Time and Work Questions for SSC CHSL and MTS

Questions

Instructions
For the following questions answer them individually

Question 1

A train can travel 40% faster then a car.Both the train and the car start from point A at the same time and reach point B, which is 70km away point from A,at the same time.On the way, however,the train lost about 15 minutes while stopping at stations. The speed of the car in km/h is:

A 120

B 80

C 90

D 100

Answer: B

Explanation:
let the speed of car be x.

then the speed of train = $x\left(1+\frac{40}{100}\right)=1.4x$

Time taken by car to cover 70km = $\frac{70}{x}$

Time taken by train to cover 70km = $\frac{70}{1.4x}=\frac{50}{x}$

According to question,

$\therefore \frac{70}{x}-\frac{50}{x}=\frac{15}{60}$

$\therefore \frac{20}{x}=\frac{1}{4}$

so, Speed of car = x = 80 km/hr

Hence, Option B is correct

Question 2

A man and a woman, working together can do a work in 66 days. The ratio of their working efficiencies is 3 : 2. In how many days 6 men and 2 women working together can do the same work?

A 18

B 15

C 14

D 12

Answer: B

Explanation:
Let the total work be 330 units.

Efficiency of a man and a woman together = $\frac{330}{66}$ = 5 units/day

The ratio of the working efficiencies of man and woman is 3 : 2.

Efficiency of a man = 3 units/day

Efficiency of a woman = 2 units/day

Efficiency of 6 men and 2 women together = (6 x 3) + (2 x 2) = 22 units/day

Time required for 6 men and 2 women together to complete the work = $\frac{330}{22}$ = 15 days

Hence, the correct answer is Option B

Question 3

A train running at $40\frac{1}{2}$ km/h takes 24 seconds to cross a pole. How much time (in seconds) will it take to pass a 450 m long bridge?

A 56

B 52

C 60

D 64

Answer: D

Explanation:
Let the length of the train = L

Speed of the train = $40\frac{1}{2}$ km/h = $\frac{81}{2}$ km/h = $\frac{81}{2} \times \frac{5}{18}$ m/sec = $\frac{45}{4}$ m/sec

Train crosses a pole in 24 seconds.

$\frac{L}{\frac{45}{4}}$ = 24

$\frac{4L}{45}$ = 24

L = 270 m

Length of the train = L = 270 m

Time required for train to pass a 450 m long bridge = $\frac{L+450}{\frac{45}{4}}$

= $\frac{270+450}{\frac{45}{4}}$

= $\frac{720\times4}{45}$

= 64 sec

Hence, the correct answer is Option D

SSC CHSL Free Mock Test

Question 4

A and B can do certain work in 18 days and 30 days,respectively. They work together for 5 days. C alone completes the remaining work in 15 days. A and C together can complete $\frac{5}{6}$ th part of the same work in:

A 6 days

B 8 days

C 9 days

D 5 days

Answer: C

Explanation:
Let the total work = 360 units

Efficiency of A = $\frac{360}{18}$ = 20 units/day

Efficiency of B = $\frac{360}{30}$ = 12 units/day

A and B worked together for 5 days.

Work done by A and B together in 5 days = 5 x (20 + 12) = 160 units

Remaining work = 360 - 160 = 200 units

C alone completes the remaining work in 15 days.

Efficiency of C = $\frac{200}{15}$ = $\frac{40}{3}$ units/day

Efficiency of A and C together = 20 + $\frac{40}{3}$ = $\frac{100}{3}$ units/day

$\frac{5}{6}$th of the total work = $\frac{5}{6} \times 360$ = 300 units

Number of days required for A and C together to complete $\frac{5}{6}$th of work = $\frac{300}{\frac{100}{3}}$

= $\frac{300 \times 3}{100}$

= 9 days

Hence, the correct answer is Option C

Question 5

A can complete a work in $11\frac{1}{2}$ days. B is 25% more efficient than A and C is 50% less efficient than B. Working together A, B and C will complete the same work

A 5 days

B 4 days

C 3 days

D 8 days

Answer: B

Explanation:
Let the total work = 460 units

A can complete a work in $11\frac{1}{2}$ days.

