

# AFCAT Memory Based Paper - 14 Feb 2022

- Q1** What should come in place of question mark (?) in the following question?  
 $15\% \text{ of } 25\% \text{ of } 35\% \text{ of } 100 = ?$   
(A) 1.3125 (B) 1.2425  
(C) 1.2125 (D) 1.2627
- Q2** The average weight of first category students and second category students of a dance class are 15.2 and 14.2 respectively and the combined average weight of both the categories students is 14.8. Find the ratio of students of first category to the students of second category  
(A) 4 : 7  
(B) 2 : 5  
(C) 3 : 2  
(D) None of the above
- Q3** At what rate percent per annum simple interest a sum of Rs. 540 amounts to Rs. 693 in 20 months?  
(A) 20% (B) 17%  
(C) 15% (D) 13%
- Q4** Find the sum invested in compound interest if the amount at the end of two years and three years is Rs. 14,520 and Rs. 15,972 respectively  
(A) Rs 12000 (B) Rs 8000  
(C) Rs 10000 (D) Rs 15000
- Q5** Find the sum if the amount after 2 years is Rs. 1,94,481 at the rate of 10% per annum compounded half yearly  
(A) Rs 1,25,000  
(B) Rs 1,50,000  
(C) Rs 1,60,000  
(D) None of the above
- Q6** In an alloy, the amount of copper and Aluminium is in the ratio 3: 2. 25 kgs of the alloy is taken out and replaced with aluminum then the ratio of Copper and Aluminium in the alloy becomes 2 : 3, find the original weight of the alloy  
(A) 71 kg (B) 85 kg  
(C) 75 kg (D) 80 kg
- Q7** The ratio of S.P. of 3 articles is 40 : 37: 46 and the ratio of profit is 5 : 4: 7. The cost price of the first and second articles are the same and the cost price of the third article is 480. Find the total cost price of all three articles.  
(A) Rs 1440 (B) Rs 1350  
(C) Rs 1660 (D) Rs 1540
- Q8** The salary of two persons is the same which is equal to Rs. 12000 if the ratio of expenditure of first and second person is 5 : 4 and the ratio of the saving is 23 : 28. Find the expenditure of the second person.  
(A) Rs 5000 (B) Rs 2000  
(C) Rs 7000 (D) Rs 4000
- Q9** The ratio of first two numbers is 6 : 17 and the ratio of 3rd and 4th is 27 : 59 then what number must be added in all the numbers to make the ratio of the first two numbers same as that of 3rd and 4th  
(A) 4 (B) 6  
(C) 5 (D) 3
- Q10** Find the time taken by a train of length 225m moving with a speed of 36 km/hr to cross a platform of length 275m  
(A) 50 sec (B) 65 sec  
(C) 70 sec (D) 75 sec
- Q11** A swimmer can swim at a speed of 5 km/hr but when he starts under diving his speed increases by 10% the speed increase lasts only for the first 30m then find the approximate time taken by him to swim 50m and return back  
(A) 70.03 seconds  
(B) 60.03 seconds  
(C) 65.3 sec



(D) None of the above

**Q12** Two person A and B are at a distance of 100m, Both started towards each other on a straight path with the same speed, after traveling 20m B turns left and travels 10m and then turn right and travels 10m and again turn right and travel 10m, Now find the distance between A and B at this stage.

- (A) 15m (B) 12m  
(C) 30m (D) 20m

**Q13** A boat takes 1hr 30 min in upstream to cover a certain distance and 1 hr in downstream to cover the same distance. Find the speed of stream if the speed of boat in still water is 7.5 km/hr.

- (A) 2 km/hr (B) 1.5km/hr  
(C) 2.5km/hr (D) 1.75km/hr

**Q14** A boy is running along the edges of a square field with a speed of 2m/s along the first edge, 3m/s along the second edge, 4 m/s along the third edge and 6 m/s along the fourth edge. Find the average speed of boy during the once complete round

- (A) 2.5m/s (B) 2m/s  
(C)  $3\frac{1}{5}m/s$  (D) 3.5m/s

**Q15** A man or a woman or a boy can do a work in 4 days, 12 days, 60 days respectively. 2 men and 5 women started the work, then to complete the work in 1 day how many boys are required?

