

# AFCAT MBT 9 Aug Shift-2

## Numerical Aptitude

- Q1** If the square of the sum of two numbers is 90 and square of their difference of is 46, what is the product of the two numbers?  
(A) 11 (B) 22  
(C) 30 (D) 32
- Q2** At what rate of compound interest per annum will a sum of Rs. 1200 become Rs. 1348.32 in 2 years?  
(A) 5% (B) 6%  
(C) 7.8% (D) 8.5%
- Q3** Anushka makes a profit of 15% by selling an article, then what would be the profit percent, if it will be calculated on the selling price instead of cost price?  
(A) 21% (B) 20%  
(C) 25% (D) 13%
- Q4** A train covers a certain distance in 45 minutes. If its speed is reduced by 5 km/hr, it takes 3 minutes more to cover the same distance. The distance (in km) is:  
(A) 50 (B) 70  
(C) 60 (D) 80
- Q5** If  $a : b = 3 : 5$  and  $b : c = 7 : 8$ , then  $2a : 3b : 7c$  is equal to ?  
(A) 42 : 105 : 320 (B) 15 : 21 : 35  
(C) 6 : 15 : 40 (D) 30 : 21 : 350
- Q6** There are 4 semi-circular gardens on each side of a square-shaped pond with each side 21 m. The cost of fencing the entire plot at the rate of Rs 12.50 per meter is  
(A) Rs 1650 (B) Rs 1750  
(C) Rs 1800 (D) Rs 1900
- Q7** The average age of five persons is 28 yrs. If one of them is excluded the average decreases by 2 yrs. The age of the excluded person in yrs is:  
(A) 34 (B) 28  
(C) 35 (D) 36
- Q8** Two kinds of daal at Rs 18 and Rs 24.8 per kg are mixed. In what ratio should they be mixed such that by selling at Rs 30 per kg, a profit percentage of 50% is realized?  
(A) 12:5 (B) 12:7  
(C) 4:7 (D) 3:7
- Q9** A shopkeeper bought 80 kg of rice at a discount of 10% Besides 1 kg rice was offered free to him on the purchase of every 20 kg rice. If he sells the rice at the marked price, his profit percentage will be  
(A)  $16\frac{2}{3}\%$  (B) 15.25%  
(C)  $8\frac{1}{3}\%$  (D) 12%
- Q10** The compound Interest on Rs 8000 in 1 year at 4% per annum the interest being compounded half yearly is-  
(A) 752.45 (B) 632.65  
(C) 323.20 (D) 783.45
- Q11** Two equal amounts were borrowed at 5% and 4% simple interest. The total interest after 4 years amounted to 405. What was the total amount borrowed ?  
(A) Rs 1075 (B) Rs 1100  
(C) Rs 1125 (D) Rs 1150
- Q12** Find the Smallest 5-digit number divisible by 243?  
(A) 10345 (B) 11450  
(C) 10106 (D) 10206
- Q13** If the price of the cooking gas rises by 15%, by what percent should a family reduce its consumption so as not to exceed the budget on cooking gas?



## Defence

- (A)  $12\frac{1}{23}\%$   
 (B)  $13\frac{1}{23}\%$   
 (C)  $14\frac{1}{23}\%$   
 (D) None of these

- Q14** A is 50% more efficient as B. In one day, C can do half of the work done by A and B together. If C alone can do the work in 40 days, then A, B, and C together can do the work in how many days?  
 (A)  $\frac{44}{3}$  days (B)  $\frac{43}{3}$  days  
 (C)  $\frac{40}{3}$  days (D)  $\frac{50}{3}$  days

- Q15** A retailer purchases a machine at a discount of 10% and sells it for 5940 at a profit of 10%. The amount of discount received by the retailer from the wholesaler was  
 (A) 500 (B) 600  
 (C) 5500 (D) 650

- Q16** A sum of ₹ 8,400 is divided between Anuj and Brishesh such that Anuj's share at the end of 2 years is equal to Brijesh's share at the end of  $2\frac{2}{3}$  years at 15% p.a., interest compounded 8 - monthly. What is Anuj's share (in ₹) in the given sum?  
 (A) 4,400 (B) 4,700  
 (C) 5,600 (D) 6000

- Q17** In a bag, there are 12 Apples. Out of those 4 are rotten. If two Apples are taken out random from there, what is the probability to get exactly two rotten Apples?  
 (A)  $\frac{2}{15}$  (B)  $\frac{1}{11}$   
 (C)  $\frac{1}{15}$  (D)  $\frac{5}{12}$

- Q18** When the price of an item was reduced by 20%, its sales increased by x%. If there is an increase of 25% in the receipt of the revenue, then the value of x is :  
 (A) 56.25% (B) 53.84%  
 (C) 61.5% (D) 55.75%

- Q19** A can finish the work in 25 days while B can finish the work in 16 days. If A started the work

alone and B joined him after 5 days. Find out the total time taken to finish the work.

