2. OPERATIONS ON FRACTIONS

Class: VII. MATHEMATICS ①

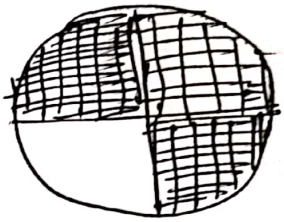
FOUNDATION: SOLUTIONS

2025/26

TEACHING TASK
JEE MAINS

01. $x + \frac{1}{3} = \frac{7}{12} \Rightarrow x = \frac{7}{12} - \frac{1}{3} \Rightarrow x = \frac{1}{4}$ Ans. A

02 $\frac{3}{4}$ cake shared by 5



Remaining $= \frac{1}{4}$

$\therefore \frac{1}{5}$ recieves the original cake by each friend

Ans. B

03 Anu eats $= \frac{7}{16}$

Teasa eats $= \frac{1}{4} \times \frac{4}{4} = \frac{4}{16}$

$\therefore$ Total cake 16 equal parts

$\therefore \frac{7}{16} + \frac{4}{16} + x = 16$ equal parts

$\Rightarrow x = \frac{7}{16}$

Ans: B

04 $\left(\frac{10}{5} * \frac{3}{6}\right) + \left(\frac{2}{3} \times \frac{6}{2}\right) - \frac{8}{4}$ of $\frac{14}{7}$

$= \frac{30}{30} + \left(\frac{12}{6}\right) - \frac{8}{4}$ of 2

$= (1 + 2 - 2)$ of $2 =$ 1 of $2 = 1 \times 2 = 2$

Ans.

05 $\left[\frac{5}{4} + \left(\frac{6}{10} \times \frac{5}{4}\right) - \left(\frac{3}{4} \times \frac{4}{6}\right) + \frac{1}{2}\right]$ of $\frac{3}{4}$ (2)

$= \left[\frac{5}{4} + \frac{30}{40} - \frac{1}{2} + \frac{1}{2}\right]$ of $\frac{3}{4}$

$= \frac{8}{4}$ of $\frac{3}{4}$ $= 2 \times \frac{3}{4} = \frac{3}{2}$ Ans. D

06 $12\frac{1}{2} + 12\frac{1}{3} + 12\frac{1}{6}$

$= \frac{25}{2} + \frac{37}{3} + \frac{73}{6}$

$= \frac{75 + 74 + 73}{6} = \frac{222}{6} = 37$ Ans. B

07 $\frac{2x}{1 + \frac{1}{1 + \frac{x}{1-x}}} = 1$

$\Rightarrow \frac{2x}{1 + \frac{1-x}{1}} = 1$

$\Rightarrow \frac{2x}{2-x} = 1$

$\Rightarrow 2x = 2 - x$

$\Rightarrow 3x = 2$

$\Rightarrow x = \frac{2}{3}$

Ans. C

08 $\frac{1}{3} + \frac{2}{5} - \frac{1}{4}$

$= \frac{20 + 24 - 15}{60} = \frac{29}{60}$ Ans: A

09 $\frac{2}{3} \div \left(\frac{4}{5} - \frac{1}{2}\right)$

$= \frac{2}{3} \div \left(\frac{3}{10}\right)$

$= \frac{2}{3} \times \frac{10}{3}$

$= \frac{20}{9}$ Ans: D

10 $3\frac{3}{5} = \frac{18}{5} = 3.6$

$2\frac{4}{7} = \frac{18}{7} = 2.5$

$\frac{19}{6} = 3.1$

$\frac{18}{8} = 2.2$

Greatest $= \frac{18}{5}$

least $= \frac{18}{8} = \frac{9}{4}$

Difference $= \frac{18}{5} - \frac{9}{4}$

$= \frac{27}{20}$ Ans. A

(3)

11 $\left(\frac{2}{5} + \frac{3}{5}\right) \div \left(\frac{7}{5} - \frac{4}{10}\right)$

$= \left(\frac{5}{5}\right) \div \left(\frac{14-4}{10}\right)$

$= 1 \div 1 = 1$

Ans: A

12 $3\frac{1}{4} + \frac{1}{2} \div \frac{3}{4} - \frac{1}{2} \times 3\frac{1}{2}$

$= \frac{13}{4} + \frac{1}{2} \div \frac{3}{4} - \frac{1}{2} \times \frac{7}{2}$

$= \frac{13}{4} + \frac{1}{2} \times \frac{4}{3} - \frac{7}{4}$

$= \frac{13}{4} + \frac{4}{6} - \frac{7}{4}$

$= \frac{39 + 8 - 21}{12}$

$= \frac{26}{12} = \frac{13}{6} = 2\frac{1}{6}$

Ans. A

13 Side of square $= a = 6\frac{2}{3} = \frac{20}{3}$

Area $= a^2 = \left(\frac{20}{3}\right)^2 = \frac{400}{9} = 45 \text{ mt}^2$ (approx)

