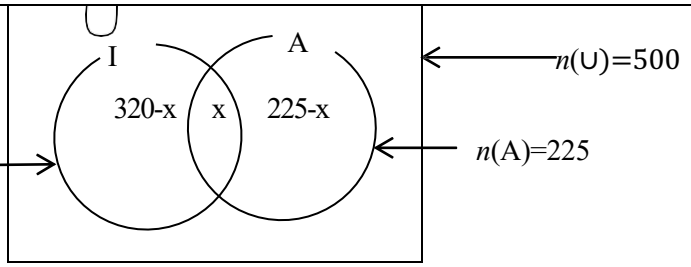
SEE - 2082 (2026)

अनिवार्य गणित

उत्तरकुञ्जिका

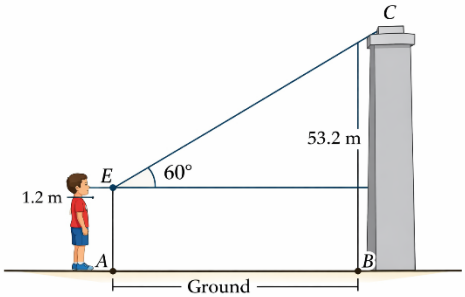
अन्य बैकल्पिक तरिकाबाट समस्या समाधान गरेमा पनि अङ्क प्रदान गर्नुपर्ने छ । उत्तरकुञ्जिकामा प्रत्येक चरणको प्राप्ताङ्क १ भएतापनि विद्यार्थीहरुले आंशिक समाधान गरेको अवस्थामा तथा सामान्य कुराहरू (जस्तैः एकाइ) छुट हुन गएमा समेत ०.५ अङ्क प्रदान गर्नुपर्नेछ ।

प्र.नं.	उपप्र. न.	उत्तर	अङ्क
1	a	n(I)= 320 [1 mark]	1
	b	For Correct Venn-diagram 	1
	c	From Venn diagram: 320 - x + x + 225 - x = 500 *[1 mark]* $\Longrightarrow$ 545 - x = 500 $\therefore$ x = 45 *[1 mark]* $\therefore$ $n_0(I) + n_0(A) = (320 - 45) + (225 - 45)$ = 275 + 180 = 455 *[1 mark]*	1+1+1
	d	Students who like neither: $(\frac{95}{275}) \times 100\% = 34.55\%$ less [1 mark]	1
2	a	Formula: *[1 mark]* $C.I. = P[(1 + \frac{R}{100})^T - 1]$	1
	b	C.I. at 2 years: $C.I. = 70{,}000[(1 + \frac{6}{100})^2 - 1]$ *[1 mark]* = Rs. 8652 *[1 mark]*	1+1
	c	Simple Interest at 2 years: S.I. = Rs. 8400 *[1 mark]* Comparison: Rs. 252 more (compound interest) *[1 mark]*	1+1

3	a	Correct definition *[1 mark]*	1
	b	Price after 2 years: Price = 1,60,000 × $[1 - \frac{20}{100}]^2$ *[1 mark]* = 1,60,000 × $(0.8)^2$ = 1,60,000 × 0.64 = Rs. 1,02,400 *[1 mark]*	1 1
	c	Depreciated price = Rs. 57,600 *[1 mark]*	1
4	a	\$500 = NRs 500 × 133.17 = NRs 66,585 *[1 mark]*	1
	b	New buying rate: New buying rate = 132.57 × 1.005 = NRs 133.23285 *[1 mark]*	1
	c	New selling rate = NRs 133.83585 ∴ \$500 = NRs 500 × 133.83585 *[1 mark]* = NRs 66,917.925 *And* NRs 332.925 more *[1 mark]*	1+1
5	a	Number of surfaces = 5	1
	b	Vertical height (h): h = √[$(25)^2$ - $(24)^2$] = √[625 - 576] = √49 = 7 cm *[1 mark]* Volume (V) = ⅓ × 48 × 48 × 7 *[1 mark]* = 5376 cm^3 *[1 mark]*	1+1+1
	c	Area of a triangular surface: = ½ × 48 × 25 = 600 cm^2 *[1 mark]*	1
	a	Slant height formula: *[1 mark]* $l = \sqrt{(h^2 + r^2)}$, or $l^2 = h^2 + r^2$	1

6			
	b	Volume of tank: Volume = 1.54 × (3.2 + ⅓ × 2.4) *[1 mark]* = 6.16 m³ = 6160 litres *[1 mark]*	1+1
	c	Radius from base area: 1.54 m² = $(\frac{22}{7}) \times r^2 \implies r = 0.7$ m Slant height of cone = 2.5 m *[1 mark]* C.S.A of cone = $(\frac{22}{7}) \times 0.7 \times 2.5 = 5.5$ m² ∴ Comparison: 3.96 m² more or less *[1 mark]*	1+1
7	a	Area of land: = ½ × (40 + 70) × 20 = 1100 ft² *[1 mark]* Total number of turps = 1100 / 4 = 275 *[1 mark]*	1+1
	b	Cost of turfs: Cost = 150 × 275 = Rs. 41,250 ∴ Rs. 40,000 is NOT sufficient *[1 mark]*	1
8	a	Geometric sequence *[1 mark]*	1
	b	Sum of 10 terms: $S_{10} = \frac{a(r^n-1)}{r-1} = \frac{100(2^{10}-1)}{2-1}$ *[1 mark]* = 100 × 1023 = 1,02,300 *[1 mark]*	1+1
	c	Finding n: $\frac{100(2^3-1)}{100(2^n-1)} = \frac{7}{255}$ *[1 mark]* $\implies \frac{8-1}{2^n-1} = \frac{7}{255}$ $\implies \frac{7}{(2^n-1)} = \frac{7}{255}$ $\implies 2^n - 1 = 255 \implies 2^n = 256 = 2^8$ ∴ n = 8 *[1 mark]*	1+1
	a	$ax^2 + bx + c = 0,\ a \neq 0$ *[1 mark]*	1