- (A) 5 boys (B) 4 boys  
(C) 6 boys (D) 7 boys

**Q16** In a garrison, there was enough food for 200 soldiers for 31 days but after 27 days 120 soldiers left the work. How long would the remaining soldiers be able to carry on with the remaining food?

- (A) 12 days (B) 11 days  
(C) 7 days (D) 10 days

**Q17** An inlet pipe takes 8 hrs to fill a tank while an outlet pipe takes 6 hrs to drain the tank. A tank full of water is attached with 8 pipes (inlet and

outlet), all pipes are opened simultaneously and the total time to drain the tank is 6 hrs then find the number of inlet pipes out of 8 pipes

- (A) 4 (B) 6  
(C) 8 (D) 7

**Q18** An article is marked 50% above the cost price, The shopkeeper gives two successive discount of 10% and 20% to the customer and in this case the profit earned by the shopkeeper is 8%. Find the cost price of the article for the shopkeeper

- (A) Rs 175 (B) Rs 100  
(C) Rs 125 (D) Rs 150

**Q19** The average time taken by 7 athletes in a race is 2 min 10 sec. If the winner completed the race in 1 min 40 sec, then the average time taken by the other athlete is

- (A) 2 min 15 sec (B) 2 min 20 sec  
(C) 2 min 35 sec (D) 2 min 10 sec

**Q20** A, B, and C can complete a work in 12, 16, and 24 days respectively. B and C worked together for 4 days then C left the work and A replaced him. In how many days will the remaining work be completed?

- (A) 7 days (B) 9 days  
(C) 5 days (D) 4 days



## Answer Key

Q1 (A)  
Q2 (C)  
Q3 (B)  
Q4 (A)  
Q5 (C)  
Q6 (C)  
Q7 (A)  
Q8 (A)  
Q9 (C)  
Q10 (A)

Q11 (A)  
Q12 (D)  
Q13 (B)  
Q14 (C)  
Q15 (A)  
Q16 (D)  
Q17 (A)  
Q18 (B)  
Q19 (A)  
Q20 (D)

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## Hints & Solutions

### Q1 Text Solution:

#### Calculation

$$\Rightarrow 15\% \text{ of } 25\% \text{ of } 35\% \text{ of } 100 = ?$$

$$\Rightarrow \frac{15}{100} \times \frac{25}{100} \times \frac{35}{100} \times 100 = ?$$

$$\Rightarrow \frac{13125}{10000} = 1.3125$$

### Q2 Text Solution:

#### Formula Used

$$\text{Average} = \frac{\text{Sum of Observation}}{\text{Number of Observation}}$$

#### Calculation

Let the number of students in be 1st and 2nd categories be x and y

then, Sum of weight in the 1st category student = average of students =  $15.2 \times x = 15.2x$

