

# AFCAT Memory Based Paper – 26 Aug 2022

- Q1** If  $P = ab^2$  and  $Q = a^2b$  where  $a$  and  $b$  are prime numbers then HCF & LCM of  $P$  and  $Q$  (respectively) are:  
 (A)  $ab, a^2b^2$   
 (B)  $1, a^2b^2$   
 (C)  $a\sqrt{b}, a^2b^2$   
 (D) None of the above
- Q2** At what time between 5 to 6 o'clock will the hands of a clock points coincide with each other?  
 (A) 20 min past to 5  
 (B)  $25\frac{3}{11}$  min past to 5  
 (C) 27 min past to 5  
 (D)  $27\frac{3}{11}$  min past to 5
- Q3** Two dice are thrown simultaneously. Find the probability of getting a sum of more than 7  
 (A)  $\frac{5}{12}$   
 (B)  $\frac{3}{12}$   
 (C)  $\frac{11}{36}$   
 (D) None of the above
- Q4** There are two bags. One contains 4 white & 5 Black balls, another contains 4 white & 3 black balls. If one ball is drawn from the first bag and kept in another bag unseen then the probability of choosing a black ball from the second bag is:  
 (A)  $\frac{15}{324}$   
 (B)  $\frac{25}{324}$   
 (C)  $\frac{4}{9}$   
 (D) None of the above
- Q5** The difference between simple interest and compound interest on a certain sum of money for 2 years at 10% per annum is ₹ 631. Find the sum  
 (A) Rs 63100  
 (B) Rs 47500  
 (C) Rs 53100  
 (D) Rs 65000
- Q6** A lends Rs. 4000 to B and a certain sum to C at the same time at 7% per annum simple interest. If after 5 years, A receives Rs. 3500 as interest from B and C. What is the difference between sums given to B and C by A?  
 (A) Rs 5000  
 (B) Rs 4000  
 (C) Rs 3500  
 (D) Rs 2000
- Q7** 10 years ago average age of 4 members of a family was 24 years. Two children were born and the current average of 6 members is 24 years. If the age difference in both children is 2 years then find the age of the younger child.  
 (A) 7 year  
 (B) 5 year  
 (C) 3 years  
 (D) 8 year
- Q8** There are two sections A and B of a class consisting of 40 and 44 students respectively. If the average weight of section A is 35 kg and that of section B is 37 kg, find the average weight of the whole class  
 (A) 36.04 Kg  
 (B) 37 kg  
 (C) 35.12 kg  
 (D) 38 kg
- Q9** Sugar A the cost of 9.25 Rs/kg is mixed with another sugar B in 17: 15. If the mixture is sold at 10 Rs/kg then find the cost of another sugar  
 (A) Rs 10.85/kg  
 (B) Rs 10/kg  
 (C) Rs 9.25/kg  
 (D) Rs 8/kg
- Q10** 27.44% of 0.433% (up to 6 decimal places) is  
 (A) 0.001188  
 (B) 0.001818  
 (C) 0.001415  
 (D) 0.005287
- Q11** Two trains P & Q travel towards each other at a speed of 50 km/hr and 40 km/hr respectively. By the time they meet, the first train has traveled 100 km more than the second. The distance between P and Q are:  
 (A) 900 km  
 (B) 1200Km  
 (C) 860 Km  
 (D) 800 km



**Q12** 5 men & 4 women can do a piece of work in 10 days, and 4 men & 7 women can do the same work in 8 days. Find the number of days taken by 11 women to do the same work

- (A)  $7\frac{67}{99}$   
(B)  $7\frac{22}{45}$

(C) 8 days

(D) None of the above

**Q13** A and B can do a piece of work in 16 days & 10 days. A started the work and after 4 days, B also joined him till the completion of the work. How many days will take to complete the entire work

- (A)  $8\frac{8}{13}$

- (B)  $7\frac{8}{13}$

(C) 9 days

(D) 8 days

**Q14** The selling price of an article is 96 Rs & cost price is numerically same as profit %. What is the cost price?

- (A) Rs 60

- (B) Rs 100

(C) Rs 120

(D) Rs 150

**Q15** An article is sold at Rs. 375 such that its profit on an article is one-fourth of the cost price. Find the cost price?