- (A) 10 days (B) 13 days  
 (C) 15 days (D) 17 days

- Q20** A cow is tied by a rope of 42 feet length... If it grazes 154 sq feet per day than how much days it will take to graze the area fully  
 (A) 7 Days (B) 3 Days  
 (C) 4 Days (D) 6 Days


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## Answer Key

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

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

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## Hints & Solutions

### Q1 Text Solution:

#### Calculation

The two numbers will be x and y

Here

$$(x + y)^2 = 90 \dots\dots\dots 1$$

$$(x - y)^2 = 46 \dots\dots\dots 2$$

Subtracting equation 1 and 2

$$\Rightarrow (x + y)^2 - (x - y)^2 = 4xy$$

putting the value

$$\Rightarrow 90 - 46 = 4xy$$

$$\Rightarrow 44 = 4xy$$

$$\Rightarrow 11 = xy$$

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

### Q2 Text Solution:

#### Calculation

Let the rate of interest be R

$$134832 = 1200 \left(1 + \frac{R}{100}\right)^2$$

$$\left(1 + \frac{R}{100}\right)^2 = \frac{1348.30}{1200}$$

$$\left(1 + \frac{R}{100}\right)^2 = \frac{11236}{10000}$$

$$\left(1 + \frac{R}{100}\right) = \frac{106}{100}$$

$$R = 6\%$$

### Q3 Text Solution:

#### Formula Used:

$$\text{Profit percent} = \frac{\text{Profit}}{\text{CP}} \times 100$$

But, here we use

$$\text{Profit percent} = \frac{\text{Profit}}{\text{SP}} \times 100$$

#### Calculation:

Let CP be 100

$$\text{Profit} = 15\%$$

$$\therefore \text{SP} = 115$$

profit on Selling price =

$$\frac{15}{115} \times 100 = 13.04\% \approx 13\%$$

Profit on Selling price = 13%.

### Q4 Text Solution:

#### Calculation:

Let the distance be Dkm

Speed

$$= \frac{\text{Distance}}{\text{time}} = \frac{D}{\left(\frac{45}{60}\right)} = \frac{60D}{45} = \frac{4D}{3} \text{ km/h}$$

The speed of train is reduced by 5km/h

New speed

$$= (4D/3) - 5 = (4D - 15)/3 \text{ km/h}$$

$$\text{New time} = 45 \text{ min} + 3 \text{ min} = 48 \text{ min}$$

$$48/60 \times (4D - 15)/3 = D$$

$$\Rightarrow 16(4D - 15) = 60D$$

$$\Rightarrow 4(4D - 15) = 15D$$

$$\Rightarrow 16D - 60 = 15D$$

$$\Rightarrow D = 60$$

### Q5 Text Solution:

#### Given:-

$$a : b = 3 : 5 \text{ and } b : c = 7 : 8$$

#### Calculation:-

$$\frac{a}{b} = \frac{3}{5}$$

$$a = \frac{3b}{5}$$

$$2a = \frac{6b}{5} \dots\dots (i)$$

$$\frac{b}{c} = \frac{7}{8}$$

$$c = \frac{8b}{7}$$

$$7c = 8b \dots\dots (ii)$$

Using eqn - i and ii in  $(2a : 3b : 7c)$

$$\Rightarrow \frac{6b}{5} : 3b : 8b$$

$$\Rightarrow 6 : 15 : 40$$

Hence, the correct answer is **Option (c)** i.e.,

$$6 : 15 : 40$$

### Q6 Text Solution:

#### Calculation

Length of the fence

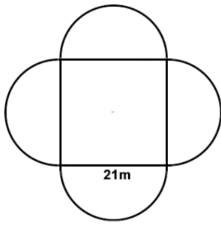
$$= 4\pi R \text{ Where, } R = \frac{21}{2} \text{ m}$$



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$$\Rightarrow 4\pi R$$

$$\Rightarrow 4 \times \frac{22}{7} \times \frac{21}{2} m$$

$$\Rightarrow 132m$$

Cost of fencing

$$\Rightarrow \text{Rs. } (132 \times \frac{25}{2})$$

$$\Rightarrow \text{Rs. } 1650$$

**Q7 Text Solution:**

Sum of ages of five persons =  $28 \times 5 = 140$   
 Sum of ages of four persons =  $26 \times 4 = 104$   
 The age of the excluded person =  $140 - 104 = 36$  years.  
 Hence, the correct answer is D.

