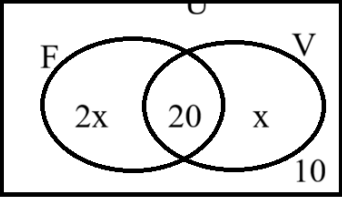


## SEE - 2082 (2026)

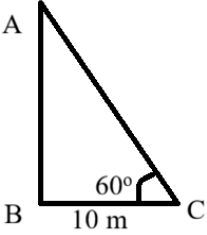
## अनिवार्य गणित

## 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. | उप - प्र.नं. | उत्तर  | अङ्क        |
|---------|--------------|--|-------------|
| 1       | a            | $n(F \cap V) = 20$   | 1           |
|         | b            | Let, $n_o(F) = 2x$ and $n_o(V) = x$<br>$n(U) = 120$ →    | 1           |
|         | c            | For correct Venn diagram<br>From Venn diagram:<br>i) $2x + 20 + x + 10 = 120$<br>$3x + 30 = 120 \Rightarrow 3x = 90$<br>ii) $x = 30$<br>iii) $n(F) = 2 \times 30 + 20 = 80$            | 1<br>1<br>1 |
|         | d            | $n(V) = 50$ , which is 37.5% less  | 1           |
| 2       | a            | i) For $P(1.21) - P(1.1) = \text{Rs.}47250$<br>ii) $P = \text{Rs.}429545.45$   | 1<br>1      |
|         | b            | i) Quarterly C.I. = $\text{Rs.}44592.35$<br>Semi-annual C.I. = $\text{Rs.}44028.41$<br>ii) Difference = $\text{Rs.}563.94$   | 1<br>1      |
| 3       | a            | For correct definition of compound depreciation  | 1           |
|         | b            | Depreciated price = 20% of $\text{Rs.}50,000$<br>= $\text{Rs.}10,000$  | 1           |
|         | c            | i) Price of machine after 3 years = $\text{Rs.}25,600$<br>ii) Half of the price is $\text{Rs.}25,000 < \text{Rs.}25,600$<br>So, it is NOT possible.<br><i>Or, any suitable reason.</i> | 1<br>1      |
| 4       | a            | Buying rate is used.   | 1           |
|         | b            | $3000 \times \text{NRs } 142.48 = \text{NRs } 4,27,440$  | 1           |
|         | c            | Buying rate: $\text{NRs } 143.1924$<br>Selling rate: $\text{NRs } 143.7954$<br>$\therefore$ Difference = 0.603 or any comparison   | 1           |
|         | d            | After devaluation:<br>i) $\$3000 = \text{NRs } 3000 \times 143.1924 = \text{NRs } 4,29,577.20$<br>ii) $\therefore$ Profit/Gain = $\text{Rs. } 2,137.20$                                | 1<br>1      |
| 5       | a            | 'a' denotes side or length of the base.  | 1           |

|    |    |   |             |
|----|----|---|-------------|
|    | b  | i) For $960 \text{ cm}^3 = \frac{1}{3} \times a^2 \times 5$<br>$\Rightarrow a^2 = 576 \Rightarrow a = 24 \text{ cm}$<br>ii) Slant height (l) = $\sqrt{12^2 + 5^2} = 13 \text{ cm}$<br>iii) T.S.A. = $(24)^2 + 2 \times 24 \times 13$<br>$= 576 + 624 = 1200 \text{ cm}^2$ | 1<br>1<br>1 |
|    | c  | Area of base = $576 \text{ cm}^2$<br>Area of a triangular surface = $156 \text{ cm}^2$<br>$\therefore$ Difference = $420 \text{ cm}^2$<br>or Ratio = $48 : 13$<br><i>Or, any comparison.</i>  | 1           |
| 6  | a. | Total external surfaces = 3   | 1           |
|    | b. | Height of cylindrical part = 20 cm  | 1           |
|    | c. | i) $V = \frac{22}{7} \times 7 \times 7 \times 20 + \frac{2}{3} \times \frac{22}{7} \times 7 \times 7 \times 7$<br>ii) $= 3080 + 718.67$<br>$= 3798.67 \text{ cm}^3$   | 1<br>1      |
| 7  | a. | i) Area of parking = $160 \text{ m}^2 = 1,600,000 \text{ cm}^2$<br>Area of one stone = $625 \text{ cm}^2$<br>ii) Total stones = $\frac{1,600,000}{625} = 2,560$   | 1<br>1      |
|    | b. | i) Total cost of stone = Rs. 51,200<br>Workers' cost = Rs. 10,800<br>ii) $\therefore$ Total cost = Rs. 62,000   | 1<br>1      |
| 8  | a. | $S_n = \frac{n}{2} \{ 2a + (n-1)d \}$   | 1           |
|    | b. | i) For $50 = \frac{5}{2} \{ 2 \times 12 + 4d \}$<br>ii) Common difference (d) = -1  | 1<br>1      |
|    | c. | i) Required three terms are: 12, 6 and 3<br>ii) Ratio: $\frac{6}{12} = \frac{3}{6} = \frac{1}{2}$<br>$\therefore$ It is a geometric series  | 1<br>1      |
| 9  | a. | Correct definition of quadratic equation  | 1           |
|    | b. | i) For two conditions:<br>$x = 6y$ and $(x+5)(y+5) = 350$<br>ii) Quadratic equation: $6y^2 + 35y - 325 = 0$   | 1<br>1      |
|    | c. | Age of son = 5 years and father = 30 years<br>$\therefore$ Son was born in B.S. 2070  | 1<br>1      |
| 10 | a. | i) $= \frac{1}{x-y} - \frac{x+y}{(x-y)(x+y)}$<br>ii) $= 0$  | 1<br>1      |
|    | b. | i) Let, $5^x = a$ . Then $a^2 - 30a + 125 = 0$<br>ii) $(a - 5)(a - 25) = 0$<br>iii) $x = 1, 2$  | 1<br>1<br>1 |
| 11 | a. | Areas of $\Delta PRS$ and $\Delta PRT$ are equal  | 1           |
|    | b. | Area of $\Delta PRS =$ Area of $\Delta PRT$ (given in a.)<br>$\therefore$ Add Area of $\Delta PQR$ on both sides  |             |

