

AFCAT MBT 10 Aug Shift-2 2024

Numerical Aptitude

- Q1** At what time between 7 O'clock and 8 O'clock, will the hands of a clock be in the same straight line but not together?
 (A) $6\frac{6}{11}$ min past 7
 (B) $5\frac{7}{12}$ min past 6
 (C) $5\frac{5}{11}$ min past 7
 (D) None of these
- Q2** Anni purchased a book with 36% discount on the labeled price. He sold it with 50% profit on the price he bought. What was his percent loss on the labeled price?
 (A) 4% (B) 6%
 (C) 8% (D) 2%
- Q3** Ravi is twice as likely to win a match than Kishan. Find the probability of Kishan winning at least 1 match if they compete in three matches.
 (A) $\frac{8}{27}$ (B) $\frac{17}{27}$
 (C) $\frac{19}{27}$ (D) $\frac{11}{27}$
- Q4** Pipes A and C can fill a tank in 60 hours and 36 hours, respectively, while pipe B can empty it in 90 hours. In an empty tank, A and C are open for 12 hours then B and C are open for 5 hours. If 276 liters of the tank is empty, what is the total capacity (in liters) of the tank?
 (A) 960 (B) 840
 (C) 480 (D) 720
- Q5** Men, women and children are employed to do a work in the proportion of 3 : 2 : 1 and their wages as 5 : 3 : 2. When 90 men are employed, total daily wages of all amounts Rs. 10350. Find the daily wages of one man.
 (A) Rs. 45 (B) Rs. 57.5
 (C) 115 (D) 75
- Q6** A number when divided by the sum of 555 and 445 gives two times their difference as quotient and 30 as the remainder. The number is
 (A) 220030 (B) 22030
 (C) 1220 (D) 1250
- Q7** Find the value of: $\frac{(0.6667)(0.8333)}{(0.1667)(0.2500)} \times \frac{(0.6666)}{(0.5555)}$
 (A) 16 (B) 18
 (C) 20 (D) 22
- Q8** Three athletes run a 4 km race. Their speeds are in the ratio 16 : 15 : 11. When the winner wins the race, then the distance between the athlete in the second position to the athlete in the third position is ?
 (A) 1000 m (B) 800 m
 (C) 750 m (D) 600 m
- Q9** By increasing the speed of his car by 15 km/hour, a person covers 300 km distance by taking an hour less than before. The original speed of the car was ?
 (A) 45 km/hour
 (B) 50 km/hour
 (C) 60 km/hour
 (D) 75 km/hour
- Q10** A 250 m long train running at a speed of 100 km/h crosses another train coming from the opposite direction at a speed of 62 km/h in 10 seconds. What is the length of the second train?
 (A) 240 m (B) 200 m
 (C) 230 m (D) 270 m
- Q11** If 170% of a number added to 66, then the result becomes equal to twice of the number. What is the number?
 (A) 200 (B) 220
 (C) 210 (D) 236
- Q12** The ratio of two numbers is 5:8. What is the 25% of the second value if 60% of the first number is 12?
 (A) 8 (B) 10



- (C) 15 (D) 17
- Q13** The rectangular park with a length and breadth of 180 m and 120 m respectively is maintained in a circular field. The area of the circular field excluding the park is 40000 m^2 . Find the radius of the field.
- (A) 160 m (B) 140 m
(C) 130 m (D) 140 m
- Q14** The price of milk increases by 20%. Due to this, a person was able to buy 2 litres less for Rs 240. What was the price initially per litre?
- (A) Rs 20 (B) Rs 18
(C) Rs 19 (D) Rs 22
- Q15** The speed of boat a down the stream is 125% of the speed in still water. If the boat takes 30 minutes to cover 20 km in still water, then how much time (in hours) will it take to cover 15km upstream?
- (A) $\frac{3}{4}$
(B) $\frac{1}{2}$
(C) $\frac{1}{4}$
(D) 1
- Q16** A sum of Rs 2500 becomes Rs 8100 in 2 years at a certain rate of compound interest. What will be the sum (in Rs) after 4 years?
- (A) 29824 (B) 36284
(C) 41624 (D) 26244
- Q17** If Raju earns 20% more than Vijay, then what percentage of income earned by Vijay is less than the income earned by Raju ?
- (A) 25%
(B) $(\frac{50}{3})\%$
(C) $(\frac{40}{3})\%$
(D) $(\frac{20}{3})\%$
- Q18** The average of 11 observations is 10 , that of the first 6 being 9 and that of the last 6 being 11 . What is the 6th observation?
- (A) 11 (B) 8
(C) 9 (D) 10

- Q19** A working with 30 % of his efficiency is as efficient as B working with 25% of his efficiency which is as efficient as C working with 40% of his efficiency. If A and B together can complete a work in 7.5 days, then find the time taken by C to complete the same work alone?
- (A) 22 (B) 25
(C) 30 (D) 45
- Q20** An amount of ₹10,000 becomes ₹12,100 in 2 years at a certain interest rate compounded annually. Find the amount after 4 years.
- (A) 14341 (B) 16461
(C) 13431 (D) 14641



Answer Key

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

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



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Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

Given that, $n = 7$, $(n + 1) = 8$, also $n > 6$

According to the question,

The hands will be in the same straight line at $(5n - 30) \times \frac{12}{11}$ min past n .