Ans. B

14 $x \propto y = \frac{145}{7}$

$\Rightarrow x \times \frac{20}{3} = \frac{145}{7}$

$\Rightarrow x = \frac{145}{7} \times \frac{3}{20} = \frac{87}{28}$

Ans: D

15 $\frac{a}{b} \times \frac{b}{c} = \frac{3}{4} \times \frac{5}{6}$

$\Rightarrow \frac{a}{c} = \frac{5}{8}$

Ans: A

JEE ADVANCED

01. A) $\frac{3}{7} \times \frac{14}{6} = 1$ (True)

B) $\frac{2}{5} \times \frac{5}{2} = 1$ (True)

C) $\frac{4}{9} \times \frac{4}{9} = \frac{4}{9} \times \frac{4}{9}$ (True)

D) $\frac{3}{5} \times \frac{5}{2} = \frac{3}{2}$ (True)

Ans: A, B, C, D

02 $\left(\frac{3}{5} + \frac{2}{7}\right) \div \frac{1}{2}$

$= \frac{31}{35} \times 2 = \frac{62}{35}$

Ans: A, B, C

03 Statement I: $\frac{3}{7} \times \frac{14}{6} = 1$ (True)

Statement II: $\frac{3}{7} \times \frac{14}{6} = 1$ (True)

Ans: A

04 Statement I: $\frac{3}{4} \times \frac{8}{5} = \frac{6}{5}$ (True)

Statement II: Conceptual (True)

Ans: A

05 Assertion: $\frac{3}{4} - \frac{2}{5} = \frac{15-8}{20} = \frac{7}{20}$ (True) (5)

Reason: Conceptual (True)

Ans: A

06 Assertion: $1\frac{2}{3} = \frac{5}{3} \rightarrow$ Reciprocal $= \frac{3}{5}$ (True)

Reason: true

Ans: A

07 $\frac{7}{10} + \frac{9}{15} + \frac{11}{20}$

$= \frac{42+36+33}{60} = \frac{111}{60}$

Ans: —

08 Associative property

Ans: A

09. NOTE: Please Correct the question like follows, " A person spent $\frac{1}{4}$ of his salary on rent. From the remaining amount, he decided to denote $\frac{1}{3}^{rd}$.

10. Rent paid $= 1 - \frac{1}{4} = \frac{3}{4}$

donation $= \frac{1}{3}^{rd}$ of remaing amount

$= \frac{1}{3} \times \frac{3}{4} = \frac{1}{4}$.

Amount left after donation

$= \frac{3}{4} - \frac{1}{4} = \frac{1}{2}$

11. $\left(\frac{5}{6}+\frac{1}{3}\right) \times \frac{2}{1} = \left(\frac{5+2}{6}\right) \times \frac{2}{1} = \frac{7}{3} = \frac{N}{5}$

$\Rightarrow N = 7$

Ans: 7

12 $5 \times \frac{2}{3} = \frac{10}{3} = 3\frac{1}{3}$ → 3 Complete units

Ans. 3

13 a) $9\frac{3}{4} + 7\frac{7}{6} + 3\frac{5}{12}$

$= \frac{39}{4} + \frac{49}{6} + \frac{41}{12}$

$= \frac{117 + 98 + 41}{12}$

$= \frac{256}{12} = 21\frac{1}{3}$

b) $3\frac{1}{4} - 1\frac{5}{6} + 2\frac{3}{8}$

$= \frac{13}{4} - \frac{11}{6} + \frac{19}{8}$

$= \frac{78 - 44 + 57}{24}$

$= \frac{91}{24} = 3\frac{19}{24}$

c) $9\frac{5}{14} - 6\frac{8}{21} + \frac{25}{42}$

$= \frac{131}{14} - \frac{134}{21} + \frac{25}{42}$

$= \frac{393 - 268 + 25}{42}$

$= \frac{150}{42}$

$= 3\frac{4}{7}$

d) $2\frac{1}{8} - \frac{7}{12} - \frac{23}{24}$

$= \frac{17}{8} - \frac{7}{12} - \frac{23}{24}$

$= \frac{51 - 14 - 23}{24} = \frac{14}{24} = \frac{7}{12}$

Ans. Q, P, R, S

14 a) Distance = S × T = $\frac{2}{3} \times 6 = 4$ km

b) $\frac{5}{6}$ tank → 1 hr

1 tank → $\frac{6}{5}$ hr

c) No. of pieces = $\frac{7}{8} \div \frac{1}{16} = \frac{7}{8} \times 16 = 14$

d) $6 \times \frac{4}{3} = 8$

Ans: 8, S, P, Q

LEARNER'S TASK (CUQ'S)

