EXERCISE 14(B)

Question 1.

Reduce the given fractions to their lowest terms :

(i) $\frac{8}{10}$ (ii) $\frac{50}{75}$

(iii) $\frac{18}{81}$ (iv) $\frac{40}{120}$

(v) $\frac{105}{70}$

Solution:

(i) $\frac{8}{10} = \frac{8 \div 2}{10 \div 2} = \frac{4}{5}$

(ii) $\frac{50}{75} = \frac{50 \div 25}{75 \div 25} = \frac{2}{3}$

(iii) $\frac{18}{81} = \frac{18 \div 9}{81 \div 9} = \frac{2}{9}$

(iv) $\frac{40}{120} = \frac{40 \div 40}{120 \div 40} = \frac{1}{3}$

(v) $\frac{105}{70} = \frac{105 \div 35}{70 \div 35} = \frac{3}{2}$

Question 2.

State, whether true or false ?

(*i*) $\frac{2}{5} = \frac{10}{15}$ (*ii*) $\frac{35}{42} = \frac{5}{6}$

(*iii*) $\frac{5}{4} = \frac{4}{5}$ (*iv*) $\frac{7}{9} = 1\frac{1}{7}$

(*v*) $\frac{9}{7} = 1\frac{1}{7}$

Solution:

(*i*) $\frac{2}{5} = \frac{10}{15} = \frac{10 \div 5}{15 \div 5} = \frac{2}{3}$

$\therefore \frac{2}{5} \neq \frac{2}{3}$, **False**

(*ii*) $\frac{35}{42} = \frac{5}{6}$

$\frac{35}{42} = \frac{35 \div 7}{42 \div 7} = \frac{5}{6}$

$\therefore \frac{5}{6} = \frac{5}{6}$, **True**

(*iii*) $\frac{5}{4} = \frac{4}{5}$, **False**

(*iv*) $\frac{7}{9} = 1\frac{1}{7}$

Now, $\frac{7}{9}$; $1\frac{1}{7} = \frac{7 \times 1 + 1}{7} = \frac{8}{7}$

$\frac{7}{9} \neq \frac{8}{7}$, **False**

(*v*) $\frac{9}{7} = 1\frac{1}{7}$

Now, $\frac{9}{7}$; $1\frac{1}{7} = \frac{7 \times 1 + 1}{7} = \frac{8}{7}$

$\frac{9}{7} \neq \frac{8}{7}$, **False.**

Question 3.

Which fraction is greater ?

(*i*) $\frac{3}{5}$ or $\frac{2}{3}$ (*ii*) $\frac{5}{9}$ or $\frac{3}{4}$

(*iii*) $\frac{11}{14}$ or $\frac{26}{35}$

Solution:

(*i*) $\frac{3}{5}$ or $\frac{2}{3}$

L.C.M. of 5, 3 = 15

Now, $\frac{3}{5} = \frac{3 \times 3}{5 \times 3} = \frac{9}{15}$;

$\frac{2}{3} = \frac{2 \times 5}{3 \times 5} = \frac{10}{15}$

$\frac{10}{15} > \frac{9}{15}$ $\therefore \frac{2}{3} > \frac{3}{5}$ [as its numerator is greater]

(*ii*) $\frac{5}{9}$ or $\frac{3}{4}$

Converting in like fraction,

$\frac{5 \times 4}{9 \times 4} = \frac{20}{36}$; $\frac{3}{4} = \frac{3 \times 9}{4 \times 9} = \frac{27}{36}$

$\frac{3}{4} > \frac{5}{9}$ [as its numerator is greater]

(*iii*) $\frac{11}{14}$ or $\frac{26}{35}$

Converting in like fraction,

$\frac{11}{14} = \frac{11 \times 5}{14 \times 5} = \frac{55}{70}$; $\frac{26}{35} = \frac{26 \times 2}{35 \times 2} = \frac{52}{70}$

$\frac{11}{14} > \frac{26}{35}$ [as its numerator is greater]

Question 4.

Which fraction is smaller?

(*i*) $\frac{3}{8}$ or $\frac{4}{5}$ (*ii*) $\frac{8}{15}$ or $\frac{4}{7}$

(*iii*) $\frac{7}{26}$ or $\frac{10}{39}$

Solution:

(*i*) $\frac{3}{8}$ or $\frac{4}{5}$

Converting in like fraction

$\frac{3}{8} = \frac{3 \times 5}{8 \times 5} = \frac{15}{40}$; $\frac{4}{5} = \frac{4 \times 8}{5 \times 8} = \frac{32}{40}$

$\frac{3}{8} < \frac{4}{5}$ [as its numerator is smaller]

(*ii*) $\frac{8}{15}$ or $\frac{4}{7}$

Converting into like fraction

$\frac{8}{15} = \frac{8 \times 7}{15 \times 7} = \frac{56}{105}$; $\frac{4}{7} = \frac{4 \times 15}{7 \times 15} = \frac{60}{105}$

$\frac{8}{15} < \frac{4}{7}$ [as its numerator is smaller]

(*iii*) $\frac{7}{26}$ or $\frac{10}{39}$

Converting the like fraction

$\frac{7}{26} = \frac{7 \times 3}{26 \times 3} = \frac{21}{78}$; $\frac{10}{39} = \frac{10 \times 2}{39 \times 2} = \frac{20}{78}$

$\frac{10}{39} < \frac{7}{26}$ [as its numerator is smaller]

Question 5.

