

FOUNDATION(V₂)

①

Class: VI, MATHEMATICS

2. ARITHMETIC RATIOS

01. option C: $20 : 32 = 5 : 8$
 $32 - 20 = 12$

Ans: C

02. $63 : x = 9 : 8$
 $\Rightarrow x = \frac{63 \times 8}{9} = 56 \text{ Kg.}$

Ans: D

03. $\frac{1}{7} = 0.14$, $\frac{27}{63} = 0.42$, $\frac{16}{56} = 0.28$
Greatest = $\frac{27}{63}$

Ans: A

04. $3 : 5 = x : 2,500$
 $\Rightarrow x = \frac{3 \times 12,500}{5} = \text{Rs } 7,500$

Ans: C

05. let a, b, c be the three parts of 414
Given $a = \frac{2}{3} \times b \Rightarrow a : b = 2 : 3$

also $b : c = 5 : 7$

$\therefore a : b : c = 10 : 15 : 21$

Now, third part = $\frac{21}{46} \times 414 = 189$.

Ans: B

06. $l : m = 2\frac{1}{2} : 1\frac{2}{3} = \frac{5}{2} : \frac{5}{3} = \frac{5}{2} \times \frac{3}{5} = 3 : 2$

$m : n = 1\frac{1}{4} : 3\frac{1}{2} = \frac{5}{4} : \frac{7}{2} = \frac{5}{4} \times \frac{2}{7} = 5 : 14$

$l : m : n = 15 : 10 : 28$

Ans: C



07. $\left. \begin{array}{l} 3.5 : 2^5 \\ 4 : 2^5 \\ = 4^{7/2} : 2^5 \end{array} \right| = \left(\frac{2}{2} \right)^{7/2} : 2^5 \Bigg| = 2^2 : 1 = 4 : 1$ ②
 AM: B

08. $\left. \begin{array}{l} 2A = 3B \\ \Rightarrow \frac{A}{B} = \frac{3}{2} \\ \Rightarrow A:B = 3:2 \end{array} \right| \begin{array}{l} 4B = 5C \\ \Rightarrow \frac{B}{C} = \frac{5}{4} \\ \Rightarrow B:C = 5:4 \end{array} \Bigg| \therefore A:B:C = 15:10:8$
 $A:C = 15:8$
 AM: C

09. Let the numbers be a, b, c
 Given $a:b:c = 3:4:5$
 Let $a = 3x, b = 4x, c = 5x$
 Given $a^2 + b^2 + c^2 = 1250$
 $\Rightarrow (3x)^2 + (4x)^2 + (5x)^2 = 1250$
 $\Rightarrow x = 5$
 $\therefore a + b + c = 3x + 4x + 5x = 12x = 12 \times 5 = 60$
 AM: C

10. option Verification method.

option: C: 3:4

Since $3x + 4x = 72 \Rightarrow x = \frac{72}{7}$, Not an Integer
 AM: C

JEE ADVANCED

11. Given ratio = $\frac{2}{7}$
 Let the no. be $2x, 7x$
 Given $7x - 2x = 40$
 $\Rightarrow x = 8$

$2x = 16, 7x = 56$
 Ratio = $16:56$
 Duplicate ratio = $16^2:56^2 = 4:49$
 $32:112 = 2:7$
 AM: A, B

12. Let $A \rightarrow$ Broken mirrors
 $B \rightarrow$ Unbroken mirrors
 given $A+B=12$

opt: A $A:B = 2:1 \Rightarrow A=2x, B=x$
 $A+B=12$
 $\Rightarrow 2x+x=12 \quad \left| \quad x=4 \text{ (+ve integer)} \checkmark$

opt: B $A:B = 3:1$
 $\Rightarrow x+x=12$
 $\Rightarrow x=3 \text{ (+ve integer)} \checkmark$

opt: C $A:B = 3:2$
 $3x+2x=12$
 $\Rightarrow x=\frac{12}{5} \text{ (Not an integer)} \times$

opt: D $A:B = 7:5$
 $\Rightarrow 7x+5x=12$
 $\Rightarrow x=1 \text{ (+ve integer)} \checkmark$ Ans: A, B, D

13 Statement I: Triplicate ratio of $3:7$
 $= 3^3:7^3 = 27:343 \text{ (True)}$

Statement II: Conceptual (True) Ans: A

14 Statement I: Boys: Girls = $5:3$
 Girls: total = $3:8 \text{ (True)}$

Statement II: Boys: Girls = $5:3$
 Boys: total = $5:8 \text{ (True)}$

Ans: A

15. Assertion: Conceptual (True)

Reason: Conceptual (True)

Ans: A

16. Assertion: $3:4 \neq 4:3$ (False)

Reason: Conceptual (True)