\Rightarrow at $(5 \times 7 - 30) \times \frac{12}{11}$ min past 7

\Rightarrow at $(35 \times 30) \times \frac{12}{11}$ min past 7

\therefore at $5\frac{5}{11}$ min past 7

Hence, option (c) is correct.

Q2 Text Solution:

Calculation

Let the labeled price of the book = Rs. 1000

Cost price of Anand = $1000 \times \frac{(100-36)}{100}$ = Rs. 640

Selling price of books = $640 \times \frac{(100+50)}{100}$ = Rs. 960

Loss% on labeled price = $\frac{1000-960}{1000} \times 100\% = 4\%$

Q3 Text Solution:

Given:

- Probability of Kishan winning a match

$$P(K) = \frac{1}{3}$$

- Probability of Kishan losing a match $P(L) = \frac{2}{3}$

The probability of Kishan losing all 3 matches is:

$$\left(\frac{2}{3}\right)^3 = \frac{8}{27}$$

So, the probability of Kishan winning at least 1 match is:

$$1 - \frac{8}{27} = \frac{19}{27}$$

Q4 Text Solution:

Topic - Time and Work

Let the tank capacity be 180p

Dividing the capacity of the tank by the time taken, we have,

Efficiency of A = 3p

Similarly Efficiency of B = -2p (negative work)

Similarly Efficiency of C = 5p

$$\text{Tank filled} = (A + C) \times 12 + (B + C) \times 5 = (3p + 5p) \times 12 + (5p - 2p) \times 5 = 111p$$

$$\text{Remaining tank capacity} = 180p - 111p = 69p$$

$$69p = 276$$

$$p = 4$$

$$\text{Total tank capacity} = 180p = 180 \times 4 = 720 \text{ liters}$$

Hence, option d is the correct answer.

Q5 Text Solution:

Given:

- Men, women, and children employed in the ratio 3:2:1.

- Wages in the ratio 5:3:2.

- 90 men are employed, and total daily wages are Rs. 10,350.

Let the number of men, women, and children be $3x$, $2x$, and x respectively. Since 90 men are employed:

$$3x = 90 \implies x = 30$$

So, there are 60 women and 30 children.

Total wages:

$$90 \times 5y + 60 \times 3y + 30 \times 2y = 10350$$

$$450y + 180y + 60y = 690y = 10350$$

$$y = \frac{10350}{690} = 15$$

Daily wage of one man:

$$5y = 5 \times 15 = 75$$

Thus, the daily wage of one man is Rs. 75.

Q6 Text Solution:

$$\text{Divisor} = 555 + 445 = 1000$$

$$\text{Quotient} = 2(555 - 445) = 220$$

$$\text{Remainder} = 30$$



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$$\begin{aligned} \text{Dividend} &= \text{Number} = \text{Divisor} \times \\ &\text{Quotient} + \text{Remainder} \\ &= 1000 \times 220 + 30 = 220030 \end{aligned}$$

Q7 Text Solution:**Calculation:-**

We have, $\frac{(0.6667)(0.8333)}{(0.1667)(0.2500)} \times \frac{(0.6666)}{(0.5555)}$

Which can be written as,

$$\frac{\left(\frac{2}{3}\right) \times \left(\frac{5}{6}\right)}{\left(\frac{1}{6}\right) \times \frac{2500}{10000}} \times \frac{6666}{5555}$$

$$\Rightarrow \left(\frac{2}{3}\right) \times \left(\frac{5}{6}\right) \times 6 \times \frac{1}{4} \times \frac{6}{5}$$

$$\Rightarrow 2 \times 4 \times 2$$

$$\Rightarrow 16$$

Hence, the correct answer is **option (a)** i.e., 16

Q8 Text Solution:**Given:-**

Ratio of speed are 16 : 15 : 11

Formula used:-

$$\text{Distance} = \text{Speed} \times \text{Time}$$

Calculation:-

Let speed of winner athlete be $16x \text{ km/h}$

Similarly, speed of athletic in second and third position be $15x$ and $11x$, respectively