Similarly for 2nd Category students sum =  $14.2 \times y = 14.2y$

Combined Average i.e, (x+y) student = 14.8

Adding 1st and 2nd student categories comparing with combined we get

$$\Rightarrow 15.2x + 14.2y = 14.8(x + y)$$

$$\Rightarrow 15.2x + 14.2y = 14.8x + 14.8y$$

$$\Rightarrow 0.4x = 0.6y$$

$$\Rightarrow \frac{x}{y} = \frac{0.6}{0.4} = \frac{3}{2}$$

### Q3 Text Solution:

#### Calculation

$$\text{Interest in 20 months} = Rs\ 693 - 540 = 153$$

$$\Rightarrow SI = 153$$

$$\text{Now we know, } SI = \frac{P \times R \times T}{100}$$

$$P = 540$$

$$R = ?$$

$$T = 20 \text{ months} = \frac{20}{12} \text{ years}$$

Putting value in the formula

$$\Rightarrow 153 = \frac{540 \times R \times \frac{20}{12}}{100}$$

$$\Rightarrow R = \frac{153 \times 100 \times 12}{540 \times 20}$$

$$\Rightarrow R = 17\%$$

### Q4 Text Solution:

#### Formula Used

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

### Calculation

Amount at the end of the 2 year

$$14,520 = P\left(1 + \frac{r}{100}\right)^2 \dots\dots\dots(1)$$

Amount at the end of the 3 year

$$15,972 = P\left(1 + \frac{r}{100}\right)^3 \dots\dots\dots(2)$$

Dividing 2 by 1

$$\Rightarrow \frac{15,972}{14,520} = \left(1 + \frac{r}{100}\right)$$

$$\Rightarrow 1.1 = 1 + \frac{r}{100}$$

$$\Rightarrow r = 10\%$$

For the principal Put the value in any eqn

$$\Rightarrow 14520 = P\left(1 + \frac{10}{100}\right)^2$$

$$\Rightarrow P = \frac{14520 \times 10 \times 10}{11 \times 11} = 12000$$

### Q5 Text Solution:

#### Formula Used

For a half-yearly compounded

$$A = P\left(1 + \frac{r}{100}\right)^{2n}$$

#### Calculation

Amount = 1,94,481

$$R = 10\%$$

$$T = 2 \times 2 = 4$$

Putting the values in the formula

$$\Rightarrow 1,94,981 = P\left(1 + \frac{10}{100}\right)^4$$

$$\Rightarrow 1,94,981 = P \times \left(\frac{21}{20}\right) \times \left(\frac{21}{20}\right) \times \left(\frac{21}{20}\right) \times \left(\frac{21}{20}\right)$$

$$\text{On solving } P = 1,60,000$$

### Q6 Text Solution:

#### Calculation

Ratio = 3: 2

Let the composition be 3x and 2x for copper and aluminum

25 kg of the alloy are taken out

The remaining amount of Copper =  $3x - 25 \times \left(\frac{3}{5}\right) = 3x - 15$

The remaining amount of aluminum =  $2x - 25 \times \left(\frac{2}{5}\right) = 2x - 10$

