

AFCAT Memory Based Paper – 27 Aug 2022

- Q1** A milkman makes 20% profit by selling milk mixed with water at Rs 8 per litre. If the cost price of pure milk is Rs 10 per litre then the ratio of milk and water in the given mixture?
 (A) 2:1 (B) 2:3
 (C) 3:4 (D) 4:5
- Q2** The ratio of efficiencies of X and Y for doing a certain work is 5 : 9. Working together, they can complete a work in 15 days. X alone will complete $66\frac{2}{3}\%$ of the same work in?
 (A) 23 days (B) 27 days
 (C) 28 days (D) 35 days
- Q3** Which of the following fractions can be written as a non-terminating decimal?
 (A) $\frac{11}{250}$ (B) $\frac{21}{28}$
 (C) $\frac{7}{18}$ (D) $\frac{15}{75}$
- Q4** What is the compound interest on a sum of Rs 19,500 invested for $1\frac{2}{5}$ years at 10% p.a interest compound annually?
 (A) Rs 2560 (B) Rs 2300
 (C) Rs 2250 (D) Rs 2808
- Q5** Simplify $11\frac{1}{9}\% \text{ of } 9\frac{1}{11}\% \text{ of } 7\frac{1}{7}\% \text{ of } 6\frac{1}{4}\% \text{ of } 11088$
 (A) $11\frac{1}{4}$ (B) 0.5
 (C) 3.2 (D) 7
- Q6** Value of the expression $\frac{2.25^2 - 1.25^2}{2.25 - 1.25}$
 (A) 4.7 (B) 5.6
 (C) 4.2 (D) 3.5
- Q7** A train 100 metre long, moving at a speed of 50 km per hour, crosses another train 120 metre long coming from the opposite direction in 6 seconds. What is the speed of the second train?
 (A) 82 kmph (B) 75 kmph
 (C) 79 kmph (D) 88 kmph
- Q8** A train leaves Meerut at 5 a.m. and reaches Delhi at 9 a.m. Another train leaves Delhi at 7 a.m. and reaches Meerut at 10:30 a.m. At what time do the two trains cross each other?
 (A) 2 hour 48 min (B) 4 hour 58 min
 (C) 2 hour 56 min (D) 3 hour 15 min
- Q9** The simple interest on a certain sum of money at the rate of 5 p.a for 8 years is Rs 840. The rate of interest for which the same amount of interest can be received on the same sum after 5 years is
 (A) 9.5% (B) 8%
 (C) 7% (D) 11%
- Q10** The average age of a man and his son is 40 years. The ratio of their ages is 11 : 5 respectively. What is the son's age?
 (A) 25 years (B) 30 years
 (C) 27 years (D) 40 years
- Q11** Which one among the following is the largest?
 (A) $\frac{3}{4}$ (B) $\frac{10}{13}$
 (C) $\frac{11}{14}$ (D) $\frac{7}{9}$
- Q12** Out of four numbers, the average of the first three is 16 and that of the last three is 15. If the last number is 21 then the first number is:
 (A) 24 (B) 26
 (C) 28 (D) 22
- Q13** A shopkeeper buys 2 dozen bananas at Rs 16 per dozen. After selling 18 bananas at the rate of Rs 12 per dozen, the shopkeeper reduced the rate to Rs 4 per dozen. find the loss percentage.
 (A) 37.5% (B) 25%
 (C) 25% (D) 12.5%
- Q14** A container contains 40 litres of milk. From this container, 4 litres of milk were taken out and replaced by water. This process was repeated



further two times. How much milk is now contained by the container?

- (A) 29.16 (B) 27
(C) 25.54 (D) 30.5

Q15 Two dice are thrown together. What is the probability that the sum of the numbers on the two faces is divisible by 4 or 6?

- (A) $\frac{5}{9}$ (B) $\frac{7}{9}$
(C) $\frac{5}{18}$ (D) $\frac{7}{18}$

Q16 The denominator of a fraction is 4 more than twice the numerator. When both the numerator and denominator are decreased by 6, then the denominator becomes 12 times the numerator. Determine the fraction

- (A) $\frac{5}{7}$ (B) $\frac{7}{22}$
(C) $\frac{4}{15}$ (D) $\frac{7}{18}$

Q17 94 is divided into two parts in such a way that the fifth part of the first and the eighth part of the second are in the ratio 3 : 4 The first part is:

- (A) 50 (B) 45
(C) 64 (D) 30

Q18 The area of a circular field is 13.86 hectares. Find the cost of fencing it at the rate of Rs 4.40 per metre

- (A) 5066 (B) 5168
(C) 5808 (D) 6208

Q19 1 lakh books can be printed by machine P in 8 hours, one lakh books by machine Q in 10 hours, and one lakh books by machine R in 12 hours. The machines begin operating at 9 A.M in the morning. Machine P closes at 11 A.M in the morning, and the other two machines finish their work. What time will the work(print 1 lakh books) be completed approximately?