- (A) Rs 400

- (B) Rs 350

(C) Rs 300

(D) Rs 200

**Q16** A merchant has 1000 kg of sugar, part of which he sells at 8% profit and the rest at 18% profit. he gains 14% on the whole. The quantity sold at 18% profit is :

- (A) 600 kg

- (B) 500kg

(C) 400kg

(D) 800kg

**Q17** Two numbers are in the ratio of 3 : 5. If 9 is subtracted from each then they are in the ratio of 12 : 23. Find a smaller number

- (A) 49

- (B) 33

(C) 55

(D) 47

**Q18** Rs. 5625 is divided among A, B, and C so that A may receive  $\frac{1}{2}$  as much as B and C together receive and B receives  $\frac{1}{4}$  of what A and C

together receive. The share of A is more than that of B by

- (A) Rs 700

- (B) Rs 600

(C) Rs 550

(D) Rs 750

**Q19** The rectangular park with a length and breadth of 180 m & 120 m respectively, is maintained in a circular field. The area of the circular field excluding the park is 40000 metre square. Find the radius of the field

- (A) 140m

- (B) 80 m

(C) 50 m

(D) 110m

**Q20** The length and breadth of a rectangle are in the ratio 3: 2. If the length is increased by 5 m keeping the breadth the same, the new area of a rectangle is  $2600 m^2$ . What is the perimeter of the rectangle?

- (A) 200m

- (B) 100m

(C) 150m

(D) 175m



## Answer Key

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

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



## Hints & Solutions

### Q1 Text Solution:

#### Calculation

$$P = ab^2 \dots\dots\dots (1)$$

$$Q = a^2b \dots\dots\dots (2)$$

We know that HCF is the Highest Common Factor between two expressions

here, a and b are common factor so,

$$\text{HCF} = a \times b$$

LCM is Least Common Multiple i.e, taking the highest power of common multiple

$$\text{Here LCM} = a^2b^2$$

### Q2 Text Solution:

#### Calculation

Angle between the hour hand and minute hand,

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

Here H=5

When minute and hour hands coincide, then

$$\theta = 0$$

Putting the value of H and theta

$$\Rightarrow 0 = 30 \times 5 - \frac{11M}{2}$$

$$\Rightarrow 0 = 150 - \frac{11M}{2}$$

$$\Rightarrow 150 = \frac{11M}{2}$$

$$\Rightarrow M = \frac{300}{11} = 27\frac{3}{11}$$

### Q3 Text Solution:

#### Calculation

When the dice are rolled the possible outcome

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

Now by forming the pair, there will be 15 outcomes out of 36 as favourable outcomes

$$n(E) = 15$$

Using the formula

$$P(E) = \frac{n(E)}{n(S)} = \frac{15}{36} = \frac{5}{12}$$

### Q4 Text Solution:

#### Calculation

Here are 2 cases

Case-1 If the white ball is transferred from bag1 to 2

The probability of choosing a black ball from bag2

$$P(A) = P(\text{white ball transferred})$$

$$\times P(\text{Ball drawn Black})$$

$$\Rightarrow P(A) \times P\left(\frac{C}{A}\right) = \frac{4}{9} \times \frac{3}{8} = \frac{3}{18}$$

Case-2 If the black ball transferred from bag1 to 2 then

The probability of choosing a black ball from bag2

$$P(B) \times P\left(\frac{D}{B}\right) = \frac{5}{9} \times \frac{4}{8} = \frac{5}{18}$$

Required Probability

$$P = P(A) \times P\left(\frac{C}{A}\right) + P(B) \times P\left(\frac{D}{B}\right)$$

$$\Rightarrow \frac{3}{18} + \frac{5}{18} = \frac{8}{18} = \frac{4}{9}$$

### Q5 Text Solution:

#### Calculation

Here are the values given,

$$\Rightarrow CI - SI = 631, T = 2 \text{ years}$$

$$\Rightarrow \text{Rate} = 10\%$$

Putting the formula for CI and SI

$$\Rightarrow P\left(1 + \frac{r}{100}\right)^2 - \frac{P \times R \times T}{100} = 631$$

$$\Rightarrow P\left(1 + \frac{10}{100}\right)^2 - \frac{P \times 10 \times 2}{100} = 631$$