9	b	Setting up equations: $xy = 24$ and $10x + y + 45 = 10y + x$ $\Longrightarrow x - y = -5 \Longrightarrow y = x + 5$ *[1 mark]* $x(x + 5) = 24 \Longrightarrow x^2 + 5x - 24 = 0$ *[1 mark]*	1+1
	c.	Solving: $x = -8$ or 3, $y = 8$ *[1 mark]* $\therefore$ Required number $= 10 \times 3 + 8 = 38$ *[1 mark]*	1
10	a	Simplify: $\frac{1}{1+\frac{1}{a}} + \frac{1}{1-\frac{1}{a}}$ $= \frac{a}{a+1} + \frac{a}{a-1}$ *[1 mark]* $= \frac{[a(a-1)+a(a+1)]}{[(a-1)(a+1)]}$ $= \frac{[a^2-a+a^2+a]}{a^2-1}$ $= \frac{2a^2}{a^2-1}$ *[1 mark]*	1+1
	b	Solve: $(2^x)^2 - 3 \times 2^x \times 2 + 8 = 0$ Let $2^n = a$: $a^2 - 6a + 8 = 0$ *[1 mark]* $a = 2$ or $a = 4$ *[1 mark]* $\therefore$ $n = 1$ or $n = 2$ *[1 mark]*	1+1+1
11	a	Area of $\triangle QRS$ = ½ × area of □PRSY *Or: area of □PRSY = 2 × Ar. of $\triangle QRS$*	1
	b	Area of $\square$PRSY: Ar. of $\square$PRSY = RS × height *[1 mark]* Ar. of $\square$XRSQ = RS × height $\therefore$ Ar. of $\square$PRSY = Ar. $\square$XRSQ (Proved) *[1 mark]*	1+1
	c	Construction of $\triangle ABC$ *[1 mark]* Construct ED = 6.5 cm *[1 mark]*	1+1+1

		Construction of ▱BDEF *[1 mark]*	
12	a	∠AEC = ∠ADC or equal angles *[1 mark]*	1
	b	Solving for x: 5x - 9 + 3x + 5 = 180 8x - 4 = 180 ⟹ 8x = 184 x = 23 *[1 mark]*	1
	c	Correct figure with naming *[1 mark]* Correct measurement *[1 mark]*	1+1
13	a	Area of ΔQRT = Ar. ΔRUT *[1 mark]* Area of ΔQRT = ½ × Ar. of □PQRS ∴ Ar. of ΔQRU = Ar. of □PQRS *[1 mark]*	1+1
	b	Proof: □PQRS = ΔQTR + ΔPQT + ΔRST 2ΔQTR = ΔQTR + ΔPQT + ΔRST ∴ ΔQTR = ΔPQT + ΔRST *[1 mark]*	1
14	a	Correct definition *[1 mark]*	1
	b	Correct figure (as alongside): [1mark] 	1
	c	Distance calculation: $\tan 60° = \frac{52}{ED}$ ∴ ED = $\frac{52}{tan60}° = \frac{52}{\sqrt{3}} \approx 30.02$ m *[1 mark]*	1
	d	21.98 m more [1mark]	1

	a	l = lower limit of median class *[1 mark]*	1
	b	Median: x | f | c.f. | m | fm 0-10 | 6 | 6 | 5 | 30 10-20 | 4 | 10 | 15 | 60 20-30 | 5 | 15 | 25 | 125 30-40 | 4 | 19 | 35 | 140 40-50 | 11 | 30 | 45 | 495 Total | 30 | | | Σfm = 850 Median lies in 20-30 class (c.f. = 10) *[1 mark]* Md = 20 + [(15 - 10)/5] × 10 = 30 (1mark) *Or any alternative method.*	1+1
15	c	Mean: Mean($\bar{x}$) = $\frac{\Sigma fm}{N}$, where Σfm = 850 *[1 mark]* ∴ Mean/Average = $\frac{850}{30}$ = 28.33 *[1 mark]*	1+1
	d	New average: For new Σfm = 850 + (55 × 2) = 960 ∴ New average = $\frac{960}{32}$ = 30 *[1 mark]*	1

16	a b	P(A∩B) =P(A)×P(B) [1mark] *First drawing [1 mark]* *Second drawing [1 mark]* *N.B.: Way of drawing figure may vary.*	1 2
	c	P(same colour): $P(RR) + P(WW) = (\frac{6}{11} \times \frac{5}{10}) + (\frac{5}{11} \times \frac{4}{10})$ $= \frac{30}{110} + \frac{20}{110}$ $= \frac{50}{110} = \frac{5}{11}$ *[1 mark]*	1
	d	P(different colour): $P(RW) + P(WR) = (\frac{6}{11} \times \frac{5}{10}) + (\frac{5}{11} \times \frac{6}{10})$ $= \frac{30}{110} + \frac{30}{110} = \frac{60}{110} = \frac{6}{11}$ ∴ Ratio P(same) : P(different) = 50 : 60 = 5 : 6 *[1 mark]*	1