

# AFCAT MBT 10 Aug shift-1 2024

## AFCAT

### Numerical Aptitude

**Q1** One card is picked from the deck. what will be the probability that this will be a red colour prime number?

- (A)  $\frac{2}{13}$  (B)  $\frac{5}{13}$   
(C)  $\frac{5}{8}$  (D) None of these

**Q2** In 28 liter mixture of milk and water, the ratio of milk and water is 5:2. If 2 liters of water is added to this mixture, what will be the ratio of milk and water in the new mixture?

- (A) 1 : 3 (B) 2 : 1  
(C) 3 : 5 (D) 4 : 7

**Q3** A company undertakes to supply 4000 pieces of a particular equipment at ₹50 per piece. According to its estimates, even if 10% fail to pass the quality test, it will still make a gain of 25%. However, later it is found that 50% of the equipment has been rejected completely. What is the loss to the company?

- (A) ₹ 36000 (B) ₹ 44000  
(C) ₹ 40000 (D) ₹ 27000

**Q4** A circle is drawn in a manner that it touches all the corners of square with 14 cm diagonal, find area of the circle

- (A)  $105 \text{ cm}^2$   
(B)  $205 \text{ cm}^2$   
(C)  $310 \text{ cm}^2$   
(D)  $154 \text{ cm}^2$

**Q5** The wheat sold by a grocer contained 10% low-quality wheat. What quantity of good quality weed should be added to 150 g of wheat, so the percentage of bad quality wheat becomes 5%?

- (A) 150g (B) 200g  
(C) 300g (D) 400g

**Q6**

15 men, 18 women and 12 boys working together earned Rs 2070 If the daily wages of a man, a woman and a boy are in the ratio 4: 3: 2 the daily wages (in Rs) of 1 man, 2 women and 3 boys are

- (A) Rs 240 (B) Rs 270  
(C) Rs 300 (D) Rs 235

**Q7** Anuj goes at a speed of 20 km/hr and returns from that at a speed of 30 km/hr. If he takes 10 hours to complete the journey, find out the total distance covered by him.

- (A) 200 km (B) 240 km  
(C) 300 km (D) 350 km

**Q8** A man engaged a servant on a condition that he would pay him Rs. 80 and a pair of jeans after service of one year. Servant served for only 9 months and receives a pair of jeans and an amount of Rs. 55. The price of the jeans is \_\_\_\_\_.

- (A) Rs. 80 (B) Rs. 60  
(C) Rs. 40 (D) Rs. 20

**Q9** A candidate scores 25% and fails by 32 marks, while another candidate who scores 40% marks, gets 28 marks more than the minimum required marks to pass the examination. How many marks did a candidate score if he scored 72% marks?

- (A) 288 (B) 275  
(C) 250 (D) 300

**Q10** A boat takes 90 minutes less to travel 36 miles downstream than to travel the same distance upstream. If the speed of the boat in still water is 10 mph , the speed of the stream is:

- (A) 2mph (B) 2.5 mph  
(C) 4 mph (D) 5 mph

**Q11**



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$$\frac{\frac{1}{3} + \frac{3}{4} + \left(\frac{2}{5} - \frac{1}{3}\right)}{1\frac{2}{3} \text{ of } \frac{3}{4} - \frac{1}{4} \text{ of } \frac{4}{5}} = ?$$

- (A)  $\frac{3}{7}$  (B)  $\frac{26}{21}$   
(C)  $\frac{23}{21}$  (D) None of these

**Q12** By selling a book for Rs. 10, the publisher loses  $\frac{1}{11}$  of what it costs him. His cost price is

- (A) Rs 15 (B) Rs 18  
(C) Rs 11 (D) Rs 13

**Q13** Three taps A, B, and C can fill a tank in 12, 15 and 20 hours respectively. If A is opened all the time and B and C are open for one hour each alternately starting with A and B, the tank will be full in:

- (A) 5 hrs (B) 7 hrs  
(C) 4 hrs (D) 5 hrs

**Q14** The sum of the digits of a two-digit number is 9. Also, nine times this number is twice the number obtained by reversing the order of the digits. Find the number.