Total distance travelled by winner is 4 km

Therefore,

$$\text{Time} = \frac{4}{16x} h$$

Distance travelled by second athlete in

$$\frac{4}{16x} h = \frac{4}{16x} \times 15x = \frac{15}{4} \text{ km}$$

Similarly, distance travelled by third athlete in

$$\frac{4}{16x} h = \frac{4}{16x} \times 11x = \frac{11}{4} \text{ km}$$

Therefore, Difference between their distances

$$= \left(\frac{15}{4} - \frac{11}{4}\right) \text{ km} = 1 \text{ km} = 1000 \text{ m}$$

Hence, the correct answer is **Option (a)** i.e., 1000 m

Q9 Text Solution:**Given:-**

Increase in speed = 15 km/hour

Distance covered = 300 km

Time taken is one hour less

Formula used:-

$$\text{Distance} = \frac{(S_1 \times S_2)}{(S_2 - S_1)} \times \text{Time difference}$$

Calculation:-

Let the original speed the car be $x \text{ km/hour}$

Increased speed = $x + 15 \text{ km/hour}$

According to the question

$$300 = \frac{x(x+15)}{(x+15-x)} \times 1$$

$$300 = \frac{x^2+15x}{15}$$

$$300 \times 15 = x^2 + 15x$$

$$x^2 + 15x - 4500 = 0$$

$$x^2 + 75x - 60x - 4500 = 0$$

$$x(x+75) - 60(x+75) = 0$$

$$(x+75)(x-60) = 0$$

$x = -75$ and $x = 60$ since the speed cannot be negative therefore $x = 60 \text{ km/hour}$

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

60 km/hour

Q10 Text Solution:**Given:-**

The length of the first train = 250 m

The speed of the first long train = 100 km/h

The speed of the second long train = 62 km/h

The required time of the second train = 10 sec

Formula used:-

$$\text{Distance} = \text{Speed} \times \text{Time}$$

Calculation:-

Let the length of the second train coming from opposite = $x \text{ m}$.

So the total distance travelled = $(250 + x) \text{ m}$

Relative speed = $(100 + 62) \text{ km/h}$

$$= 162 \times \frac{5}{18} \text{ m/s}$$

$$= 45 \text{ m/s}$$

$$\text{Required time} = \frac{250+x}{45} = 10$$

$$\Rightarrow 250 + x = 450$$

$$\Rightarrow x = 450 - 250$$

$$\Rightarrow x = 200 \text{ m}$$

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

200 m

Q11 Text Solution:**Given:-**

170% of a number added to 66, the result becomes equal twice

Formula used:-

To determine the percentage, we have to divide the value by the total value and then multiply the resultant by 100

$$\text{Percentage} = \frac{\text{value}}{\text{Total value}} \times 100$$

Calculation:-

Let the number be x

According to the question,

$$\Rightarrow x \times \frac{170}{100} + 66 = 2x$$

$$\Rightarrow \frac{17x}{10} + 66 = 2x$$

$$\Rightarrow 2x - \frac{17x}{10} = 66$$

$$\Rightarrow \frac{3x}{10} = 66$$

$$\Rightarrow x = 220$$

Hence, the correct answer is **Option (b)** i.e., 220

Q12 Text Solution:

Given,

Ratio of two numbers 5:8

60% of the first value = 12

Let the first number be $5x$ and the second number be $8x$.

According to question,

60% of $5x = 12$

$$\Rightarrow \frac{60}{100} \times 5x = 12$$

$$\Rightarrow \frac{3}{5} \times 5x = 12$$

$$\Rightarrow x = 12 \times \frac{5}{3 \times 5}$$

$$\Rightarrow x = 4$$

Thus,

First number = $5x = 5 \times 4 = 20$

Second number = $8x = 8 \times 4 = 32$

Now,

25% of 32 is given by

$$= \frac{25}{100} \times 32$$

$$= \frac{1}{4} \times 32$$

$$= 8$$

Therefore, the 25% of the second value is 8.

Q13 Text Solution:

Given:-

Length of rectangle = 180 m

Breadth of rectangle = 120 m

Area between circle and rectangle = 40000 m²

Formula used:-

Area of rectangle = Length \times Breadth

Area of circle = πr^2

Calculation:-

According to the question,

Area of the circle — Area of rectangle = 40000

Using the above formula

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

$$\Rightarrow \frac{22}{7} r^2 = 40000 + 21600 = 61600$$

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

$$\Rightarrow r^2 = (140)^2$$

$$\Rightarrow r = 140$$

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

140 m

Video Solution:



Q14 Text Solution:

Given:-

Increase in Price = 20%

Concept Used:-

Expenditure = Price \times Consumption

When Expenditure is Constant, Price is inversely proportional to Consumption.