- (A) 2 P.M (B) 4 P.M
(C) 5 P.M (D) 1 P.M

Q20 At what time between 3 o'clock and 4 o'clock, both the hands of a clock will coincide with each other?

- (A) 3 hour $\frac{1}{5}$ min

(B) 3 hour $16\frac{4}{11}$ min

(C) 3 hour 15 min

(D) None of the above



Answer Key

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

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



Hints & Solutions

Q1 Text Solution:

Given

The cost price of pure milk = Rs 10/litre

The selling price of the mixture = Rs8/litre

Profit = 20%

The cost price of pure milk is Rs 10 per litre

Calculation

Cost price of 1 litre mixture = $8 \times \frac{100}{120} = \text{Rs } \frac{20}{3}$

Cost of water = Rs 0

Remaining cost = $\text{Rs} \left(10 - \frac{20}{3}\right) = \text{Rs } \frac{10}{3}$

ratio of *water : milk* = $\frac{\left(\frac{10}{3}\right)}{\left(\frac{20}{3}\right)} = \frac{1}{2}$

So, the ratio of milk : water = 2 : 1

Q2 Text Solution:

Given

Ratio of Efficiencies = 5 : 9

Formula Used

Total work = *Efficiency* \times *total time*

Calculation

Total Efficiency of X and Y
= (5 + 9) = 14 *units*

Total time taken by both X & Y together
= 15 *days*

Total work = 14 \times 15 = 210 *units*

Now,

X can alone complete

$66\frac{2}{3}\%$ of the total work

Total work $\times 66\frac{2}{3}\%$

$\Rightarrow 210 \times 66\frac{2}{3}\%$

$\Rightarrow 210 \times \frac{200}{300} = 140$ *units*

Time taken by X to complete 140 units

$\Rightarrow \frac{140}{5} = 28$ *days*

Q3 Text Solution:

Calculation

Out of four fractions check the fraction for Non-terminating decimal

$\Rightarrow \frac{11}{250} = 0.044$ (Terminating decimal)

$\Rightarrow \frac{21}{28} = 0.75$ (Terminating decimal)

$\Rightarrow \frac{7}{18} = 0.388\ldots = 0.\overline{38}$ (Non-terminating Decimal)

$\Rightarrow \frac{15}{75} = 0.2$ (Terminating decimal)

Hence, **Option C** is correct

Q4 Text Solution:

Calculation

Interest rate for $\frac{2}{5}$ years = $10 \times \left(\frac{2}{5}\right) = 4\%$

We know that the amount equal to,

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

For $1\frac{2}{5}$ years Amount will be

$\Rightarrow A = 19500\left(1 + \frac{10}{100}\right)^1 \times \left(1 + \frac{10}{100}\right)^{\frac{2}{5}}$

$\Rightarrow A = 19500\left(1 + \frac{10}{100}\right)^1 \times \left(1 + \frac{4}{100}\right)$

$\Rightarrow A = 19500\left(1 + \frac{1}{10}\right) \times \left(1 + \frac{1}{25}\right)$

$\Rightarrow A = 19500\left(\frac{11}{10}\right) \times \left(\frac{26}{25}\right)$

$\Rightarrow A = 22308$

Interest = 22308 - 19500 = 2808

Q5 Text Solution:

Calculation

We can write these percentages as fraction value

$\Rightarrow 11\frac{1}{9}\% = \frac{1}{9}$

$\Rightarrow 9\frac{1}{11}\% = \frac{1}{11}$

$\Rightarrow 7\frac{1}{7}\% = \frac{1}{14}$

$\Rightarrow 6\frac{1}{4}\% = \frac{1}{16}$

So the expression can be written as

$\frac{1}{9}$ of $\frac{1}{11}$ of $\frac{1}{14}$ of $\frac{1}{16}$ of 11088 = ?

$\Rightarrow \frac{1}{9}$ of $\frac{1}{11}$ of $\frac{1}{14}$ of 693

$\Rightarrow \frac{1}{9}$ of $\frac{1}{11}$ of 49.5

$\Rightarrow \frac{1}{9}$ of 4.5

$\Rightarrow 0.5$

Q6 Text Solution:

Calculation

Using the identity

$(a - b)(a + b) = (a^2 - b^2)$

$\frac{2.25^2 - 1.25^2}{2.25 - 1.25} = \frac{(2.25 - 1.25)(2.25 + 1.25)}{(2.25 - 1.25)}$