- (A) 18 (B) 20  
(C) 30 (D) 40

**Q15** A man spends 40% of his monthly income on food and one-third of the remaining on transport. If he saves Rs. 4500 per month, which is half of the money left after spending on food and transport, his monthly salary is

- (A) Rs 11000 (B) Rs 22500  
(C) Rs 22000 (D) Rs 40000

**Q16** The compound interest on Rs. 16000 for 9 months at 20% p.a. compounded quarterly is

- (A) Rs 2522 (B) Rs 2200  
(C) Rs 3000 (D) Rs 4000

**Q17** The average annual income (in Rs.) of certain agricultural workers is S and that of other workers is T. The number of agricultural workers is 11 times that of other workers. Then the average monthly income (in Rs.) of all the workers is

- (A)  $\frac{11S+T}{2}$  (B)  $\frac{11S+T}{12}$

(C)  $\frac{S+T}{2}$

(D)  $\frac{11S+10T}{12}$

**Q18** Rs. 5000 was lent at a certain rate of simple interest and Rs. 4000 at a rate 1% more per annum than this rate. If the simple interest of both of them is same in 4 years, then at what rate per annum was the first money given?

- (A) 4%  
(B) 5%  
(C)  $6\frac{2}{3}\%$   
(D) 10%

**Q19** The area of a square ground is 576 km<sup>2</sup>. How long will it take for a dog to run around at the speed of 12 km/h?

- (A) 12 h (B) 10 h  
(C) 8 h (D) 6 h

**Q20** A and B can finish a work together in 30 days. They worked together for 20 days and then B left. After another 20 days, A finished the remaining work. In how many days, A alone can finish the work?

- (A) 50 days  
(B) 60 days  
(C) 48 days  
(D) 54 days



## Answer Key

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Q1 (A)

Q2 (B)

Q3 (B)

Q4 (D)

Q5 (A)

Q6 (A)

Q7 (B)

Q8 (D)

Q9 (A)

Q10 (A)

Q11 (C)

Q12 (C)

Q13 (B)

Q14 (A)

Q15 (B)

Q16 (A)

Q17 (B)

Q18 (A)

Q19 (C)

Q20 (B)

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## Hints & Solutions

### Q1 Text Solution:

#### Calculation

Total Card in a Deck = 52 cards

Total Red Card in a Deck = 26 cards

Prime numbers are 2,3,5,7

$$\text{Probability} = \frac{\text{Number of favourable Outcome}}{\text{Total Possible Outcome}}$$

$$\Rightarrow P = \frac{4}{26} = \frac{2}{13}$$

Hence the correct Option is **Option A** i.e.,  $\frac{2}{13}$

### Q2 Text Solution:

#### Calculation

The sum of the terms of the given ratio is  $5+2=7$ .

Hence, 28 liters of mixture contain  $\frac{5}{7}$  parts of milk and  $\frac{2}{7}$  parts of water.

Thus, Amount of milk in 28 liters is  $\frac{5}{7} \times 28 = 20$  liters.

The amount of water in 28 liters is

$$\frac{2}{7} \times 28 = 8 \text{ litres.}$$

If 2 liters of water is added, the amount of water becomes  $8+2=10$  liters.

$$\Rightarrow \frac{\text{Milk}}{\text{water}} = \frac{20}{10} = \frac{2}{1}$$

The new ratio of milk and water is 2: 1.

### Q3 Text Solution:

It is given that SP of a piece = ₹50

Also 10% pieces get rejected.

So, SP of 90% product, i.e., 3600 pieces =  $3600 \times 50 = ₹1,80,000$

Under such a situation, the company makes 25% profit.