Arrange the given fractions in descending order of magnitude :

(*i*) $\frac{5}{16}, \frac{13}{24}, \frac{7}{8}$ (*ii*) $\frac{4}{5}, \frac{7}{15}, \frac{11}{20}, \frac{3}{4}$

(*iii*) $\frac{5}{7}, \frac{3}{8}, \frac{9}{11}$

Solution:

(*i*) $\frac{5}{16}, \frac{13}{24}, \frac{7}{8}$

2	16,24,8
2	8,12,4
2	4,6,2
2	2,3,1
3	1,3,1
	1,1,1

∴L.C.M. of 16, 24, 8 = 2 × 2 × 2 × 2 × 3 = 48

L.C.M. of denominator 16, 24, 8 = 48

Converting into like fractions

$$\frac{5}{16}=\frac{5\times 3}{16\times 3}=\frac{15}{48};\ \frac{13}{24}=\frac{13\times 2}{24\times 2}=\frac{26}{48};$$

$$\frac{7}{8}=\frac{7\times 6}{8\times 6}=\frac{42}{48}$$

Now, arranging in descending order

$$\frac{7}{8},\frac{13}{24},\frac{5}{16}$$

(*ii*) $\frac{4}{5},\frac{7}{15},\frac{11}{20},\frac{3}{4}$

L.C.M. of denominator 5, 15, 20, 4 = 60

Converting into like fractions,

$$\frac{4}{5}=\frac{4\times 12}{5\times 12}=\frac{48}{60};\ \frac{7}{15}=\frac{7\times 4}{15\times 4}=\frac{28}{60};$$

$$\frac{11}{20}=\frac{11\times 3}{20\times 3}=\frac{33}{60};\ \frac{3}{4}=\frac{3\times 15}{4\times 15}=\frac{45}{60}$$

Now, arranging in descending order,

$$\frac{4}{5},\frac{3}{4},\frac{11}{20},\frac{7}{15}$$

(*iii*) $\frac{5}{7},\frac{3}{8},\frac{9}{11}$

L.C.M. of numerator 5, 3, 9 = 45

3	5, 3, 9
5	5, 1, 3
3	1, 1, 3
	1, 1, 1

$= 3 \times 5 \times 3 = 45$

$$\therefore \frac{5}{7}=\frac{5\times 9}{7\times 9}=\frac{45}{63};\ \frac{3}{8}=\frac{3\times 15}{8\times 15}=\frac{45}{120}$$

$$\frac{9}{11}=\frac{9\times 5}{11\times 5}=\frac{45}{55}$$

We know that the numerator being same, the fraction having the smallest denominator is the biggest fraction.

$$\therefore \frac{45}{55},\frac{45}{63},\frac{45}{120}$$

i.e. $\frac{9}{11},\frac{5}{7},\frac{3}{8}$

Question 6.

Arrange the given fractions in ascending order of magnitude :

(*i*) $\frac{9}{16}, \frac{7}{12}, \frac{1}{4}$ (*ii*) $\frac{5}{6}, \frac{2}{7}, \frac{8}{9}, \frac{1}{3}$

(*iii*) $\frac{2}{3}, \frac{5}{9}, \frac{5}{6}, \frac{3}{8}$

Solution:

(*i*) $\frac{9}{16}, \frac{7}{12}, \frac{1}{4}$

L.C.M. of the denominator 16, 12, 4

= 48

4	16, 12, 4
4	4, 3, 1
3	1, 3, 1
	1, 1, 1

$= 4 \times 4 \times 3 = 48$

$\therefore \frac{9}{16} = \frac{9 \times 3}{16 \times 3} = \frac{27}{48}$; $\frac{7}{12} = \frac{7 \times 4}{12 \times 4} = \frac{28}{48}$

$\frac{1}{4} = \frac{1 \times 12}{4 \times 12} = \frac{12}{48}$

Arranging in ascending order,

$\frac{12}{48}, \frac{27}{48}, \frac{28}{48}$

i.e. $\frac{1}{4}, \frac{9}{16}, \frac{7}{12}$

(ii) $\frac{5}{6}, \frac{2}{7}, \frac{8}{9}, \frac{1}{3}$

L.C.M. of the denominator 6, 7, 9, 3
= 126

3	6, 7, 9, 3
	2, 7, 3, 1

$= 3 \times 2 \times 7 \times 3 = 126$

$\therefore \frac{5}{6} = \frac{5 \times 21}{6 \times 21} = \frac{105}{126}$; $\frac{2}{7} = \frac{2 \times 18}{7 \times 18} = \frac{36}{126}$

