

FOUNDATION

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Class: VIII, MATHEMATICS

8. COMPARING QUANTITIES

TEACHING TASK (JEE MAINS)

01. Two numbers = 3:4.
Let the two numbers be $3x, 4x$

$$\frac{3x+20}{4x+20} = \frac{7}{8} \Rightarrow x = 5$$

$\therefore$ The original numbers are $3 \times 5, 4 \times 5$
 $= 15, 20$ ~~Ans~~

Shortcut method:

optional Verification: option B.

$$\frac{15}{20} = \frac{3}{4}, \quad \frac{15+20}{20+20} = \frac{35}{40} = \frac{7}{8}$$

Ans: B

02. Profit = $650 - 500 = 150$.

$$\text{Profit \%} = \frac{150}{500} \times 100 = 30\%$$

Ans: C

03. M.P. = Rs 5,000, Discount = 20%.

$$S.P. = MP \times \frac{100 - D\%}{100}$$

$$= 5000 \times \frac{80}{100}$$

$$= 4000$$

Ans: B

04. $S.I. = \frac{PTR}{100} = \frac{8000 \times 3 \times 12}{100} = \text{Rs } 2880$

Ans: A

05. $A = P \left(1 + \frac{R}{100}\right)^n = 5000 \left(1 + \frac{10}{100}\right)^2 = \text{Rs } 6050$

$$C.I. = 6050 - 5000 = \text{Rs } 1050$$

Ans: B



$$06 \quad \frac{0.05}{20} \times 100 = 0.25\%$$

② Ans: C

07 let the number be x

$$\frac{x}{100} \times 75 + 75 = x \Rightarrow x = 300$$

Ans: D

08 35% of A's income = 25% of B's income

$$\Rightarrow \frac{35}{100} \text{ of } A = \frac{25}{100} \text{ of } B$$

$$\Rightarrow 7A = 5B$$

$$\Rightarrow \frac{A}{B} = \frac{5}{7} = 5:7$$

Ans: B

09 M.P. = C.P. + 20% of C.P.

$$= \text{C.P.} + \frac{20}{100} \cdot \text{C.P.}$$

$$= \frac{6}{5} \text{ CP}$$

Now, S.P. = M.P. - M.P. $\times$ 5%

$$= \text{M.P.} - \text{M.P.} \times \frac{5}{100}$$

$$= \frac{19}{20} \text{ MP}$$

$$= \frac{19}{20} \times \frac{6}{5} \text{ CP} = \frac{57}{100} \text{ CP}$$

$$\text{Profit \%} = \frac{\text{S.P.} - \text{C.P.}}{\text{C.P.}} \times 100$$

$$= \frac{\frac{57}{100} \text{ CP} - \text{C.P.}}{\text{C.P.}} \times 100$$

$$= 14\%$$

Ans: B

$$10. \text{Loss \%} = \frac{\text{C.P.} - \text{S.P.}}{\text{C.P.}} \times 100.$$

(3)

$$\Rightarrow 25 = \frac{\text{Loss}}{4,55,000 + \text{Loss}} \times 100$$

$$\Rightarrow \text{Loss} = 1,51,666.67 \text{ (Approx)}$$

Ans: D

11. let the number be x

$$10\% \text{ of } 100 = 10$$

$$\text{The new number} = 100 - 10 = 90.$$

$$20\% \text{ of } 90 = \frac{20}{100} \times 90 = 18.$$

$$\text{New number} = 90 - 18 = 72$$

$$\therefore \text{Total decrease} = 100 - 72 = 28$$

$\therefore$ As a percentage of the original number (100)
this is a 28% decrease

Ans: A

$$12. \text{One third of } 1206 = \frac{1}{3} \times 1206 = 402$$

$$\therefore 134 \times x\% = 402$$

$$\Rightarrow 134 \times \frac{x}{100} = 402$$

$$\Rightarrow x = 300\%$$

Ans: C

13. Statement I: Tax paid = 10% of Rs 2000

$$= \frac{10}{100} \times 2000 = \frac{2000}{10} = 200$$

(Tax)
(Rate)

NOTE: Here Rs 2000 is pre-tax price

Statement II:

Original Ratio: 2:3

(4)

Increase by 50%. (or 0.5)

New first part : $2 + 0.5 \times 2 = 2 + 1 = 3$

New second part = $3 + 0.5 \times 3 = 3 + 1.5 = 4.5$

New ratio: 3:4.5

$$= \frac{3}{4.5} = \frac{30}{45} = \frac{2}{3} \text{ (False)}$$

Ans: C

14 Statement I: 30% of Rs. 150

$$= \frac{30}{100} \times 150 = 45 \text{ (True)}$$

Statement II: p% of x = $\frac{p}{100} \times x$ (True)

Ans: C

15 Assertion: 20% of 250

$$= \frac{20}{100} \times 250 = 50 \text{ (True)}$$

Reason: Conceptual (True)

Ans: A

16. Assertion: profit = 960 - 800

$$= 160.$$

$$\text{profit \%} = \frac{160}{800} \times 100 = 20\% \text{ (True)}$$

Reason: Conceptual (True)

Ans: A

17. ~~$A = 5000 \left(1 + \frac{12}{100}\right)$~~

$$\begin{array}{r} 363 \\ \times 5 \\ \hline 1815 \end{array}$$

$$S.I = \frac{PTR}{100} = \frac{5000 \times 3 \times 12}{100} = \text{Rs } 1800$$

Ans: D



$$18 \quad A = P + S \cdot I$$

$$= 5000 + 1800$$

$$= \text{Rs } 6800$$

(5)

Ans. D

$$19. \text{ Profit} = 715 - 620 = \text{Rs } 95$$

Ans. —

$$20. \text{ C.P.} = \text{Profit} = C \cdot P - S \cdot P$$

$$\Rightarrow 62 = C \cdot P - 840$$

$$\Rightarrow C \cdot P = 840 + 62 = \text{Rs } 902$$

Ans. C

$$21. P_1 = 40000 \times \left(1 + \frac{12}{100}\right) = 44800$$

$$P_2 = 44800 \times \left(1 - \frac{8}{100}\right) = 41216$$

Ans: 41216

22. Initially

$$2\% \text{ of salt out of } 30 \text{ kg. solution}$$

$$= \frac{2}{100} \times 30 = 0.6 \text{ kg.}$$

Now,

$$\left(0.6 + n \frac{4}{3}\right) \text{ kg} = 10\% \text{ of } \left(30 \text{ kg} + \frac{4n}{3}\right)$$

$$\Rightarrow 0.6 + \frac{4n}{3} = \frac{10}{100} \times \left(30 + \frac{4n}{3}\right)$$

$$\Rightarrow n = 2 \text{ (Integral value)} \quad \text{Ans: 2}$$

$$23. a) P = \text{Rs } 12600, n = 2, R = 10\% \text{ of P.A.}$$

$$A = P \left(1 + \frac{R}{100}\right)^n$$

$$= 12600 \left(1 + \frac{10}{100}\right)^2 = \text{Rs } 15,246$$

$$\text{Interest} = 15,246 - 12600 = \text{Rs } 2646$$

b) $P = \text{Rs. } 18000$, $n = 2$, $R = 10\%$

(6)