Ans: D

17. Given $2:3$, $6:11$, $11:12$

Compound ratio: $2 \times 6 \times 11 : 3 \times 11 \times 12$
 $= 1:3$

Ans: A

18. Duplicate ratio of $2:3 = 2^2:3^2 = 4:9$

Ans: C

19. Given $A:B = 7:9$.

Given A's salary = Rs 14,000

$$\therefore 7x = 14,000$$

$$\Rightarrow x = 2000$$

$$B's \text{ salary} = 9x = 9 \times 2000 = \text{Rs } 18,000$$

Ans: B

20. Total Salary = $14,000 + 18,000$
 $= \text{Rs } 32,000$

Ans: B

21. Given $P:Q = 2:3$, $Q:R = 2:3$, $R:S = 2:3$

$$\therefore P:Q:R = 4:6:9, P:Q:R:S = 8:12:18:27$$

$$P's \text{ share} = \frac{8}{65} \times 1300 = \text{Rs } 160$$

Ans: 160

22. Let No. of 25p coins $\rightarrow x$

10p coins $\rightarrow 2x$

5p coins $\rightarrow 3x$

$$\text{Given } 25x + 10 \times 2x + 5 \times 3x = 3000$$

$$\Rightarrow x = 50$$

$$\therefore \text{No. of 5p coins} = 3x = 3 \times 50 = 150 \quad \text{Ans. 150}$$

23 a) $a:b:c = 5:9:15 \Rightarrow x = 5 (p)$

b) $\frac{1}{7} : \frac{1}{x} = \frac{1}{2x} : \frac{1}{14}$

$$\Rightarrow \frac{1}{2x^2} = \frac{1}{7 \times 14} \Rightarrow x = 7 (r)$$

c) $a:b:c = 3:4:5$

$$abc = 3x \cdot 4x \cdot 5x = 60x^3 = 60000$$

$$\Rightarrow x = 10$$

$$\therefore \text{First no} = 3x = 3 \times 10 = 30$$

$$\text{Given } 5y = 30 \Rightarrow y = 6 (t)$$

d) $(a+b) + (b+c) + (c+a) = 6x + 7x + 8x = 21x$

$$\Rightarrow 2(a+b+c) = 21x$$

$$\Rightarrow 2 \times 14 = 21x \Rightarrow x = \frac{4}{3}$$

$$\text{Now, } a+b = 6x = 6 \times \frac{4}{3} = 8$$

$$c+a = 8x = 8 \times \frac{4}{3} = \frac{32}{3}$$

$$\text{Now, } a+b+c = 14 \quad | \quad c = 6 (t)$$

$$\Rightarrow 8+c = 14$$

(6)

$$e) a:b=1:2 \Rightarrow b=2a$$

$$\text{Given } a+7:b+7=3:5$$

$$\Rightarrow 3(b+7) = 5(a+7)$$

$$\Rightarrow 3(2a+7) = 5(a+7) \Rightarrow a=14 (s)$$

Ans: p, r, t, t, s

24. a) Boys: Girls = 20:30 = 2:3 (P)

b) pens: pencils = 15:25 = 3:5 (Q)

c) saving: Earning = ~~60:40~~
= 20:60 = 1:3 (S)

d) oranges: Apples = 20:12 = 5:3 (—)

Ans: p, q, s, —

LEARNERS TASK (CUES)

01. UNIFIED COUNCIL

Consonants = { N, F, D, C, N, C, L } $\rightarrow 7$

Vowels = { I, U, I, E, O, U, I } $\rightarrow 7$

$$\therefore \text{Ratio} = 7:7 = 1:1$$

Ans D

02. 11:20 = 11:(11+9)

= Magazines: total

Ans: D

03. $\frac{a}{b} = a:b$

Ans: A

04. Doesn't Change

Ans: D

05. 30:36 = 5:6

Ans: B

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06	5:4	Ans: D
07	$2\text{ Kg} : 900\text{ gm}$ $= 2000\text{ gm} : 900\text{ gm}$ $= 20:9$	Ans: C
08	$2:3 = 6:9$	Ans: C
09	Largest angle $= \frac{3}{6} \times 180^\circ = 90^\circ$	Ans: C
10	$384 : 480 = 4:5$	Ans: C

JEE MAINS LEVEL

01.	perimeter $2x + 3x + 5x = 100$ $\Rightarrow x = 10$ Smallest side $= 2x = 2 \times 10 = 20\text{ cm}$	Ans: B
02	$a:b = 7:9 \mid 7x + 9x = 112$ $2x + 3x$ $\Rightarrow x = 7$ Larger number $= 9x = 9 \times 7 = 63$	Ans: A
03	let C get = Rs x B gets = Rs $2x$ A gets = Rs $4x$ $A's \text{ share} = \frac{4}{7} \times 31500 = \text{Rs } 18000$ $B's \text{ share} = \frac{2}{7} \times 31500 = \text{Rs } 9000$ $C's \text{ share} = \frac{1}{7} \times 31500 = \text{Rs } 4500$	Ans: A



