = P(BB \text{ or } GG) = \frac{49}{144} + \frac{25}{144} = \frac{37}{72}</math></p> <p><math>P(\text{different colours}) = 1 - \frac{37}{72} = \frac{35}{72}</math></p> <p><math>\therefore</math> Required Ratio = 37: 35</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>																																			