$$A = P \left(1 + \frac{R}{100}\right)^n$$

$$= 18000 \left(1 + \frac{10}{100}\right)^2 = \text{Rs. } 21780$$

$$\text{Interest} = 21780 - 18000 = \text{Rs. } 3780$$

c) $P = \text{Rs. } 16000$, $n = 3$, $R = 12\frac{1}{2}\% = \frac{25}{2}\%$

$$A = P \left(1 + \frac{R}{100}\right)^n$$

$$= 16000 \left(1 + \frac{25}{2 \times 100}\right)^3$$

$$= \text{Rs. } 22781.25$$

d) $A = P \left(1 + \frac{R}{100}\right)^n$

$$= 1500 \left(1 + \frac{10}{100}\right)^2 = 1815$$

$$\text{S.I} = \frac{1815 \times 10 \times 0.5}{100} = 90.75$$

$$\text{Total Amount} = 1815 + 90.75 = 1905.75$$

$$\text{C.I} = 1905.75 - 1500 = 405.75$$

24 a) $25\% \text{ of } 360 = \frac{25}{100} \times 360 = 90(x)$

b) $\frac{12.5}{100} \times 640 = 80(y)$

c) $\frac{40}{100} \times 250 = \underline{100}$

d) $\frac{75}{100} \times 480 = \underline{360}$

LEARNERS TASK

⑦

01.	Conceptual	Ans: C
02	Conceptual	Ans: A
03	Conceptual	Ans: C
04	Conceptual	Ans: B
05	Conceptual	Ans: A
06	Conceptual	Ans: D
07	Conceptual	Ans: B
08	Conceptual	Ans: D
09	Conceptual	Ans: C
10	$SP = C.P \left(\frac{100 - \text{loss \%}}{100} \right)$	Ans: B
	$\frac{75}{100} \times 500 = \text{Rs } 375$	

JEE MAINS LEVEL

01. Let the original number be 100.

Increase by 20%.

New Number = 120.

Decrease by 20% = $\frac{20}{100} \times 120 = 24$

New Number = $120 - 24 = 96$.

Net Change = $100 - 96 = -4$.

i.e. 4% Decrease

Ans: B



02	Let the numbers be $5x, 7x$ given $\frac{5x-9}{7x-9} = \frac{4}{5} \Rightarrow x = -3$ $\therefore$ The numbers are $-15, -21$ Ans: C
03	Loss = $2400 - 2100 = \text{Rs } 300$ Loss % = $\frac{300}{2400} \times 100 = 12.5 \%$ Ans: B
04	Sales tax = 10% of $12,000 = \text{Rs } 1200$. S.P = $12000 + 1200 = \text{Rs } 13,200$. Ans: B
05	$A = 8000 \left(1 + \frac{10\frac{1}{2}}{100}\right)^{1 \times 2}$ $= 8000 \left(1 + \frac{5}{100}\right)^2 = \text{Rs } 8820$ C.I. = $8820 - 8000 = \text{Rs } 820$. Ans: C
06	S.P = 1980, $P = 10\%$. C.P = $S.P. \times \frac{100}{100 + P\%}$ $= 1980 \times \frac{100}{100 + 10} = \text{Rs } 1800$ Ans: B
07	Profit % = $\frac{S.P. - C.P.}{C.P.} \times 100$ $\Rightarrow 12.5\% = \frac{247.50 - C.P.}{C.P.} \times 100$ $\Rightarrow C.P. = \text{Rs } 220$ Ans: B
08	Let the total marks be x $\therefore 56\%$ of $x = 98$ $\Rightarrow \frac{56}{100} \times x = 98$ $\Rightarrow x = 175$ Ans: D

09. Compound ratio

(9)

$$\frac{2a}{3b} \times \frac{6ab}{5c^2} \times \frac{c}{a} = \frac{4a}{5c}$$

Ans: D

10. Let the total employees be x

$$\therefore 40\% \text{ of } x = 80$$

$$\Rightarrow \frac{40}{100} \times x = 80$$

$$\Rightarrow x = 200$$

Ans: D

JEE ADVANCED

11. No option satisfies the given conditions

Ans: D

12. S.P = Rs 810, Gain = 8%.

$$C.P = \frac{100}{100 + \text{gain}\%} \times S.P$$

$$= \frac{100}{108} \times 810$$

$$= \text{Rs } 750$$

Ans: B

13. Statement I:

$$S.I = \frac{PTR}{100} = \frac{1000 \times 2 \times 10}{100} = \text{Rs } 200. \text{ (True)}$$

Statement II:

$$A\& = 1000 \left(1 + \frac{10}{100}\right)^2$$

$$= 1000 \times \frac{11}{10} \times \frac{11}{10} = 1210$$

$$\therefore \text{Compound Interest} = 1210 - 1000$$

$$= \text{Rs } 210 \text{ (True)} \quad \text{Ans A}$$

14. Statement I: S.P. = Rs 1980, P% = 10%. (10)

$$C.P. = \frac{100 \times S.P.}{100 + P\%} = \frac{100 \times 1980}{110}$$

$$= \text{Rs } 1800 \text{ (True)}$$

Statement II: Conceptual (True)