04. Speed of Bus = $\frac{126}{3} = 42 \text{ km/hr}$
 Speed of train = $\frac{315}{5} = 63 \text{ km/hr}$
 Ratio = $42:63$
 $= 2:3$

Ans: B

05. $m:F = 5:3$
 Given $5x = 115$
 $\Rightarrow x = 23$

Female = $3x$
 $= 3 \times 23$
 $= 69$

Ans: C

06. $l:b = 5:3$
 Given $bx = 42$
 $x = 14$

length = $5x$
 $= 5 \times 14$
 $= 70 \text{ cm}$

Ans: B

07. $\frac{A}{B} : \frac{B}{C} : \frac{C}{A} = \frac{2}{3} : \frac{3}{4} : \frac{4}{2}$

LCM $\{3, 4, 2\} = 12$

$= 8:9:24$

Ans: D

08. $A:B = 2:3, B:C = 4:5$

$A:B:C = 8:12:15 \Rightarrow A:B:C = 16:24:30$

$C:D = 6:7 \Rightarrow C:D = 30:35$

$\therefore A:B:C:D = 16:24:30:35$

Ans: C

009

09. Given $R:S = 2:3$

(5)

Ravi's salary = $Rs\ 2x$, Sumit salary = $3x$

$$(2x + 4000) : (3x + 4000) = 40:57$$

$$\Rightarrow x = \frac{34000}{3}$$

$$\text{Sumit's salary} = 3x = 3 \times \frac{34000}{3}$$

$$= Rs\ 34000$$

Ans. D

10

$$\frac{x}{y} = \frac{4}{5}$$

Option D: $\frac{2x^2 - y^2}{xy} = \frac{2 \cdot 16 - 25}{4 \cdot 5} = \frac{7}{20}$ (False)

Ans. D

JEE ADVANCED

11. Triplicate ratio of $4:3 = 4^3:3^3$
 $= 64:27$

Given $(5x+3) : (3x+1) = 64:27$

$$\Rightarrow x = \frac{17}{57}$$

$$\Rightarrow 1-x = \frac{40}{57}$$

Ans: A, D

12

$$\frac{45}{60} = \frac{3}{4}$$

Ans: A, B



13. Statement I: Conceptual (True)

Statement II:

$$\text{Compound ratio} = \frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} = 1:4 \text{ (True)}$$

Ans: A

14. Statement I: $\frac{80}{120} = \frac{2}{3}$ (True)

Statement II: $\frac{24}{36} = \frac{2}{3}$ (False)

Ans: C

15. Assertion: Conceptual (True)

Reason: Conceptual (True)

Ans: A

16. Assertion: Conceptual (False)

Reason: Conceptual (True)

Ans: D

17. Income : Expenditure = 1274 : 1078
 $= 637 : 539$
 $= 13 : 17$

Ans: A

18. Saving = 1274 - 1078 = Rs 196

Income : Saving = 1274 : 196
 $= 13 : 2$

Ans: C

19. Ratio of numbers = 5 : 7

Sum = $5x + 7x = 72 \Rightarrow x = 6$

Smaller number = $5x = 5 \times 6 = 30$

Ans: C

20. Larger number = $7x = 7 \times 6 = 42$

Ans: B



21. $Z:C = 1:4$

$$Z+C = x+4x = 5x = 12\frac{1}{2} = \frac{25}{2}$$

$$\Rightarrow x = \frac{5}{2}$$

$$C_{\text{upor}} = 4x = 4 \times \frac{5}{2} = 10 \text{ kg}$$

Ans: 10

22 a) $150:350 = 3:7$ (q)

b) $100:15 = 20:3$ (r)

c) 2 scores: 3 dozens = $2 \times 20 : 3 \times 12$
 $= 10:9$ (s)

d) $240 \text{ mt} : 1\frac{1}{5} \text{ km}$

$$= 240 \text{ mt} : \frac{6}{5} \times 1000 \text{ mt}$$

$$= 240 \text{ mt} : 1200 \text{ mt}$$

$$= 1:5$$

$$= 2:10$$
 (t)

Ans: q, r, s, t

24 a) $500 \text{ mt} : 2 \text{ km}$

$$= 500 : 2000 \text{ mt}$$

$$= 1:4$$
 (q)

b) $250 \text{ g} : 1 \text{ kg} = \frac{250:1000}{1:4}$ (q)

c) 2 hr : 30 min = $2 \times 60 \text{ min} : 30 \text{ min}$
 $= 4:1$ (s)

d) $50 \text{ cm} : 5 \text{ mt} = 50:500$
 $= 1:10$ (p)

Ans: q, q, s, p

$\Rightarrow$ TITE END $\Leftarrow$