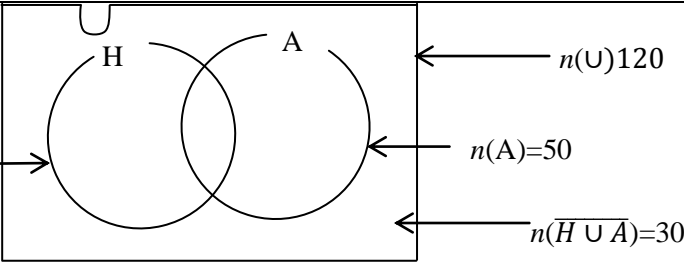


SEE - 2081 (2025)

अनिवार्य गणित

उत्तर कुञ्जिका

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	$n(\overline{HUA}) = 30$	1
	b	For Correct Venn-diagram 	1
	c	(i) $n(H \cup A) = 120 - 30 = 90$ (ii) $n(H \cap A) = 70 + 50 - 90 = 30$ (iii) $n_o(H) + n_o(A) = 40 + 20 = 60$	1 1 1
	d	$n(H) : n(A) = 80 : 50 = 8 : 5$	1
2	a	Interest paid = Rs. 28,980	1
	b	i. $28,980 = 2,00,000 \left[\left(1 + \frac{7}{100} \right)^T - 1 \right]$	1
		ii. $T = 2$ years	1
	c	C.A. = $2,00,000 \left(1 + \frac{6}{100} \right)^2 = \text{Rs. } 2,24,720$	1
3	a	Here P denotes for present (initial) population.	1
	b	The population in village A after 1 year $= 4500 \left(1 + \frac{2}{100} \right)^1 + 200 = 4700$	1
		(i) The population of village B after 2 years $= 5000 \left(1 - \frac{2}{100} \right)^2$	1
	(ii) Total population = 4802	1	

4	a	Buying rate	1
	b	(i) Nepali currency for \$ 2500 = Rs. $127.35 \times 2,500$ = Rs. 3,18,375	1
		(ii) American dollars for Rs. 3,18,375 = \$ $\frac{318375}{127.95}$ = \$ 2488.28 Loss = \$2500 – \$ 2488.27 = \$ 11.73	1
	c	(i) IRs. 1,20,000 = NRs. $\frac{160 \times 120000}{100}$ = NRs. 1,92,000 (ii) NRs. 1,92,000 = \$ $\frac{1}{127.35} \times 1,92,000$ = \$ 1507.65 \therefore IRs. 1,20,000 = \$ 1507.65 NB: Solution from correct chain rule is also acceptable.	1 1
5	a	Area of triangular surfaces of pyramid = $2al$	1
	b	Volume of pyramid (V) = $\frac{1}{3} \times (6m)^2 \times 4m = 48m^3$	1
	c	(i) Slant height (s) = $\sqrt{3^2 + 4^2} = 5$ m (ii) T.S.A. of pyramid = $6^2 + 2 \times 6 \times 5 = 96$ m ²	1 1
6	a	Height of hemisphere = Radius of hemisphere	1
	b	(i) Slant height of cone (l) = $\sqrt{12^2 + 5^2} = 13$ cm	1
		(ii) T.S.A. of solid = $2\pi r^2 + \pi rl = \frac{22}{7} \times 5(2 \times 5 + 13) = 361.43$ cm ²	1
		(iii) T.S.A. = 361.43 cm ²	1
c	Cost to color = 40 paisa \times 361.43 = Rs. 144.57 \therefore Rs. 150 is sufficient to color	1	
7	a	(i) Total area of four walls, floor and ceiling = $2 \times 9(12+8) + 2 \times 12 \times 8$	1
		(ii) Total area = 552 sq. ft.	1
	b	(i) Area of four walls excluding the doors and windows = $2 \times 9 \times (12+8) - 2(2.5 \times 3) - 2(6 \times 2) = 321$ sq. ft.	1
		(ii) The cost of coloring is more by Rs. $(56,175 - 50,000) =$ Rs. 6,175	1
8	a	Arithmetic mean \geq Geometric mean	1