Hence, the total outlay =  $\frac{100}{125} \times 180000 = ₹1,44,000$

Now, the condition when 50% of the equipment are rejected:

Revenue = 2000 pieces  $\times 50 = ₹1,00,000$

Hence, the loss when 50% of the products are rejected

$$= 144000 - 100000 = ₹ 44,000$$

Hence, option B is the correct answer.

### Q4 Text Solution:

#### Calculation

$$\text{Area of circle} = \pi r^2$$

Now the diagonal of a square = 14 cm

$$\text{radius of the circle} = \frac{\text{Diagonal of a square}}{2} = \frac{14}{2}$$

Radius = 7 cm

$$\text{Area of circle} = \frac{22}{7} \times 7 \times 7 = 154 \text{ cm}^2$$

Hence the correct Option is **Option D** i.e.,  $154 \text{ cm}^2$

### Q5 Text Solution:

#### Calculation

The correct option is B 150 g

Quantity of bad-quality wheat

$$= \frac{10}{100} \times 150 = 15 \text{ g}$$

Amount of wheat required to get a mixture of 5%

$$\text{bad quality wheat} = \frac{15}{5} \times 100 = 300 \text{ g}$$

Amount of wheat that should be added = 150g

Hence the correct **Option A** i.e., 150g

### Q6 Text Solution:

#### Calculation

Suppose the daily wages of a man, a woman and a boy are \$4 k, 3 k\$ and \$2 k\$ respectively.

$$\therefore 15 \times 4k + 18 \times 3k + 12 \times 2k = 2070$$

$$\Rightarrow 60k + 54k + 24k = 2070$$

$$\Rightarrow 138k = 2070$$

$$\Rightarrow k = 15$$

Daily wages of a man, a woman and a boy are Rs60, Rs45 and Rs30 respectively,

Daily wages of 1 man +2 women +3 boys

$$= \text{Rs } 60 + 2 \times \text{Rs } 45 + 3 \times \text{Rs } 30 = \text{Rs } 60 + \text{Rs } 90 + \text{Rs } 90 = \text{Rs } 240$$

Hence the correct Option is **Option A** i.e., Rs 240

### Q7 Text Solution:

#### Calculation

Distance between the starting point and ending

$$\text{point} = \text{total time} \times \frac{\text{Product of two speeds}}{\text{Sum of two speeds}}$$

Total time = 10 hours

Two speeds are 30 km /h, 20 km /h

Distance between starting point and ending

$$\text{point} = 10 \times \left\{ \frac{(20 \times 30)}{(20+30)} \right\} \text{ km}$$

Distance between starting point and ending



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point = 120 km

So, the distance covered by him

$$= (120 \times 2) \text{ km} = 240 \text{ km}$$

Total distance covered by Anuj is 240 km.

Hence the correct Option is **Option B** i.e, 240 km

**Q8 Text Solution:**

Let the price of jeans is Rs x.

After one year of service, he will get 80 rupees and a pair of jeans.

But he served for only 9 months and receives a pair of jeans and an amount of Rs. 55.

The amount he will get in 12 months service is Rs (x+80).

The amount he will get in 1 months service is =Rs  $\frac{x+80}{12}$

The amount he will get in 9 months service is =Rs

$$\frac{x+80}{12} \times 9 = \frac{3}{4} (x + 80)$$

According to the question,

$$\frac{3}{4} (x + 80) = x + 55$$

$$3x + 240 = 4x + 220$$

$$x = 20$$

The price of jeans is Rs 20.

Hence, Option D is the correct answer.

**Q9 Text Solution:**

A candidate scores 25% and fails by 32 marks

Let the maximum marks be 100x.

Minimum required number to pass for 1st

$$\text{candidate} = 25\% \text{ of } 100x + 32$$

$$= 25x + 32$$

Another candidate who scores 40% marks, gets

28 marks more than the minimum required marks to pass the examination.