$$\Rightarrow P\left\{\left(\frac{11}{10}\right)^2 - \frac{1}{5}\right\} = 631$$

$$\Rightarrow P\left\{\left(\frac{121}{100}\right) - \frac{1}{5}\right\} = 631$$

Solving for P

$$\Rightarrow P = 63100$$

### Q6 Text Solution:

#### Given

Interest for 5 years = 3500

$$\text{then, for 1 year} = \frac{3500}{5} = 700$$

Here, A lends 4000 to B and let's say x sum to C, so Adding both Interests of B and C of 1 year

$$\text{Here, } SI = \frac{P \times R \times T}{100}$$

$$\Rightarrow \frac{4000 \times 7 \times 1}{100} + \frac{x \times 7 \times 1}{100} = 700$$

$$\Rightarrow \frac{4000 \times 7 + x \times 7}{100} = 700$$

$$\Rightarrow 28000 + 7x = 70000$$

$$\Rightarrow 7x = 42000$$

$$\Rightarrow x = 6000$$



Difference between C and B  
 $= 6000 - 4000 = 2000$

**Q7 Text Solution:****Calculation**

Present total age of 4 members

$$\Rightarrow 24 \times 4 = 96 + (10 \times 4) = 136$$

Present total age of 6 members (including 2 children)

$$\Rightarrow 24 \times 6 = 144$$

The sum of the ages of two children

$$\Rightarrow 144 - 136 = 8 \text{ years}$$

Since the age difference between children is 2 year

So the age of children would be 5 year and 3 year

**Q8 Text Solution:****Calculation**

We know Average =  $\frac{\text{Sum of Observations}}{\text{Number of Observations}}$

Here Total students in section A = 40

Here Total students in section B = 44

For total weight in section A  
 $= \text{total student} \times \text{Average weight} = 40 \times 35 = 1400 \text{ kg}$

For total weight in section B  
 $= \text{total student} \times \text{Average weight} = 44 \times 37 = 1628 \text{ kg}$

The total weight of both section  
 $= 1400 + 1628 = 3028$

Average of both section  
 $= \frac{3028}{40+44} = \frac{3028}{84} = 36.04$

**Q9 Text Solution:****Calculation**

Cost of sugar A = 9.25/kg

Cost of mixture = 10/Kg

Ratio = 17 : 15

Let the cost of sugar B by x/Kg

According to the question

$$\Rightarrow \frac{x-10}{0.75} = \frac{17}{15}$$

$$\Rightarrow 15x - 10 = 12.75$$

$$\Rightarrow x = 10.85/\text{kg}$$

**Q10 Text Solution:****Calculation**

$$27.44\% \text{ of } 0.433\%$$

$$\Rightarrow \left(\frac{27.44}{100}\right) \times \left(\frac{0.433}{100}\right)$$

$$\Rightarrow 0.001188$$

**Q11 Text Solution:****Calculation**

Let the distance covered by train Q be x

Since P and Q take the same time t

$$\Rightarrow T_p = T_q$$

$$\Rightarrow \frac{x+100}{50} = \frac{x}{40}$$

$$\Rightarrow 5x = 4x + 400$$

$$\Rightarrow x = 400$$

Hence initial distance b/w P and Q

$$= (x + 100) + x$$

$$\Rightarrow 400 + 100 + 400 = 900 \text{ km}$$

**Q12 Text Solution:****Formula used**

$$\frac{(M_1 \times D_1 \times H_1)}{W_1} = \frac{(M_2 \times D_2 \times H_2)}{W_2}$$

Let the efficiency of man be x and the efficiency of woman be y

$$\Rightarrow (5x + 4y) \times 10 = (4x + 7y) \times 8$$

$$\Rightarrow 50x + 40y = 32x + 56y$$

$$\Rightarrow 18x = 16y$$

$$\Rightarrow x = \frac{8}{9}y$$

Now, the work done in 1 day by 5 men and 4 women

$$\Rightarrow 5x + 4y = \frac{1}{10}$$

$$\Rightarrow 5\left(\frac{8}{9}y\right) + 4y = \frac{1}{10}$$

Again solving,

$$y = \frac{9}{760}$$

Hence, 11 woman work in 1 day

$$\Rightarrow 11 \times \frac{9}{760} = \frac{99}{760} = 7\frac{67}{99} \text{ days}$$