**Q8 Text Solution:****Given:-**

Two kinds of daal at Rs 18 and Rs 24.8 per kg are mixed

**Formula Used:-**

$$\text{Ratio} = \frac{\text{Dearer Price} - \text{Mean}}{\text{Mean} - \text{Cheaper Price}}$$

$$CP = SP \times \frac{100}{100 + \text{Profit}\%}$$

**Calculations:-**

$$SP = 30$$

$$\text{Profit}\% = 50$$

$$CP = 30 \times \frac{100}{150} = 20$$

$$\text{Required Ratio} = \frac{24.8 - 20}{20 - 18} = \frac{12}{5}$$

The required ratio is 12:5

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

Let SP of 1 kg rice = Rs. 1

SP of 80 kg rice = Rs. 80

$$CP \text{ of } 80 \text{ kg rice} = 80 \times \frac{90}{100} = \text{Rs. } 72$$

$$\text{Rice got free on } 80 \text{ kg} = \frac{80}{20} = 4 \text{ kg}$$

$$\text{Total rice} = 80 + 4 = 84 \text{ kg}$$

$$\text{Total SP of total rice} = \text{Rs. } 84 \text{ kg}$$

$$\text{Profit} = 84 - 72 = \text{Rs. } 12$$

$$\text{Profit percentage} = \left[ \frac{12}{72} \right] \times 100 = 16\frac{2}{3}\%$$

**Q10 Text Solution:**

Principal = 8000

Rate = 4% per annum which is 2% per half-year

Time = 1 year = 2 half-years

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

$$A = 8000 \left( 1 + \frac{2}{100} \right)^2$$

$$A = 8000 \left( \frac{51}{50} \right)^2$$

$$A = 8323.20$$

$$\text{Interest} = A - P = 8323.20 - 8000 = 323.20$$

Hence, Option C is the correct answer.

**Q11 Text Solution:****Given:-**

From the given question

$$R_1 = 5\% \text{ and } R_2 = 4\%$$

**Formula Used:-**

$$\text{Simple Interest } (S.I.) = \frac{P \times R \times T}{100}$$

$P$  = Principle

$R$  = Rate

$T$  = Time

**Calculation:-**

Let the amount borrowed =  $p$

total interest after 4 years amounted to Rs. 405

From the given question

$$R_1 = 5\% \text{ and } R_2 = 4\%$$

$$405 = \frac{p \times 5 \times 4}{100} + \frac{p \times 4 \times 4}{100}$$

$$40500 = 36p$$

$$p = 1125$$

Hence, the correct answer is **Option (c)** i.e.,

$$\text{Rs. } 1125$$

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

smallest 5-digit number = 10000

On dividing 10000 by 243, we get

Remainder = 37

$$\text{So } 243 - 37 = 206$$

206 should be added to 10000 to get the smallest 5-digit

number divisible by 243.

$$\therefore 10000 + 206 = 10206$$


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**Q13 Text Solution:****Given:-**

Price of the cooking gas rises by 15%

**Formula used:-**

If price of a commodity is increased (or decreased) by  $x\%$ , then the

Decrease (or increase) in consumption, so as not to increase (or

decrease) the expenditure is  $(\frac{x}{100 \pm x} \times 100)\%$

**Calculation:-**

Let the initial price of cooking gas be Rs. 100

Price after increase = Rs. 115

On Rs. 115 he should reduce Rs. 15 on

Rs. 100, he should reduce

$$\Rightarrow \frac{15}{115} \times 100 = 13\frac{1}{23}\%$$

Hence, the correct answer is **Option (b)** i.e.,

$$13\frac{1}{23}\%$$

**Shortcut method:-**

Here  $x = 15\%$

Reduction in consumption =  $(\frac{x}{100+x} \times 100)\%$

$$= \frac{15}{115} \times 100\% = 13\frac{1}{23}\%$$

**Q14 Text Solution:****Given:**

A=50% more efficient than B

$C = \frac{1}{2}$  of work done by A and B together

C alone can do the work in =40 days

**Calculation:**

(A's one day's work) : (B's one day's work)

$$\Rightarrow 150 : 100$$

$$\Rightarrow 3 : 2$$

Let A's one day's work be  $3x$  and B's one day's work be  $2x$ .

According to the question

$$C's \text{ one day's work} = \frac{(3x+2x)}{2}$$

$$\Rightarrow 5x/2 = 1/40$$

$$\Rightarrow x = (1/40) \times 2/5$$

$$\Rightarrow x = 1/100$$

A's one day's work be  $3/100$  and B's one day's

work be  $1/50$ .