01. $\frac{2}{3}+\frac{1}{4}=\frac{8+3}{12}=\frac{11}{12}$ Ans. B

02 $\frac{3}{5}-\frac{1}{5}=x \Rightarrow x=\frac{2}{5}$ Ans. A

03 $\frac{2}{3}\times\frac{5}{4}=\frac{5}{6}$ Ans. A

04 $\frac{15}{7}\times\frac{28}{45}=\frac{4}{3}$ Ans. B

05 $\frac{80}{9}\div\frac{16}{7}=\frac{x}{9}$

$\Rightarrow \frac{80}{9}\times\frac{7}{16}=\frac{x}{9} \Rightarrow x=35$ Ans. A

06 $\frac{9}{8}-x=\frac{39}{56} \Rightarrow x=\frac{9}{8}-\frac{39}{56}=\frac{63-39}{56}=\frac{24}{56}=\frac{3}{7}$ Ans: C

07 1 hour $\rightarrow \frac{30}{4}$ km

4 hours $\rightarrow \frac{30}{4}\times 4 = 30$ km Ans. C

08 $\frac{2}{3}+x=1 \Rightarrow x=1-\frac{2}{3}=\frac{1}{3}$ Ans: A

09. $\frac{x}{y}\times\frac{z}{y}\times\frac{y}{z}\times\frac{y}{z}=\frac{x}{z}$ Ans. C

10 Reciprocal of $\frac{3}{5}$ is $\frac{5}{3}$ Ans: C

11. $\frac{16}{5}\div\frac{2}{1}$

$=\frac{16}{5}\times\frac{1}{2}=\frac{8}{5}=1\frac{3}{5}$ Ans. D

12. Remaining drink $= 1 - \frac{3}{8} = \frac{5}{8}$ lit.

In 24 days $= \frac{3}{8} \times 24 = 9$ lit

Ans. B

13 $\frac{1}{2} + \frac{1}{x} = 2 \Rightarrow \frac{1}{x} = 2 - \frac{1}{2} = \frac{3}{2}$

$\therefore x = \frac{2}{3}$

Ans: A

14 $\frac{4}{7} \div \frac{2}{3} = y$

$\Rightarrow \frac{4}{7} \times \frac{3}{2} = y$

$y = \frac{6}{7}$

Ans: A

JEE MAINS LEVEL

01 $\frac{a}{b} \times \frac{b}{c} = \frac{2}{3} \times \frac{3}{4} = \frac{1}{2}$

$\therefore \frac{a}{c} = \frac{1}{2}$

Ans: A

02 $\frac{p+q}{p-q} = \frac{\left(\frac{p}{q}\right)+1}{\left(\frac{p}{q}\right)-1} = \frac{\frac{1}{2}+1}{\frac{1}{2}-1} = \frac{\left(\frac{3}{2}\right)}{\left(\frac{-1}{2}\right)} = -3$

Ans: —

03 $\frac{2}{3} + \frac{1}{5} + x = 1$

$\Rightarrow \frac{13}{15} + x = 1$

$x = 1 - \frac{13}{15} = \frac{2}{15}$

Ans: C

04 $\frac{1}{7} + \frac{2}{7} + x = 1$

$\Rightarrow \frac{3}{7} + x = 1$

$\Rightarrow x = 1 - \frac{3}{7} = \frac{4}{7}$

Ans: D

05 $\frac{1}{8} + \frac{3}{4} = \frac{1+6}{8} = \frac{7}{8}$

Ans: A

06 c) $\frac{5}{8} + \frac{3}{4}$

$= \frac{5+6}{8} = \frac{11}{8} = 1\frac{3}{8}$

Ans. C

07 $\frac{4}{10} + \frac{5}{100} + \frac{7}{1000}$

$= \frac{400+50+7}{1000} = \frac{457}{1000}$

Ans. C

08 $4\frac{1}{5} - \left[3\frac{1}{3} - \left\{2\frac{1}{2} - \left(\frac{1}{3} + \frac{1}{6} - \frac{1}{12}\right)\right\}\right]$

$= \frac{21}{5} - \left[\frac{10}{3} - \left\{\frac{5}{2} - \left(\frac{4+2-1}{12}\right)\right\}\right]$

$= \frac{21}{5} - \left[\frac{10}{3} - \left\{\frac{5}{2} - \frac{5}{12}\right\}\right]$