|               |  | Ar. of $\triangle PQT$ = Area of quad. PQRS  | 1           |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
|---------------|--|--|-------------|---|------|-------|---|---|-------|---|---|---------------|-------------|----|-------|-------------|----|-------|-------------|----|-------|---|----|---------------|--|--|--|
|               | c.   | <b>i)</b> Area of $\triangle PRS$ = Area of $\triangle PRT$ :<br>$\triangle PRS - \triangle POR = \triangle PRT - \triangle POR$<br><b>ii)</b> Ar. of $\triangle POS$ = Ar. of $\triangle ROT$   | 1<br>1      |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
| 12            | a.   | $\angle LOM = 2\angle LNM$ or $\angle LNM = \frac{1}{2}$ of $\angle LOM$   | 1           |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
|               | b.   | <b>i)</b> For arc KN = arc LM with reason<br><b>ii)</b> KN = LM with reason.   | 1<br>1      |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
|               | c.   | <b>i)</b> Correct figure with naming.<br><b>ii)</b> Correct measurement with conclusion.   | 1<br>1      |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
| 13            | a.   | <b>i)</b> Construction of $\triangle ABC$<br><b>ii)</b> For $\angle EFC = 60^\circ$<br><b>iii)</b> Construction of FCDE  | 1<br>1<br>1 |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
|               | b.   | length of base either half or double or any reason   | 1           |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
| 14            | a.   | Correct definition of angle of elevation   | 1           |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
|               | b.   | For correct diagram.<br>   | 1           |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
|               | c.   | $\tan 60^\circ = \frac{\text{Height of house}}{10}$<br>Height of house = $10\sqrt{3}$ m $\approx$ 17.32 m  | 1           |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
|               | d.   | Angle of elevation = $30^\circ$  | 1           |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
| 15            | a.   | Mode = $L + \frac{f_0 - f_1}{f_0 + f_1} \times i$  | 1           |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
|               | b.   | <table border="1" data-bbox="550 1438 1066 1818"> <thead> <tr> <th>x</th> <th>f</th> <th>c.f.</th> </tr> </thead> <tbody> <tr> <td>20-30</td> <td>3</td> <td>3</td> </tr> <tr> <td>30-40</td> <td>4</td> <td>7</td> </tr> <tr> <td>40-50 (modal)</td> <td>6 (<math>f_0</math>)</td> <td>13</td> </tr> <tr> <td>50-60</td> <td>7 (<math>f_1</math>)</td> <td>20</td> </tr> <tr> <td>60-70</td> <td>3 (<math>f_2</math>)</td> <td>23</td> </tr> <tr> <td>70-80</td> <td>2</td> <td>25</td> </tr> <tr> <td><b>N = 25</b></td> <td></td> <td></td> </tr> </tbody> </table> | x           | f | c.f. | 20-30 | 3 | 3 | 30-40 | 4 | 7 | 40-50 (modal) | 6 ( $f_0$ ) | 13 | 50-60 | 7 ( $f_1$ ) | 20 | 60-70 | 3 ( $f_2$ ) | 23 | 70-80 | 2 | 25 | <b>N = 25</b> |  |  |  |
|               | x  | f  | c.f.        |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
|               | 20-30  | 3  | 3           |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
|               | 30-40  | 4  | 7           |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
| 40-50 (modal) | 6 ( $f_0$ )  | 13   |             |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
| 50-60         | 7 ( $f_1$ )  | 20   |             |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
| 60-70         | 3 ( $f_2$ )  | 23   |             |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
| 70-80         | 2  | 25   |             |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
| <b>N = 25</b> |  |  |             |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
|               | <b>i)</b> Mode = $50 + \frac{6 - 7}{6 + 3} \times 10$<br>$= 50 + 2 = 52$   | 1<br>1   |             |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
| c.            | <b>i)</b> Median lies in 40 - 50 class<br><b>ii)</b> Md = $40 + \frac{13 - 7}{13 + 20} \times 10$<br>$= 40 + 9.17 = 49.17$ | 1<br>1   |             |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |
| d.            | Ratio = 7 : 12 or 5 more or less   | 1  |             |   |      |       |   |   |       |   |   |               |             |    |       |             |    |       |             |    |       |   |    |               |  |  |  |

|    |    |  |        |
|----|----|--|--------|
| 16 | a. | $P(A \cap B) = P(A) \times P(B)$   | 1      |
|    | b. | i. Tree diagram for 1 <sup>st</sup> drawn<br>ii. Tree diagram for 2 <sup>nd</sup> drawn  | 1<br>1 |
|    | c. | $P(RR) = \frac{2}{5} \times \frac{1}{4} = \frac{2}{20} = \frac{1}{10}$   | 1      |
|    | d. | Comparison:<br>$P(RR) + P(WW) = \frac{2}{20} + \frac{6}{20} = \frac{8}{20}$<br>$P(RW) + P(WR) = \frac{6}{20} + \frac{6}{20} = \frac{12}{20}$<br>$\therefore$ Comparison ratio = 8:12 = 2:3 or $\frac{1}{5}$ less | 1      |