Now 25 kg of alloy replaced by aluminum =  $2x - 10 + 25 = 2x + 15$



Now remaining copper and replaced aluminum are in the ratio

$$\Rightarrow \frac{3x-15}{2x+15} = \frac{2}{3}$$

$$\Rightarrow 9x - 45 = 4x + 30$$

$$\Rightarrow x = 15$$

So, the original weight was

$$3x + 2x = 5x = 5 \times 15 = 75 \text{ kgs}$$

#### Q7 Text Solution:

##### Calculation

Ratio = 40 : 37 : 46

The ratio of profit = 5 : 4 : 7 i.e., 5z, 4z, 7z

Let the SP of three articles be 40x, 37x, 46x

Now

3rd article CP is given = 480

$$\text{Profit} = \frac{SP-CP}{CP} \times 100 = \frac{7z}{100}$$

$$= \left( \frac{46x-480}{480} \right)$$

$$\Rightarrow 336z = 460x - 4800$$

For 1st article

$$\Rightarrow \frac{5z}{100} = \frac{(40x-CP_1)}{CP_1}$$

$$\Rightarrow CP_1 = \frac{40x}{0.05z+1}$$

For 2nd article

$$\Rightarrow CP_2 = \frac{37x}{0.04z+1}$$

we know  $CP_1 = CP_2$

$$\frac{40x}{0.05z+1} = \frac{37x}{0.04z+1}$$

By solving we get

$$z = 12$$

Putting the value in 1st article

$$\text{we get } \frac{40x}{0.05 \times 12 + 1}$$

$$x = 19.2$$

$$\text{So, the sum will be } 2 \times 480 + 480 = 1440$$

#### Q8 Text Solution:

##### Calculation

$$\text{Expenditure} = \text{Salary} - \text{Savings}$$

$$\text{Expenditure of 1st person} = 12000 - 23x$$

$$\text{Expenditure of 2nd person} = 12000 - 28x$$

Now, the ratio of expenditure

$$\Rightarrow \frac{12000-23x}{12000-28x} = \frac{5}{4}$$

$$\Rightarrow 48000 - 92x = 60000 - 140x$$

$$\Rightarrow x = 250$$

Then, the expenditure of the second person

$$12000 - 28 \times 250 = 5000$$

#### Q9 Text Solution:

##### Calculation

ratio of the first two numbers is 6: 17

ratio of 3rd and 4th is 27 : 59

Let the required number be x if we add x into first and second number

Then,

$$\Rightarrow \frac{6+x}{17+x} = \frac{27+x}{59+x}$$

$$\Rightarrow (6+x)(59+x)$$

$$= (17+x)(27+x)$$

$$\Rightarrow 354 + 65x + x^2 = 459 + 44x + x^2$$

$$\Rightarrow 21x = 105$$

$$\Rightarrow x = 5$$

#### Q10 Text Solution:

##### Calculation

Speed of train = 36km/hr

Total distance travelled by train = (train+platform)

Length

$$\text{Total distance} = 225\text{m} + 275 \text{ m} = 500\text{m}$$

Time taken to cross the 500m distance =

$$\frac{\text{Distance}}{\text{speed}}$$

Now, converting 36km/hr into m/s =

$$36 \times \frac{5}{18} = 10\text{m/s}$$

$$\text{Time} = \frac{500}{10} = 50 \text{ sec}$$

#### Q11 Text Solution:

##### Calculation

Total distance covered by swimmer

$$= 50\text{m} + 50\text{m} = 100\text{m}$$

$$\text{Speed} = 5\text{km/hr} = 5 \times \frac{5}{18} = \frac{25}{18}$$

Speed increased by 10% at the time of diving for the first

$$30 \text{ m} = 5 + 10\% \text{ of } 5 = 5.5\text{km/hr} = 5$$

$$.5 \times \frac{5}{18} = \frac{27.5}{18} \text{ m/sec}$$

Now time taken to cover the first 30 m =

$$\frac{\text{Distance}}{\text{speed}} = \frac{30\text{m}}{\left(\frac{27.5}{18}\right) \text{ m/s}} = 19.63 \text{ sec}$$

Time is taken to cover the Remaining distance i.e.,

$$70\text{m} \text{ is } = \frac{70\text{m}}{\left(\frac{25}{18}\right)} = 50.4 \text{ sec}$$

$$\text{Total time} = 19.63 + 50.4 \text{ sec} = 70.03 \text{ sec}$$



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**Q12 Text Solution:****Calculation**

When B covers 20 m A also covers 20m

Now distance between them  
 $= 100 - 40 = 60m$

Now B turns left and moves 10m but A moves straight 10m

So distance between them  
 $= 60 - 10 - 20 = 30m$

Now B turns right and moves 10m towards the same path A and A also cover 10m straight

So, the Remaining Distance between them  
 $= 30 - 10 = 20m$

**Q13 Text Solution:****Calculation**

Let the speed of the stream be  $x$

Now, the distance traveled in upstream = Distance traveled in downstream

$$\Rightarrow (7.5 - x) \times 1.5 = (7.5 + x) \times 1$$

$$\Rightarrow 7.5 \times 0.5 = 2.5x$$

$$\Rightarrow x = \frac{3.75}{2.5} = 1.5 \text{ Km/hr}$$

**Q14 Text Solution:****Calculation**

Speed of boy along the edges = 2, 3, 4, 6m/s

Taking the  $LCM(2, 3, 4, 6) = 12$

Now, let the length of each edge be 12m

$$\text{Average speed} = \frac{\text{Total Distance}}{\text{Total time}}$$

Now time Taken by boy to cover edges for 1st edge =  $\frac{12}{2} = 6$

similarly for remaining edges  
 $= (\frac{12}{3}, \frac{12}{4}, \frac{12}{6}) = 4, 3, 2$

$$\text{Now Average speed} = \frac{(12 \times 4)}{(6+4+3+2)} = \frac{48}{15} = 3\frac{1}{5} \text{ m/s}$$