Minimum required number to pass for 2nd

candidate

$$= 40\% \text{ of } 100x - 28 = 40x - 28$$

A.T.Q.

$$25x + 32 = 40x - 28$$

$$15x = 60,$$

$$x = 4$$

$$\text{Maximum mark} = 100x = 400$$

Marks of candidate who score 72% marks

$$= 72\% \text{ of } 400 = 288$$

**Q10 Text Solution:**

**Calculation**

Let the speed of the stream x mph. Then, Speed downstream = (10 + x) mph.

Speed upstream = (10 - x) mph

$$\frac{36}{(10 - x)} - \frac{36}{(10 + x)} = \frac{90}{60}$$

$$\Rightarrow 72x \times 60 = 90 (100 - x^2)$$

$$\Rightarrow x^2 + 48x - 100 = 0$$

$$\Rightarrow (x + 50)(x - 2) = 0$$

$$\Rightarrow x = 2 \text{ mph}$$

Hence the correct Option is **Option A** i.e, 2 mph

**Q11 Text Solution:**

**Calculation**

$$\Rightarrow \frac{\frac{1}{3} + \frac{3}{4} + \left(\frac{2}{5} - \frac{1}{3}\right)}{1\frac{2}{3} \text{ of } \frac{3}{4} - \frac{1}{4} \text{ of } \frac{4}{5}}$$

$$\Rightarrow \frac{\frac{1}{3} + \frac{3}{4} + \frac{1}{15}}{1\frac{2}{3} \text{ of } \frac{3}{4} - \frac{1}{4} \text{ of } \frac{4}{5}}$$

$$\Rightarrow \frac{\frac{1}{3} + \frac{3}{4} + \frac{1}{15}}{\frac{5}{3} \times \frac{3}{4} - \frac{1}{4} \times \frac{4}{5}}$$

By solving the above equation

$$\Rightarrow \frac{69}{60} \times \frac{20}{21} = \frac{23}{21}$$

Hence the correct Option is **Option C** i.e,  $\frac{23}{21}$

**Q12 Text Solution:**

**Calculation**

Let's assume cost price = x

Selling price = Rs. 10

$$\text{Loss} = \frac{1}{11} \cdot x$$

$$\text{Cost Price} = \text{Selling Price} + \text{Loss}$$

$$x = 10 + \frac{x}{11}$$

Hence the correct Option is **Option C** i.e, 11

**Q13 Text Solution:**

**Calculation**

$$\text{A and B's 1 hour work} = \frac{1}{12} + \frac{1}{15} = \frac{3}{20}$$

$$\text{A and C's 1 hour work} = \frac{2}{15}$$



$$\text{Part filled in 2 hours} = \frac{3}{20} + \frac{2}{15} = \frac{17}{60}$$

$$\text{Part filled in 6 hours} = 3 \times \frac{17}{60} = \frac{17}{20}$$

$$\text{Remaining part} = 1 - \frac{17}{20} = \frac{3}{20}$$

Now, it's A and B's turn.

$$\text{Time taken by A and B to fill } \frac{3}{20} = 1 \text{ hour}$$

∴ Total time taken to fill the tank

$$= 6 + 1 = 7 \text{ hours}$$

Hence the correct Option is **Option B** i.e, 7 hrs

#### Q14 Text Solution:

##### Calculation

Let the ten's digit no. be  $x$  and one's digit no. be  $y$

.

So the no. will be  $= 10x + y$ .

Given :  $x + y = 9$  ---- (I)

$$9(10x + y) = 2(10y + x) \Rightarrow 88x - 11y = 0$$

----- (II)

On solving I and II simultaneously you will get

$$x = 1 \text{ and } y = 8.$$

Therefore your desired no. is 18

Hence the correct Option is **Option A** i.e, 18

#### Q15 Text Solution:

Given

A man spends 40% of his monthly on food and one third of the remaining on transport.