Efficiency of A = $\frac{460}{\frac{23}{2}}$ = 40 units/day

B is 25% more efficient than A.

Efficiency of B = $\frac{125}{100} \times 40$ = 50 units/day

C is 50% less efficient than B.

Efficiency of C = $\frac{50}{100} \times 50$ = 25 units/day

Efficiency of A, B and C together = 40 + 50 + 25 = 115 units/day

Number of days required for A, B and C together to complete the work = $\frac{460}{115}$ = 4 days

Hence, the correct answer is Option B

Question 6

A train covers 450 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less to cover the same distance. How much time will it take to cover 315 km at its usual speed?

A 7h 52m

B 6h 30m

C 6h 18m

D 7h

Answer: D

Explanation:
Let the uniform speed of train = s

According to the problem,

$\frac{450}{s+5} = \frac{450}{s} - 1$

$\frac{450}{s} - \frac{450}{s+5} = 1$

$450\left(\frac{s+5-s}{s(s+5)}\right) = 1$

$450\left(\frac{5}{s^2+5s}\right) = 1$

$s^2 + 5s - 2250 = 0$

$(s+50)(s-45) = 0$

s = -50 or s = 45

s cannot be negative, so s = 45 km/h

The uniform speed of train = 45 km/h

Time taken by train to cover 315 km at its usual speed = $\frac{315}{45}$ = 7 hours

Hence, the correct answer is Option D

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Question 7

A car can cover a distance of 144 km in 1.8 hours. In what time(in hours) will it cover double the distance when its speed is increased by 20% ?

A 3

B 2.5

C 2

D 3.2

Answer: A

Explanation:
Speed of the car = $\frac{144}{1.8}$ = 80 km/hr

Speed of the car when increased by 20% = $\frac{120}{100} \times 80$ = 96 km/hr

Required time = $\frac{288}{96}$

= 3 hours

Hence, the correct answer is Option A

Question 8

A boat goes 30 km upstream in 3 hours and downstream in 1 hour. How much time (in hours) will this boat take to cover 60 km in still water?

A 6

B 3

C 2

D 5

Answer: B

Explanation:
Let the speed of the boat in still water = m

Speed of the stream = s

Upstream speed = m - s

$\frac{30}{3}$ = m - s

m - s = 10............(1)

Downstream speed = m + s

$\frac{30}{1}$ = m + s

m + s = 30...........(2)

Adding (1) and (2),

2m = 40

m = 20

Speed of the boat in still water = 20 km/h

Time required for the boat to cover 60 km in still water = $\frac{60}{20}$ = 3 hours

Hence, the correct answer is Option B

Question 9

A is twice as good a workman as B and together they finish a piece of work in 22 days. In how many days will A alone finish the same work?

A 30 days

B 44 days

C 33 days

D 11 days

Answer: C

Explanation:
Let the total work = W

A is twice as good a workman as B

Let the number of days required for A alone to complete the work = a

$\Rightarrow$ Number of days required for B alone to complete the work = 2a

Work done by A in 1 day = $\frac{W}{a}$

Work done by B in 1 day = $\frac{W}{2a}$

Given, A and B together finish the work in 22 days

$\Rightarrow$ Work done by A and B together in 1 day = $\frac{W}{22}$

$\Rightarrow \frac{W}{a} + \frac{W}{2a} = \frac{W}{22}$

$\Rightarrow \frac{3}{2a} = \frac{1}{22}$

$\Rightarrow$ a = 33

$\therefore$ Number of days required for A alone to complete the work = 33 days

Hence, the correct answer is Option C

Question 10

A and B together can complete a piece of work in 15 days. B and C together can do it in 24 days. If A is twice as good a workman as C, then in how many days can B alone complete the work?