$\therefore (A + B + C)$ 's one day's work:

$$\Rightarrow 3/100 + 1/50 + 1/40$$

$$\Rightarrow 15/200$$

$$\Rightarrow 3/40 = (A + B + C) \text{'s one day work}$$

A, B, C can complete the whole work in  $40/3$  days.

**Q15 Text Solution:**

Let the marked price of the machine be ` 100

S.P after a discount of 10% =  $(100 - 10) \%$  of 100 = `90

$$S.P \text{ after gain } 10\% = \frac{92 \times 110}{100} = 99$$

If `99 is the S.P the marked

$$\text{Price} = \frac{100}{99} \times 5940 = 6000$$

Amount of discount received by the retailer =

10% of 6000

$$= \frac{6000 \times 10}{100} = 600$$

**Q16 Text Solution:****Given:**

A sum of Rs8,400 is divided between Anuj and Brishesh such that Anuj's share at the end of 2 years is equal to Brishesh's share at the end of (2)years 8 months At 15% p.a., interest compounded for 8 months.

**Concept used:**

$$\text{Amount} = \text{Principal} \left( 1 + \frac{\text{Rate of interest}}{100} \right)$$

**Calculation:**

$$\text{Interest rate for 8 monthly} = (15/12) \times 8$$

$$\Rightarrow 10\%$$

Let one part Anuj be  $x$ , so other part

$$\text{brihesh} = 8400 - x$$

As per the question,



$$\begin{aligned}
 x(1 + 10/100)^3 &= (8400 - x)(1 + 10/100)^4 \\
 \Rightarrow x &= (8400 - x) \times 11/10 \\
 \Rightarrow x &= 400 \times 11 \\
 \Rightarrow x &= \text{Rs } 4400
 \end{aligned}$$

Anuj's share in the given sum is Rs 4400

**Q17 Text Solution:**

**Calculation:**

There are 12 Apples overall and 2 Apples taken randomly

$$\begin{aligned}
 \text{Total number of events} &= {}^{12}C_2 \\
 &\Rightarrow (12!)/(2! \times 10!) \\
 &\Rightarrow 6 \times 11 \\
 &\Rightarrow 66
 \end{aligned}$$

We have to take 2 rotten Apples out of 4 rotten Apples

In  ${}^4C_2$  we can choose that

$$\begin{aligned}
 {}^4C_2 &= (4!)/(2! \times 2!) \\
 &\Rightarrow (4 \times 3)/2 \\
 &\Rightarrow 6
 \end{aligned}$$

$$\begin{aligned}
 \text{Probability of getting exactly two rotten Apples} \\
 &= \frac{6}{66} = \frac{1}{11}
 \end{aligned}$$

**Q18 Text Solution:**

We know that: Revenue = price  $\times$  sales

Let the original price per item be 100.

and the number of items sold be 100.

Then, original revenue =  $100 \times 100 = 10000$ .

New price =  $(100 - 20) \% \text{ of } 100 = 80$

New revenue =  $(100 + 25)\% \text{ of } 10000 = 12500$

New number of items sold =  $\frac{12500}{80} = 156.25$

Percentage increase in the number of items sold

$$= \frac{156.25 - 100}{100} \times 100 = 56.25 \%$$

Hence, the value of  $x = 56.25$

**Q19 Text Solution:**

**Given:**  $A$  can finish the work in 25 days while  $B$  can finish the work in 16 days.

**Calculation:**

$A$  can finish the work in 25 days.

So, In one day  $A$  can do  $\left(\frac{100}{25}\right) \% = 4\%$  of the work.

$\therefore$  In 5 days, working alone he can finish

$5 \times 4 = 20\%$  of the work.

Now,  $B$  joins  $A$ .

$B$  can finish the work in 10 days.

So, In one day he can finish  $\left(\frac{100}{16}\right) \% = 6.25\%$  of the work.

Now, Remaining work =  $100 - 20 = 80\%$

$A$  and  $B$  together can do

$= (4\% + 6.25\%) = 10.25\%$

Hence, time taken =  $\left(\frac{80}{10.25}\right) = 7.8 \approx 8$  days (approx).

So, total time taken =  $5 + 8 = 13$  days.

Hence, the correct answer is **option (b)** i.e., 13 days.

**Q20 Text Solution:**

**Calculation**

Area of field =  $\pi r^2$

$$\Rightarrow \frac{22}{7} \times 42 \times 42 = 616 \text{ ft}^2$$

$$\text{Number of days required} = \frac{616}{154} = 4 \text{ days}$$





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