He saves Rs. 4500 per month, which is half money after spending on food and transport

Calculation

Suppose family income of man is Rs.  $X$

expenditure on food

$$\Rightarrow 40\% \text{ of } x = \frac{2x}{5}$$

Remaining amount

$$\Rightarrow x - \frac{2x}{5} = \frac{3x}{5}$$

Expenditure on transport

$$\Rightarrow \frac{1}{3} \times \frac{3x}{5} = \frac{x}{5}$$

Remaining amount

$$\Rightarrow \frac{3x}{5} - \frac{x}{5} = \frac{2x}{5}$$

As per the question

$$\frac{1}{2} \times \frac{2x}{5} = 4500$$

$$x = 4500 \times 5$$

$$x = \text{Rs. } 22500$$

#### Q16 Text Solution:

##### Calculation

Given,

$$P = \text{Rs } 16000, r = 20\% \text{ p. a.} = \frac{2}{4} = 5\% \text{ per quarter,}$$

$$\text{Time} = 9 \text{ months} = \frac{9}{12} \text{ years} = \frac{9}{12}$$

$$\times 4 \text{ quarters} = 3 \text{ quarters}$$

$$\text{Amount} = P \left( 1 + \frac{R}{100} \right)^N$$

$$\therefore A = 16000 \left( 1 + \frac{5}{100} \right)^3$$

$$= 16000 \times \left( \frac{21}{20} \right)^3$$

$$= 16000 \times \frac{21 \times 21 \times 21}{8000}$$

$$= \text{Rs. } 18522$$

$$\text{Therefore, C.I.} = \text{Rs. } 18522 - \text{Rs. } 16000 = \text{Rs. } 2522$$

#### Q17 Text Solution:

##### Calculation

Let the number of other workers be  $x$

Given that the number of agricultural workers is

11 times the other workers. Therefore, the

number of agricultural workers is  $11x$

Given that the average income of agricultural workers is  $S$

$$\text{Therefore, } S = \frac{\text{sum of incomes of agricultural workers}}{11x}$$

$$\Rightarrow \text{sum of incomes of agricultural workers} = 11 \times S$$

$$(1)$$

Given that the average income of other workers is  $T$

$$\text{Therefore, } T = \frac{\text{sum of incomes of other workers}}{x}$$

$$\text{sum of incomes of other workers} = xT \dots\dots\dots (2)$$

The average income of all the workers is

$$\frac{11xS + xT}{11x + x} = \frac{11S + T}{12}$$



**Q18 Text Solution:**

Let the rate of interest on the first money =  $x\%$   
per annum  
then,

$$\left(5000 \times \frac{x}{100} \times 4\right) = \left\{4000 \times \frac{(x+1)}{100} \times 4\right\}$$

$$\Leftrightarrow 5x = 4x + 4 \Leftrightarrow x = 4\% \text{ yearly}$$

**Q19 Text Solution:**

Ans. (c)

Assume that the side length of the square ground is  $L$  Km.

$\therefore$  Area of the square ground is  $L^2$  Square Km.

According to the question, the area of a square ground is  $576 \text{ km}^2$

$$\therefore L^2 = 576 \Rightarrow L = 24 \text{ km.}$$

The perimeter of the square ground is  $4L \text{ km.} = 4 \times 24 \text{ Km.} = 96 \text{ Km.}$  The speed of the dog is  $12 \text{ km/hr}$  Total distance to be travelled by the dog =  $96 \text{ km.}$

$$\therefore \text{Time required} = \frac{\text{distance to be travelled by the dog}}{\text{The speed of the dog}}$$

$$\Rightarrow 96/12 = 8 \text{ hour.}$$

$\therefore$  Time taken for dog to run around the ground =  $8 \text{ hr}$

**Q20 Text Solution:**

$$(A+B)\text{'s 1 day's work} = \frac{1}{30}$$

$$(A+B)\text{'s 20 days' work} = \frac{20}{30} = \frac{2}{3}$$

$$\text{Remaining work} = 1 - \frac{2}{3} = \frac{1}{3}$$

Now,  $\frac{1}{3}$  part of work is done by A in 20 days.

$\therefore$  Whole work will be done by A alone in  $20 \times 3$  i.e., 60 days.



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