Ans: A

15. Assertion: m.p. = Rs 2000.

$$10\% \text{ discount} = \text{Rs } 200$$

$$\text{Price after discount} = \text{Rs } 2000 - 200 = \text{Rs } 1800.$$

$$12\% \text{ Sales tax on Rs. } 1800 = \text{Rs } 216$$

$$\therefore \text{Final cost} = 1800 + 216 = \text{Rs } 2016$$

(False)

Reason: Conceptual (True)

Ans: D

16. Assertion: S.I = $\frac{PTR}{100} = \frac{5000 \times 2 \times 10}{100} = \text{Rs } 1000$

$$A = 5000 \left(1 + \frac{10}{100}\right)^2$$

$$= 5000 \times \frac{11}{10} \times \frac{11}{10} = \text{Rs } 6050$$

$$C.I = 6050 - 5000 = \text{Rs } 1050 \text{ (True)}$$

Reason: Conceptual (True)

Ans: A

17. $C.P = 12,000 + 1000 = \text{Rs } 13,000$

Ans: C

18. $S.P = C.P \left(1 + \frac{P\%}{100}\right) = 13000 \left(1 + \frac{20}{100}\right) = \text{Rs } 15,600$

Ans: B

19. $a:b = 2:3$

$b:c = 4:5$

$a:b:c = 8:12:15$

$a:c = 8:15$

Ans: D



20 Let L_A = Last year salary of A (11)
 P_A = present year salary of A

Given $L_A = 3x$, $L_B = 4x$

$$P_A = \left(\frac{5}{4} \times 3x\right) = \frac{15}{4}x ; P_B = \frac{3}{2} \times 4x = 6x$$

$$P_A + P_B = \text{Rs } 4160$$

$$\frac{15x}{4} + 6x = 4160$$

$$\Rightarrow x = \frac{16640}{39}$$

$$\therefore P_A = \frac{15x}{4} = \frac{15 \times \frac{16640}{39}}{4}$$

$$= \text{Rs } 1600$$

Ans. B

21. M.P. = Rs 1200, Discount = 20%.

$$\text{Discount} = \frac{20}{100} \times 1200 = \text{Rs } 240.$$

$$\text{S.P.} = \text{M.P.} - \text{Discount} = 1200 - 240 = \text{Rs } 960.$$

$$\text{C.P.} = \text{Rs } 800$$

$$\text{Profit} = 960 - 800 = \text{Rs } 160.$$

Ans. 160

22 S.P. = Rs 550, P% = $\frac{1}{10} \times \text{C.P.}$

$$\text{S.P.} = \text{C.P.} + \frac{\text{C.P.}}{10}$$

$$550 = \text{C.P.} + \frac{\text{C.P.}}{10}$$

$$\Rightarrow \text{C.P.} = 500$$

$$\begin{aligned} \text{gain \%} &= \frac{\text{S.P.} - \text{C.P.}}{\text{C.P.}} \times 100 \\ &= \frac{550 - 500}{500} \times 100 \\ &= 10\% = 10n \end{aligned}$$

$$\Rightarrow n = 1$$

Ans. 1



23) a) profit = $500 - 400 = 100$.

(12)

profit = $\frac{100}{400} \times 100 = 25\%$ (P)

b) loss % = $\frac{800 - 720}{800} \times 100 = \frac{80}{800} \times 100 = \underline{10\%}$.

c) profit = $\frac{S.P - C.P}{C.P} \times 100$

$\Rightarrow 25 = \frac{S.P - 600}{600} \times 100 \Rightarrow \underline{SP = 750}$

d) profit % = $\frac{SP - C.P}{C.P} \times 100 = \frac{960 - 800}{800} \times 100$
 $= \frac{160}{800} \times 100$
 $= 20\%$ (Q)

Ans. —

24 a) $36 : 64 = 9 : 16$ (Q)

b) $40 : 300 = 2 : 15$ (B)

c) $24 : 60 = 2 : 5$ (P)

d) $125 : 2000 = 1 : 16$ (X)

Ans: a, c, p, r

$\Rightarrow$ THE END $\in$