**Q15 Text Solution:****Calculation**

A man, woman, boy can do work in 4, 12, 60 days  
 $LCM(4, 12, 60) = 60 \text{ unit}$

So the Efficiency of man =  $\frac{60}{4} = 15 \text{ unit/day}$

Woman Efficiency =  $\frac{60}{12} = 5 \text{ unit/day}$

Efficiency of Boy =  $\frac{60}{60} = 1 \text{ unit/day}$

Now, work done by 2 men and 5 women in 1 day

$$= 2 \times 15 + 5 \times 5 = 55 \text{ unit}$$

Now Remaining work =  $60 - 55 = 5 \text{ unit}$

The remaining work will be done by a boy in  
 $= \frac{5}{1} = 5 \text{ days}$

**Q16 Text Solution:****Calculation**

Let the required number of days be  $D$

The remaining food was for 200 soldiers for 4 days and this food will be consumed by the remaining 80 soldiers

$$\frac{M_1 \times D_1}{W_1} = \frac{M_2 \times D_2}{W_2}$$

$$\Rightarrow 200 \times 4 = 80 \times D$$

$$\Rightarrow D = 10 \text{ days}$$

**Q17 Text Solution:****Calculation**

Let the number of inlet pipes be  $x$

So, the number of outlet pipes be  $(8-x)$

Capacity of tank =  $LCM(8, 6) = 24 \text{ litres}$

Efficiency of an inlet pipe =  $\frac{24}{8} = 3 \text{ litres/hr}$

The efficiency of  $x$  inlet pipes =  $3x \text{ litres/hr}$

Efficiency of an Outlet pipes =  $-4(8-x) \text{ litres/hr}$

$$(3x \times 6) + (-4(8-x) \times 6) = -24$$

$$\Rightarrow 18x - 192 + 24x = -24$$

$$\Rightarrow 42x = 168$$

$$\Rightarrow x = 4$$

**Q18 Text Solution:****Calculation**

Let the CP of article be  $100x$

$$MP = 100x + 50\% \text{ of } 100x = 150x$$

Total discount

$$= -10 - 20 + \frac{10 \times 20}{100} = -28\%$$

$$\text{Selling price} = 150x - 28\% \text{ of } 150 = 108x$$

$$\text{Profit} = 108x - 100x = 8x$$

$$\text{Now } 8x = 8$$

$$\Rightarrow x = 1$$

$$\text{So, the CP of article} = 100 \times 1 = 100$$

**Q19 Text Solution:****Calculation**

Time taken by 7 athletes =

$$7 \times (130 \text{ sec}) = 910 \text{ sec}$$

which is 15 min 10 sec



$$\begin{aligned} & \text{Average time taken by other athlete} \\ &= \frac{(15\text{min } 10\text{sec} - 1\text{min } 40\text{sec})}{6} = \frac{(910\text{sec} - 100\text{sec})}{6} \\ &= \frac{810}{6} \end{aligned}$$

Which is 2 min 15 sec

So, the average time is 2 min 15 sec

#### Q20 Text Solution:

##### Calculation

Total work;

$$LCM \text{ of } 12, 16 \text{ and } 24 = 48$$

$$\text{Efficiency A} = \frac{48}{12} = 4 \text{ units/day}$$

$$\text{Efficiency B} = \frac{48}{16} = 3 \text{ units/days}$$

$$\text{Efficiency C} = \frac{48}{24} = 2 \text{ units/day}$$

Time taken by B and C together for 4 days =

$$(4 \times (3 + 2)) = 4 \times 5 = 20 \text{ units}$$

$$\text{Remaining work} = 48 - 20 = 28 \text{ units}$$

Now, the time taken by A and B to complete the

$$\text{remaining work} = \frac{28}{3+4} = \frac{28}{7} = 4 \text{ days}$$



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