	b	(i) Total number of slippers are sold up to 8 th days (S_8) (ii) $S_n = \frac{8}{2} \{2 \times 3 + (8 - 1) \times 3\} = 4(6 + 21) = 108$	1 1
	c	(i) Total number of shoes up to 8 th days (S_8) = $\frac{2(2^8-1)}{2-1} = 510$ (ii) Ratio of shoes and slippers = $510 : 108 = 85 : 18$	1 1
9	a	(i) $l \times b = 150$ and $2(l + b) = 50$ (ii) $l^2 - 25l + 150 = 0$ or, $(l - 15)(l - 10) = 0$ (iii) $l = 15$ m & $b = 10$ m	1 1 1
	b	(i) $(15 - x)(10 - x) = 84$ (ii) $(x - 22)(x - 3) = 0$ Equal part to be subtracted = 3 m	1 1
10	a	$\frac{1}{x^{-6}} = x^6$	1
	b	(i) $\frac{a^2}{a-2b} - \frac{4b^2}{a-2b}$ (ii) $\frac{a^2 - 4b^2}{a-2b} = a + 2b$	1 1
	c	(i) $4^{x-2} = 4^{-1}$ (ii) $x - 2 = -1 \quad \therefore x = 1$	1 1
11	a	Area of parallelogram = $2 \times$ Area of triangle	1
	b	(i) Area of $\triangle ABE = \frac{1}{2}$ Area of parm. ABDE Area of $\triangle BCD = \frac{1}{2}$ Area of parm. BCDE $\therefore \triangle ABE = \triangle BCD$ (ii) $\triangle ABE = \frac{1}{3}$ Area of trap. ACDE	1 1
	c	Area of $\triangle ABE = \frac{1}{3}$ Area of trap. ACDE	1
12	a	$\angle PSQ = \angle PRQ$	1
	b	(i) For correct figure of two circles with radii more that 3cm. (ii) Correct measurement with table and conclusion.	1 1
	c	(i) $\angle PSR + \angle PQR = 180^\circ$ [With reason]	1

		(ii) $\angle PQR + \angle RQT = 180^\circ$ [With reason] $\therefore \angle PSR = \angle RQT$	1
13	a	(i) Construction of quadrilateral PQRS (ii) Construction of line parallel to SQ through the point R. (iii) Construction of ΔPST	1 1 1
	b	$\Delta QSR = \Delta SQT$ with reason $\Delta QSR + \Delta PQS = \Delta SQT + \Delta PQS$ \therefore Quad. PQRS = ΔPST	1
14	a	Angle of elevation	1
	b	$DE = 5\sqrt{3}$ m	1
	c	$BE = 15$ m	1
	d	$\angle DAC = 60^\circ$	1
15	a	Model class = 30 – 40	1
	b	(i) Q_1 class = 12.5 th term = 20 – 30	1
		(ii) Value of $Q_1 = 20 + \frac{12.5-7}{13} \times 10 = 24.23$	1
	c	(i) $\sum fm = 1680$ and $N = 50$	1
(i) Mean $(\bar{X}) = \frac{1680}{50} = 33.6$		1	
d	Average marks of last two classes = $\frac{450 + 275}{15} = 48.33$		1
16	a	$P(A \cup B) = P(A) + P(B)$	1
	b	<p style="text-align: center;"> $\underbrace{\hspace{10em}}_{1st\ draw} \qquad \qquad \qquad \underbrace{\hspace{10em}}_{2nd\ draw}$ 1 1 </p>	1 1

		<i>N.B.: Way of drawing figure may vary.</i>	
c		$P(WW) = \frac{3}{8} \times \frac{2}{7} = \frac{3}{28}$	1
d		<p>With replacement, $P(WW) = \frac{3}{8} \times \frac{3}{8} = \frac{9}{64}$</p> <p>$\therefore$ Difference = $\frac{9}{64} - \frac{3}{28} = \frac{15}{448}$</p>	1