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

A can complete work in 16 days, B in 10 days

LCM of (16,10)=80

Total work = 80 unit

$$\text{Efficiency of A} = \frac{80}{16} = 5$$

$$\text{Efficiency of B} = \frac{80}{10} = 8$$

$$\text{Work by A in 4 days} = 5 \times 4 = 20 \text{ unit}$$

$$\text{Remaining work} = 80 - 20 = 60 \text{ unit}$$



Time to complete the remaining work  
 $= \frac{60}{(5+8)} = \frac{60}{13} \text{ days}$

Hence, total time to complete 80 unit of work

$$\Rightarrow \frac{60}{13} + 4 = \frac{60+52}{13} = \frac{112}{13} = 8 \frac{8}{13}$$

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

Selling price = Rs 96

Cost price is the same as the profit % so Let's say it is W

We know

$$\text{Profit}\% = \frac{(SP-CP)}{CP} \times 100$$

$$\Rightarrow W = \frac{(96-W)}{W} \times 100$$

$$\Rightarrow W^2 = (96 - W) \times 100$$

$$\Rightarrow W^2 + 100W - 9600 = 0$$

Solving the equation

$$\Rightarrow W = 60 \text{ or } -160$$

So the CP is Rs 60

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

Profit = SP - CP

Here profit =  $\frac{1}{4} \times CP$

$$\Rightarrow \frac{1}{4}CP = SP - CP$$

$$\Rightarrow CP\left(\frac{1}{4} + 1\right) = SP$$

$$\Rightarrow \frac{5}{4}CP = 375$$

$$CP = 300$$

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

Let the cost price of 1 kg of sugar = Rs100

SP of 1 kg at 8% profit

$$\Rightarrow 100 \times \frac{108}{100} = \text{Rs } 108$$

SP at 18% profit

$$100 \times \frac{118}{100} = \text{Rs } 118$$

The average selling price of 1 kg of sugar

$$\Rightarrow 100 \times \frac{114}{100} = \text{Rs } 114$$

Using the rule of Allegation

The ratio of sugar sold at 8% and 18% profit

$$\Rightarrow (118 - 114) : (114 - 108)$$

$$\Rightarrow 4 : 6 = 2 : 3$$

Quantity sold at 18% profit

$$= \frac{3}{5} \times 1000 = 600 \text{ Kg}$$

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

Let the number be 3x and 5x

$$\Rightarrow \frac{(3x-9)}{(5x-9)} = \frac{12}{23}$$

$$\Rightarrow 23(3x - 9) = 12(5x - 9)$$

$$\Rightarrow 69x - 207 = 60x - 108$$

$$\Rightarrow 9x = 99$$

$$\Rightarrow x = 11$$

So the numbers are 55 and 33

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

$$A + B + C = 5625$$

According to the question

$$A = \frac{B+C}{2}$$

$$\Rightarrow B + C = 2A$$

Adding A both side

$$\Rightarrow A + B + C = 3A = 5625$$

$$\Rightarrow 3A = 5625$$

$$\Rightarrow A = \text{Rs } 1875$$

$$\text{Again } B = \frac{A+C}{4}$$

Now applying same step as above for B

$$\Rightarrow A + B + C = 5B = 5625$$

$$\Rightarrow B = \text{Rs } 1125$$

Difference

$$= A - B = 1875 - 1125 = \text{Rs } 750$$

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

$$\text{Area of circle} - \text{Area of rectangle} = 40000$$

Using the formulas of Areas

$$\pi r^2 - (120 \times 180) = 40000$$

$$\Rightarrow \pi r^2 = 40000 + (120 \times 180)$$

$$\Rightarrow r^2 = \frac{7}{22} \times 61600 = 19600$$

$$\Rightarrow r = \sqrt{19600}$$

$$\Rightarrow r = 140$$

**Q20 Text Solution:****Calculation**

Let the length and breadth be 3y and 2 y respectively

Area of rectangle = 2600



$$\Rightarrow (3y + 5) \times 2y = 2600$$

$$\Rightarrow 6y^2 + 10y = 2600$$

$$\Rightarrow 6y^2 + 10y - 2600 = 0$$

By solving the equation

$$\Rightarrow y = 20$$

so the length and breadth would be

$$\Rightarrow 3y = 3 \times 20 = 60$$

$$\Rightarrow 2y = 2 \times 20 = 40$$

Hence

perimeter

$$= 2(L + B) = 2(60 + 40) = 200$$



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