$\frac{8}{9} = \frac{8 \times 14}{9 \times 14} = \frac{112}{126}$;

$\frac{1}{3} = \frac{1 \times 42}{3 \times 42} = \frac{42}{126}$

Arranging in ascending order,

$\frac{36}{126}, \frac{42}{126}, \frac{105}{126}, \frac{112}{126}$

i.e. $\frac{2}{7}, \frac{1}{3}, \frac{5}{6}, \frac{8}{9}$

(iii) $\frac{2}{3}, \frac{5}{9}, \frac{5}{6}, \frac{3}{8}$

L.C.M. of the denominator 3, 9, 6, 8
= 72

2	3, 9, 6, 8
3	3, 9, 3, 4
	1, 3, 1, 4

$= 2 \times 3 \times 3 \times 4 = 72$

$\therefore \frac{2}{3} = \frac{2 \times 24}{3 \times 24} = \frac{48}{72}$; $\frac{5}{9} = \frac{5 \times 8}{9 \times 8} = \frac{40}{72}$

$\frac{5}{6} = \frac{5 \times 12}{6 \times 12} = \frac{60}{72}$; $\frac{3}{8} = \frac{3 \times 9}{8 \times 9} = \frac{27}{72}$

Arranging in ascending order,

$\frac{27}{72}, \frac{40}{72}, \frac{48}{72}, \frac{60}{72}$

i.e. $\frac{3}{8}, \frac{5}{9}, \frac{2}{3}, \frac{5}{6}$

Question 7.

I bought one dozen bananas and ate five of them. What fraction of the total number of bananas was left ?

Solution:

Number of bananas bought = 1

Dozen = 12
Number of bananas eaten by me = 5
Number of bananas left = 12 – 5 = 7
Fraction = $\frac{7}{12}$

Question 8.
Insert the symbol '=' or '>' or '<' between each of the pairs of fractions, given below :

(*i*) $\frac{6}{11} \cdots \frac{5}{9}$ **(*ii*)** $\frac{3}{7} \cdots \frac{9}{13}$

(*iii*) $\frac{56}{64} \cdots \frac{7}{8}$ **(*iv*)** $\frac{5}{12} \cdots \frac{8}{33}$

Solution:

(*i*) $\frac{6}{11}, \frac{5}{9}$

L.C.M. of 11, 9 = 99

$\therefore \frac{6}{11} = \frac{6\times9}{11\times9} = \frac{54}{99}$

and $\frac{5}{9} = \frac{5\times11}{9\times11} = \frac{55}{99}$

It is clear that $\frac{54}{99} < \frac{55}{99}$

$\Rightarrow \frac{6}{11} < \frac{5}{9}$

(*ii*) $\frac{3}{7}, \frac{9}{13}$

L.C.M. of 7, 13 = 91

$\therefore \frac{3}{7} = \frac{3\times13}{7\times13} = \frac{39}{91}$

and $\frac{9}{13} = \frac{9\times7}{13\times7} = \frac{63}{91}$

It is clear that $\frac{39}{91} < \frac{63}{91}$

$\Rightarrow \frac{3}{7} < \frac{9}{13}$

(iii) $\frac{56}{64}, \frac{7}{8}$

L.C.M. of 64, 8 = 64

$\therefore \frac{56\times1}{64\times1} = \frac{56}{64}$

$\frac{7}{8} = \frac{7\times8}{8\times8} = \frac{56}{64}$

It is clear that

$\frac{56}{64} = \frac{56}{64} \Rightarrow \frac{56}{64} = \frac{7}{8}$

(iv) $\frac{5}{12}, \frac{8}{33}$

L.C.M. of 12, 33 = 132

$\frac{5}{12} = \frac{5\times11}{12\times11} = \frac{55}{132}$

and $\frac{8}{33} = \frac{8\times4}{33\times4} = \frac{32}{132}$

It is clear that

$\frac{55}{132} > \frac{32}{132} \Rightarrow \frac{5}{12} > \frac{8}{33}$

Question 9.

Out of 50 identical articles, 36 are broken. Find the fraction of :

(i) The total number of articles and the articles broken.

(ii) The remaining articles and total number of articles.

Solution:

Total number of articles = 50

Number of articles broken = 36

Remaining articles = 50 – 36 = 14

Now (i) the fraction of the total number of articles and articles broken = $\frac{50}{36}$

$= \frac{50\div2}{36\div2} = \frac{25}{18}$

(ii) The fraction between the remaining articles and total number of articles

$= \frac{14}{50} = \frac{14\div2}{50\div2} = \frac{7}{25}$