$\Rightarrow (2.25 + 1.25)$

$\Rightarrow 3.5$



Value of the expression is 3.5

Q7 Text Solution:**Calculation**

Let the speed of the train is V

Distance covered =

$$(Relative\ speed\ of\ the\ train) \times time$$

$$\Rightarrow (100 + 120)m = (50 + V) \times 6\ sec$$

$$\Rightarrow 220\ m = (50 + V) \times 6\ sec$$

$$\Rightarrow \frac{220}{1000} km = (50 + V) \times \left(\frac{6}{3600}\right) hr$$

Solving above equation

$$\Rightarrow 22 = (50 + V) \times \frac{1}{6}$$

$$\Rightarrow 22 \times 6 = (50 + V)$$

$$\Rightarrow V = 132 - 50 = 82\ kmph$$

Q8 Text Solution:**Calculation**

Time taken by train 1 = 4 hours

Time taken by train 2 = 3.5 = $\frac{7}{2}$ hours

Let the Distance B/w Meerut and Delhi is 28 km (LCM of 4 & $\frac{7}{2}$)

then, the Speed of train 1 = $\frac{28}{4} = 7\ km/hr$

Speed of train 2 = $\frac{28}{3.5} = 8\ km/hr$

Relative speed = Speed of train 1 + Speed of train 2

$$\Rightarrow Relative\ speed = 7 + 8 = 15\ km$$

Distance travel by train 1 before starting off train

$$2 = speed\ of\ train\ 2 \times time$$

$$\Rightarrow 7 \times 2 = 14\ km$$

$$Remaining\ distance = 28 - 14 = 14\ km$$

Time to cross each other =

$$\frac{Remaining\ distance}{Relative\ speed} = \frac{14}{15}\ or\ 56\ minutes$$

$$Total\ time\ is = 2\ hour + 56\ min$$

Q9 Text Solution:**Calculation**

According to question

Simple Interest is the same in both conditions

so,

$$\Rightarrow SI = \frac{P \times R \times T}{100}$$

$$\Rightarrow P \times 8 \times \frac{5}{100} = P \times 5 \times \frac{R}{100}$$

$$\Rightarrow \frac{40}{100} = \frac{R}{20}$$

$$\Rightarrow R = 8\%$$

Q10 Text Solution:**Calculation**

Total age = Average age \times number of people

Total age of man and his son = $40 \times 2 = 80\ years$

The ratio of their ages = 11 : 5

Let the ratio of age of man and son be $11x : 5x$

$$\Rightarrow 11x + 5x = 80$$

$$\Rightarrow x = 5\ years$$

Age of son = $5x$

$$\Rightarrow 5 \times 5 = 25\ years$$

Q11 Text Solution:**Calculation**

Converting the fractions into decimal

$$\Rightarrow \frac{3}{4} = 0.75$$

$$\Rightarrow \frac{10}{13} = 0.76$$

$$\Rightarrow \frac{11}{14} = 0.78$$

$$\Rightarrow \frac{7}{9} = 0.77$$

Hence, the correct answer is **Option C**

Q12 Text Solution:**Calculation**

$$Average = \frac{Sum\ of\ observation}{Number\ of\ observation}$$

The last total of 3 number = $3 \times 15 = 45$

So the middle 2 numbers will add to $45 - 21 = 24$

The first 3 numbers total the Average = $3 \times 16 = 48$

So the first number is $48 - 24 = 24$

Q13 Text Solution:**Calculation**

The cost price of 2 dozen bananas = $2 \times 16 = Rs\ 32$

$$SP\ of\ 18\ bananas = \frac{18}{12} \times 12 = Rs\ 18$$

Now Out of 24 bananas 18 were sold Rest 6 was sold at,

$$SP\ of\ Remaining\ bananas = \frac{6}{12} \times 4 = Rs\ 2$$

$$Total\ SP = 18 + 2 = 20\ Rs$$

$$Loss = \frac{32 - 20}{32} \times 100 = 37.5\%$$

Q14 Text Solution:**Calculation**

Quantity of pure milk = 40 litre

4 litres of milk is replaced by water 3 times

Quantity of pure liquid in the final mixture
 $= A \left[1 - \left(\frac{B}{A} \right) \right]^n$

Where A is Quantity of pure milk

B is quantity of milk replaced by water

n represent how many times water replaced by milk = 3

putting the value of A and B in above equation

$$\Rightarrow 40 \times \left[1 - \left(\frac{4}{40} \right) \right]^3$$

$$\Rightarrow 40 \times \left[1 - \left(\frac{1}{10} \right) \right]^3$$

$$\Rightarrow 40 \times \left(\frac{729}{1000} \right) = 29.16$$

Q15 Text Solution:

Formula Used

$$P(E) = \frac{n(E)}{n(S)}, \text{ where}$$

$n(E)$ = Number of favorable outcomes

$n(S)$ = Number of Possible Outcomes

Calculation

Number of possible Outcomes

$$n(S) = 6^2 = 36$$

Now, a Multiple of 4 are 4, 8, 12, 16, 20, 24, 28, 32, 36

Multiple of 6 are 6, 12, 18, 24, 30, 36

Number of favorable outcomes $n(E) = 14$

$$\text{Probability } P(E) = \frac{14}{36} = \frac{7}{18}$$

Q16 Text Solution:

Calculation

Let the required fraction is $\frac{x}{y}$

According to the question

$$y = 2x + 4 \dots \dots (1)$$

fraction decreased by 6

$$\Rightarrow \frac{(x-6)}{(y-6)}$$

Again, According to the question

$$(y - 6) = 12(x - 6)$$

$$\Rightarrow y - 6 = 12x - 72$$

From the equation (1)

$$(2x + 4) - 6 = 12x - 72$$

$$\Rightarrow 10x = 70$$

$$\Rightarrow x = 7$$

Again, From the equation (1)

$$y = 2 \times 7 + 4$$

$$y = 18$$

So, the fraction will be $\frac{7}{18}$

Q17 Text Solution:

Calculation

Let the first & second parts be x & y respectively.

According to the question

$$\Rightarrow \left(\frac{x}{5} \right) : \left(\frac{y}{8} \right) = \frac{3}{4}$$

Cross Multiplying the above equation

$$\Rightarrow \frac{8x}{5y} = \frac{3}{4}$$

$$\Rightarrow \frac{x}{y} = \frac{15}{32} = z \dots \dots (z \text{ is some constant})$$

$$\Rightarrow x = 15z, y = 32z$$

Sum of two parts = 94

$$\Rightarrow 15z + 32z = 94$$

$$\Rightarrow 47z = 94 \text{ or } z = 2$$

$$\text{Hence, } x = 15z = 15 \times 2 = 30$$

First part is 30

Q18 Text Solution:

Calculation

Area of the circular field = 13.86 hectares

$$\Rightarrow 1 \text{ hectares} = 10000$$

The area of the field = $\pi r^2 \dots \dots \dots$ (r=radius of the circular field)

$$\Rightarrow \pi(r)^2 = 13.86$$

$$\Rightarrow \left(\frac{22}{7} \right) r^2 = 13.86 \times 10000$$

Solving the above expression

$$\Rightarrow r^2 = \frac{7}{22} \times 138600$$

$$\Rightarrow r^2 = 44100$$

$$\Rightarrow r = 210m$$

Length of the circular field = $2\pi r$

$$\Rightarrow 2\pi r = 2 \times \frac{22}{7} \times 210 = 1320 m$$

Cost of fencing the circular field

$$= 4.40 \text{ per metre}$$

$$\Rightarrow 1320 \times 4.4 = 5808$$

$$\text{Cost of fencing the circular field} = 5808 Rs$$

Q19 Text Solution:

Calculation

We know, $\text{time taken} = \frac{1}{\text{Efficiency}}$

$$\text{Efficiency of P} = \frac{1}{8}$$

$$\text{Efficiency of Q} = \frac{1}{10}$$

$$\text{Efficiency of R} = \frac{1}{12}$$



Work done by $P + Q + R$ in 1 hour

$$\Rightarrow \frac{1}{8} + \frac{1}{10} + \frac{1}{12} = \frac{(15+12+10)}{120}$$

$$\Rightarrow \frac{37}{120}$$

P, Q, and R work for 2 hours 9 A.M to 11 A.M

$$\Rightarrow \frac{37}{120} \times 2 = \frac{37}{60}$$

Remaining work is

$$\Rightarrow 1 - \frac{37}{60} = \frac{23}{60}$$

\Rightarrow Work done by Q and R in an hour

$$\Rightarrow \left(\frac{23}{60}\right) \div \left(\frac{11}{60}\right)$$

$$\Rightarrow \left(\frac{23}{60}\right) \times \left(\frac{60}{11}\right) = \frac{23}{11} \approx 2 \text{ hour}$$

So, add 2 hours in 11 A.M we get 1 P.M

Q20 Text Solution:

Formula Used

The angle between the hour-hand and minute-hand

$$\theta = \left(30H - \frac{11M}{2}\right)$$

When minute and hour hands coincide then,

$$\theta = 0$$

$$\Rightarrow 0 = 30 \times 3 - \frac{11M}{2}$$

$$\Rightarrow 0 = 90 - \frac{11M}{2}$$

$$\Rightarrow 90 = \frac{11M}{2}$$

$$\Rightarrow M = 16\frac{4}{11} \text{ minutes}$$

So, the both hand will coincide at

$$3 \text{ hour } 16\frac{4}{11} \text{ min}$$



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