

⑦ Speed of boat in still water = 5 km/h  
let speed of stream = x km/h

upstream	downstream
$s = (5-x) \text{ km/h}$	$s = (5+x) \text{ km/h}$
$d = 40 \text{ km}$	$d = 40 \text{ km}$
$t = \frac{d}{s} = \frac{40}{5-x} \text{ h}$	$t = \frac{d}{s} = \frac{40}{5+x}$

acc to prob.

$$\frac{40}{5-x} = 3 \times \frac{40}{5+x}$$

$$\Rightarrow 5+x = 15-3x$$

$$\Rightarrow 4x = 10$$

$$\Rightarrow x = 2.5$$

Speed of stream = 2.5 km/h

⑧ let speed of boat in still water = x km/h  
speed of stream = y km/h

con I

upstream	downstream
$s = (x-y) \text{ km/h}$	$s = (x+y) \text{ km/h}$
$d = 30 \text{ km}$	$d = 28 \text{ km}$
$t = \frac{d}{s} = \frac{30}{x-y} \text{ h}$	$t = \frac{d}{s} = \frac{28}{x+y}$

$$\frac{30}{x-y} + \frac{28}{x+y} = 7 \dots \textcircled{1}$$

con II

upstream	downstream
$s = (x-y) \text{ km/h}$	$s = (x+y) \text{ km/h}$
$d = 21 \text{ km}$	$d = 21 \text{ km}$
$t = \frac{d}{s} = \frac{21}{x-y} \text{ h}$	$t = \frac{d}{s} = \frac{21}{x+y} \text{ h}$

$$\frac{21}{x-y} + \frac{21}{x+y} = 5 \dots \textcircled{11}$$

$$\textcircled{1} \times 3 - \textcircled{11} \times 4$$

$$\frac{90}{x-y} + \frac{84}{x+y} = 21$$

$$\frac{84}{x-y} + \frac{84}{x+y} = 20$$

$$\frac{6}{x-y} = 1$$

$$\Rightarrow x-y = 6 \dots \textcircled{111}$$

Sub ①

$$5 \frac{30}{6} + \frac{28}{x+y} = 7$$

$$\Rightarrow \frac{28}{x+y} = 2$$

$$\Rightarrow x+y = 14 \dots \textcircled{112}$$

$$\textcircled{111} + \textcircled{112}$$

$$x-y = 6$$

$$x+y = 14$$

$$2x = 20$$

$$\Rightarrow x = 10$$

Sub ①11

$$10-y = 6$$

$$\Rightarrow y = 4$$

$\therefore$  Sp. boat in still water = 10 km/h  
speed stream = 4 km/h