A 60 days

B 40 days

C 52 days

D 45 days

Answer: A

Explanation:
Let the total work = W

Given, A is twice as good a workman as C

Let the number of days required for A alone to complete the work = a

$\Rightarrow$ Number of days required for C alone to complete the work = 2a

Let the number of days required for B alone to complete the work = b

Work done by B in 1 day = $\frac{W}{b}$

Work done by A in 1 day = $\frac{W}{a}$

Work done by C in 1 day = $\frac{W}{2a}$

A and B together can complete a piece of work in 15 days

$\Rightarrow$ Work done by A and B together in 1 day = $\frac{W}{15}$

$\Rightarrow \frac{W}{a} + \frac{W}{b} = \frac{W}{15}$

$\Rightarrow \frac{1}{a} = \frac{1}{15} - \frac{1}{b}$ ....(1)

B and C together can complete the work in 24 days

$\Rightarrow$ Work done by B and C together in 1 day = $\frac{W}{24}$

$\Rightarrow \frac{W}{b} + \frac{W}{2a} = \frac{W}{24}$

$\Rightarrow \frac{1}{b} + \frac{1}{2a} = \frac{1}{24}$

$\Rightarrow \frac{1}{b} + \frac{1}{2}\left[\frac{1}{15} - \frac{1}{b}\right] = \frac{1}{24}$ [From (1)]

$\Rightarrow \frac{1}{2b} = \frac{1}{24} - \frac{1}{30}$

$\Rightarrow \frac{1}{2b} = \frac{5-4}{120}$

$\Rightarrow \frac{1}{b} = \frac{1}{60}$

$\Rightarrow$ b = 60

$\therefore$ Number of days required for B alone to complete the work = 60 days

Hence, the correct answer is Option A

Question 11

Rahul and Mithun travel a distance of 30 km. The sum of their speeds is 70 km/h and the total time taken by both to travel the distance is 2 hours 6 minutes. The difference between their speeds is:

A 35 km/h

B 20 km/h

C 25 km/h

D 30 km/h

Answer: D

Explanation:
Let the speed of Rahul = s

$\Rightarrow$ Speed of Mithun = 70 - s

Time taken by Rahul to cover 30 km distance = $\frac{30}{s}$

Time taken by Mithun to cover 30 km distance = $\frac{30}{70-s}$

Given, total time = 2 hours 6 minutes = 2 + $\frac{6}{60}$ hours = 2 + $\frac{1}{10}$ hours = $\frac{21}{10}$ hours

$\Rightarrow \frac{30}{s} + \frac{30}{70-s} = \frac{21}{10}$

$\Rightarrow \frac{1}{s} + \frac{1}{70-s} = \frac{7}{100}$

$\Rightarrow \frac{70-s+s}{s(70-s)} = \frac{7}{100}$

$\Rightarrow \frac{70}{70s-s^2} = \frac{7}{100}$

$\Rightarrow 70s - s^2 = 1000$

$\Rightarrow s^2 - 70s + 1000 = 0$

$\Rightarrow s^2 - 50s - 20s + 1000 = 0$

$\Rightarrow s\left(s-50\right) - 20\left(s-50\right) = 0$

$\Rightarrow \left(s-50\right)\left(s-20\right) = 0$

$\Rightarrow s - 50 = 0$ or $s - 20 = 0$

$\Rightarrow$ s = 50 km/h or s = 20 km/h

When speed of Rahul = 50 km/h, speed of mithun = 20 km/h

When speed of Rahul = 20 km/h, speed of mithun = 50 km/h

$\therefore$ Difference between their speeds = 30 km/h

Hence, the correct answer is Option D

Question 12

10 men working 5 hours/day earn ₹300. How much money will 15 men working 10 hours/day earn?

A ₹ 800

B ₹ 600

C ₹ 650

D ₹ 900

Answer: D

Explanation:
Given, 10 men working 5 hours/day earn ₹300

1 man working 5 hours/day earn ₹30

15 men working 5 hours/day earn 30 x 15 = ₹450

$\Rightarrow$ 15 men working 10 hours/day earn 450 x 2 = ₹900

Question 13

P and Q can finish a work in 10 days and 5 days, respectively. Q worked for 2 days and left the job. In how many days can P alone finish the remaining work?