$= \frac{21}{5} - \left[\frac{10}{3} - \frac{25}{12}\right]$

$= \frac{21}{5} - \frac{15}{12}$

$= \frac{177}{60} = \frac{59}{20}$

Ans. A

09 $5\frac{1}{6} - 3\frac{4}{9} + x = \frac{7}{3} \times 4\frac{1}{6}$

$\Rightarrow \frac{31}{6} - \frac{31}{9} + x = \frac{7}{3} \times \frac{25}{6}$

$\Rightarrow x = \frac{175}{18} - \frac{31}{6} + \frac{31}{9}$

$= \frac{175 - 93 + 62}{18} = \frac{144}{18} = 8$

Ans. A

10 Manish Unread $= 1 - \frac{5}{6} = \frac{1}{6}$ Ans. B

(10)

11 $A = 41\frac{2}{3} \times 18\frac{3}{5}$

$= \frac{125}{3} \times \frac{93}{5}$

$= 775 \text{ mt}^2$

Ans. D

12 Cost per 1 kg $= \frac{101\frac{1}{4}}{5\frac{2}{5}} = \frac{405}{4} \times \frac{5}{27}$

$= \frac{75}{4} = 18\frac{3}{4}$

Ans. A

JEE ADVANCED LEVEL

01. Options: A, B, C are conceptually true

Ans. A, B, C

02 A) $\frac{5}{7} - \frac{9}{7} = \frac{-4}{7} < 0$

B) $\frac{-3+2}{4} = \frac{-1}{4} < 0$

C) $\frac{-1}{3} \times \frac{2}{1} = \frac{-2}{3} < 0$

d) $\frac{1}{4} \times \frac{1}{3} = \frac{1}{12} > 0$

Ans. A, B, C

03 Statement I: $\frac{4}{5} - \frac{2}{3}$

$= \frac{12-10}{15} = \frac{2}{15}$ (true)

Statement II: Conceptual (true)

Ans. A

04. Statement I: $\frac{a}{b} = \frac{5}{8} \Rightarrow \frac{b}{a} = \frac{8}{5}$ (false)

Statement II: Conceptual (true)

Ans. D

05 Assertion: $\frac{3}{5} \div \frac{5}{6} = \frac{3}{5} \times \frac{6}{5} = \frac{18}{25}$ (True)

Reason: True

Ans. A

06 Assertion: The reciprocal of 1 is 1 (False)

Reason: Conceptual (True)

Ans. D

07 Ratio: $\frac{3}{5} : \frac{2}{5} = 3:2$

First person gets $= \frac{3}{5} \times \frac{7}{8} = \frac{21}{40}$

Ans. D

08 Multiplication

Ans: C

09. Let the daily wage be Rs. x

For 7 days, he was paid $\frac{3}{4}$ of daily wage

$\therefore 7 \times \frac{3}{4} x = \text{Rs } \frac{21}{4}$.

For 1 day, he has paid $\frac{1}{2}$ of daily wage

i.e $\frac{x}{2}$

Total wage recieved $= \frac{21}{4} x + \frac{x}{2}$

$= \frac{23x}{4}$

Ans:

10. Multiplication and division

Ans. A

11. $\frac{5}{8} + \frac{3}{4} + \frac{7}{8}$

$= \frac{5+6+7}{8} = \frac{18}{8}$

$= \frac{N}{8} \Rightarrow N = 18$

Ans: D

12 $\left(\frac{2}{5} \times \frac{10}{9}\right) \times \frac{3}{2} = \frac{2}{3} \times \frac{3}{2} = 1$ Ans: 1

(12)

13 a) $7\frac{1}{4} \times 3\frac{5}{6} = \frac{29}{4} \times \frac{23}{6} = \frac{667}{24}$

b) $\left(3\frac{3}{5}\right) \div \frac{9}{8} = \frac{18}{5} \times \frac{8}{9} = \frac{16}{5}$

c) $\frac{135}{60} \times \frac{190}{11} = \frac{855}{22}$

d) $\frac{1}{5} \div \frac{1}{2} = \frac{1}{5} \times \frac{2}{1} = \frac{2}{5}$

Ans: S, R, Q, P

14 a) $\frac{5}{6}$ kg $= \frac{5}{6} \times 1$ kg $= \frac{5}{6} \times 1000$ gms

$= 833$ gms (approx)

b) $4 \times \frac{3}{4} = 3$ lit

c) $\frac{6}{8} \times 2 = \frac{3}{2} = 1.5$ lit

d) $\frac{\left(\frac{5}{6}\right)}{2} = \frac{5}{12}$

Ans: S, R, Q, P

$\Rightarrow$ THE END $\in$