A 6 days

B 4 days

C 10 days

D 8 days

Answer: A

Explanation:
Let the total work be W

Number of required for P to finish the work = 10 days

=> Work done by P in 1 day = $\frac{W}{10}$

Number of required for Q to finish the work = 5 days

=> Work done by Q in 1 day = $\frac{W}{5}$

=> Work done by Q in 2 days = $\frac{2W}{5}$

Remaining work = $\mathrm{W} - \frac{2W}{5}$ = $\frac{3W}{5}$

$\therefore$ Number of days required for P to finish the remaining work = $\frac{\frac{3W}{5}}{\frac{W}{10}}$ = $\frac{3W}{5} \times \frac{10}{W}$ = 6 days

Hence, the correct answer is Option A

Question 14

Raju can finish a piece of work in 20 days. He worked at it for 5 days and then Jakob alone finished the remaining work in 15 days. In how many days can both finish it together?

A 20 days

B 12 days

C 10 days

D 16 days

Answer: C

Explanation:
Let the total work = W

Number of days required for Raju to complete the work = 20 days

=> Work done by Raju in 1 day = $\frac{W}{20}$

=> Work done by Raju in 5 days = $\frac{5W}{20} = \frac{W}{4}$

Remaining work = $W - \frac{W}{4} = \frac{3W}{4}$

∴ Work done by Jakob in 15 days = $\frac{3W}{4}$

=> Work done by Jakob in 1 day = $\frac{3W}{60} = \frac{W}{20}$

=> Work done by Raju and Jakob in 1 day = $\frac{W}{20} + \frac{W}{20} = \frac{2W}{20} = \frac{W}{10}$

=> Number of days required for both Raju and Jakob to complete the work = $\frac{W}{\frac{W}{10}} = 10$ days

Hence, the correct answer is Option C

Question 15

Ramu works 4 times as fast as Somu. If Somu can complete a work in 20 days independently, then the number of days in which Ramu and Somu together can complete the work is:

A 4 days

B 5 days

C 3 days

D 6 days

Answer: A

Explanation:
Number of days required for Somu to complete work = 20 days

Ramu works 4 times as fast as Somu

=> Number of days required for Ramu to complete work = $\frac{20}{4} = 5$ days

Let the Total Work = W

Work done by Ramu in 1 day = $\frac{W}{5}$

Work done by Somu in 1 day = $\frac{W}{20}$

Work done by Ramu and Somu in 1 day = $\frac{W}{5} + \frac{W}{20} = \frac{5W}{20} = \frac{W}{4}$

Number of days required for both Ramu and Somu together to complete work = $\frac{W}{\frac{W}{4}} = 4$ days

Hence, the correct answer is Option A

Question 16

Water flows into a tank 180 m $\times$ 140 m through a rectangular pipe of 1.2m $\times$ 0.75 m at a rate of 15 km/h. In what time will the water rise by 4 m?

A 7 hours 28 minutes

B 6 hours 42 minutes

C 8 hours 12 minutes

D 5 hours 46 minutes

Answer: A

Explanation:
Given,

Dimensions of the tank = 180 m $\times$ 140 m

Dimensions of the rectangular pipe = 1.2m $\times$ 0.75 m

Rate of water flow = 15km/h = $15 \times \frac{5}{18}$ m/s = $\frac{25}{6}$ m/s

$\therefore$ Time required to rise the water by 4 m = $\frac{180\times140\times4}{1.2\times0.75\times\frac{25}{6}}$

$= \frac{180\times140\times4\times6\times10\times100}{12\times75\times25}$

$= 26880$ sec

$= \frac{26880}{3600}$ hr

$= \frac{112}{15}$ hr

$= 7\frac{7}{15}$ hr

$=$ 7 hr + $\frac{7}{15} \times 60$ min

$=$ 7 hr 28 min

Hence, the correct answer is Option A

Question 17

A can finish a piece of work in a certain number of days. B takes 45% more number of days to finish the same work independently. They worked together for 58 days and then the remaining work was done by B alone in 29 days. In how many days could A have completed the work, had he worked alone?

A 110 days

B 118 days

C 98 days

D 120 days

Answer: B

Explanation:
Let the number of days required for A alone to complete the work = 100a

=> Number of days required for B alone to complete the work = 145a

Let the total work = W

Work done by A in 1 day = $\frac{W}{100a}$

Work done by B in 1 day = $\frac{W}{145a}$

Work done by A and B in 1 day = $\frac{W}{100a} + \frac{W}{145a} = \frac{245W}{14500a} = \frac{49W}{2900a}$

Work done by A and B in 58 days $= 58 \times \frac{49W}{2900a} = \frac{49W}{50a}$

Remaining work $= W - \frac{49W}{50a}$

Remaining work is completed by B in 29 days

=> $W - \frac{49W}{50a} = \frac{29W}{145a}$

=> $W = \frac{29W}{145a} + \frac{49W}{50a}$

=> $W = \frac{1450W+7105W}{145\times50\times a}$

=> $W = \frac{8555W}{145\times50\times a}$

=> $W = \frac{59W}{50a}$

=> $50a = 59$

=> $100a = 118$

∴ Number of days required for A alone to complete the work = 100a = 118 days

Hence, the correct answer is Option B

Question 18

Shyam can complete a task in 12 days by working 10 hours a day. How many hours a day should he work to complete the task in 8 days?

A 12

B 15

C 16

D 14

Answer: B

Explanation:
Given, Shyam can complete the task in 12 days working 10 hours a day

=> Total time required for Shyam to complete the task = 12 x 10 = 120 hours

∴ Number of hours Shyam should work in a day to complete task in 8 days = $\frac{120}{8}$ = 15 hours

Hence, the correct answer is Option B

Question 19

A boat can go 3.6 km upstream and 5.4 km downstream in 54 minutes, while it can go 5.4 km upstream and 3.6 km downstream in 58.5 minutes. The time (in minutes) taken by the boat in going 10 km downstream is:

A 48

B 50

C 45

D 54

Answer: B

Explanation:
Let the speed of speed of stream be u and speed of boat in still water be v.

Speed of boat in upstream = u - v

Speed of boat in downstream = u + v

A boat can go 3.6 km upstream and 5.4 km downstream in 54 minutes so,

Time = distance/speed

$\frac{3.6}{u-v} + \frac{5.4}{u+v} = \frac{54}{60}$

$\frac{3.6}{u-v} + \frac{5.4}{u+v} = \frac{9}{10}$

$\frac{36}{u-v} + \frac{54}{u+v} = 9$

4(u + v) + 6(u - v) = $u^2 - v^2$

10u - 2v = $u^2 - v^2$ ---(1)

Boat can go 5.4 km upstream and 3.6 km downstream in 58.5 minutes so,

$\frac{5.4}{u-v} + \frac{3.6}{u+v} = \frac{58.5}{60}$

$\frac{54}{u-v} + \frac{36}{u+v} = \frac{585}{60}$

$\frac{6}{u-v} + \frac{4}{u+v} = \frac{13}{12}$

72(u + v) + 48(u - v) = 13($u^2 - v^2$)

120u + 24v = 13($u^2 - v^2$)

Put the value of eq(1),

120u + 24v = 13 $\times$ $(10u - 2v)$

120u + 24v = 130u - 26v

10u = 50v

u = 5v ---(2)

put the value of u in eq(1),

50v - 2v = $25v^2 - v^2$

48v = 24v^2

v = 2

put the value of v in eq(2),

u = 5$\times$ 2 = 10

Speed of boat in downstream = u + v = 10 + 2 = 12

The time taken by the boat in going 10 km downstream = distance/speed = 10/12 hours = 60 $\times$ 10/12 = 50 min

Question 20

A, B and C can individually complete a task in 24 days, 20 days and 18 days, respectively. B and C start the task, and they work for 6 days and leave. The number of days required by A alone to finish the remaining task, is:

A $15\frac{2}{3}$ days

B $12\frac{1}{2}$ days

C $8\frac{4}{5}$ days

D 10 days

Answer: C

Explanation:
Let the total taskj be 360.

($\because$ LCM of 24, 20 and 18 is 360.)

Efficiency of A = 360/24 = 15

Efficiency of B = 360/20 = 18

Efficiency of C = 360/18 = 20

Task done by B and C in 6 days = total efficiency $\times$ time = (18 + 20) $\times$ 6 = 228

Remaining Task = 360 - 228 = 132

Time taken to complete remaining task by A = work/efficiency = 132/15 = 8 $\frac{12}{15}$ = 8 $\frac{4}{5}$