When we convert a % into a fraction, the denominator is regarded as the initial value and the numerator is the effect.

Calculation:-

20% can be written as $\frac{20}{100} = \frac{1}{5}$. So, 5 units is the initial price and 1 is the increase in the price.

So the Final price of milk will become 6 units.

As Price is inversely proportional to consumption, it can be tabulated as

	Initial	Final
Price	5	6
Consumption	6	5



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Exp endi ture	30	30
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From the table, we have a difference of 1 *units* consumption = 2 *litres* in the question.

Therefore, we can say that

Initial Consumption = $2 \times 6 = 12 \text{ litres}$ and

Final Consumption = $2 \times 5 = 10 \text{ litres}$

Also, the expenditure is Rs 240 given in the question, therefore, Price per litre

$$= \frac{240}{12} = \text{Rs } 20 \text{ per litre}$$

Hence, the correct answer is **Option (a)** i.e., Rs 20

Q15 Text Solution:

The boat takes 30 minutes to cover 20 km in still water.

Speed of the boat in still water

$$= \frac{20 \text{ km}}{30 \text{ min}} = \frac{20 \times 60}{30} \text{ km/hr} = 40 \text{ km/hr}$$

Speed of the boat in downstream

$$= 125\% \times 40 = 50 \text{ km/hr}$$

Speed of the stream

$$= 50 - 40 = 10 \text{ km/hr}$$

Speed of the boat in upstream

$$= 40 - 10 = 30 \text{ km/hr}$$

Required time to cover 15 km in upstream is

$$= \frac{15}{30} = \frac{1}{2} \text{ hr}$$

Hence, the correct answer is (B).

Q16 Text Solution:

Calculation

A sum of Rs 2500 becomes Rs 8100 in 2 years at a certain rate of compound interest.

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

$$8100 = 2500 \left(1 + \frac{R}{100}\right)^2$$

$$\frac{8100}{2500} = \left(1 + \frac{R}{100}\right)^2$$

$$\left(\frac{9}{5}\right)^2 = \left(1 + \frac{R}{100}\right)^2$$

$$\frac{9}{5} = 1 + \frac{R}{100}$$

$$\frac{9}{5} - 1 = \frac{R}{100}$$

$$R = 80\%$$

The Sum after 4 years

$$\begin{aligned} A &= 2500 \left(1 + \frac{80}{100}\right)^4 \\ &= 2500 \times \frac{18}{10} \times \frac{18}{10} \times \frac{18}{10} \times \frac{18}{10} \\ &= 26,244 \end{aligned}$$

Q17 Text Solution:

Given:-

Raju earns 20% more than Vijay

Calculation:-

Let the income of Vijay be $100x$

So, the income of Raju

$$= \left[\left(\frac{20}{100}\right) \times 100x\right] + 100x = 120x$$

Now, required percentage

$$= \left[\frac{(120x - 100x)}{100x}\right] \times 100$$

$$\Rightarrow \left(\frac{50}{3}\right)\%$$

Hence, the correct answer is **Option (b)** i.e., $\left(\frac{50}{3}\right)\%$

Q18 Text Solution:

Sum of 11 observations = mean \times 11 = $10 \times 11 = 110$

Sum of first 6 observations = Mean \times 6 = $9 \times 6 = 54$

Sum of last 6 observations = Mean \times 6 = $11 \times 6 = 66$

Value of 6th observation = $(54 + 66) - 110 = 120 - 110 = 10$

Hence, Option D is the correct answer.

Q19 Text Solution:

30% of A = 25% of B = 40% of C

$$\frac{3}{10}A = \frac{B}{4} = \frac{2}{5}C$$

$$A:B:C (\text{efficiency}) = \frac{10}{3} : 4 : \frac{5}{2} = 20 : 24 : 15$$

Total work =

$$(20 + 24) \times 7.5 = 44 \times 7.5 \text{ unit}$$

$$\text{Number of days taken by C} = \frac{44 \times 7.5}{15} = 22 \text{ days}$$

Hence, Option A is the correct answer.

Q20 Text Solution:

Calculation

Required Formula:

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

where, A = amount, P = principle and r = rate of interest
Solution:



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Here $A = 12100$

$P = 10,000$

$n = 2$ yrs

$$\therefore 12100 = 10000 \times \left(1 + \frac{r}{100}\right)^2$$

$$\text{or, } \left(1 + \frac{r}{100}\right)^2 = \frac{12100}{10000} = \left(\frac{11}{10}\right)^2$$

$$\text{or, } 1 + \frac{r}{100} = \frac{11}{10} \text{ or, } \frac{r}{100} = \frac{1}{10} \text{ or, } r = 10\%$$

After 4 years the amount will be

$$= 10000 \times \left(1 + \frac{10}{100}\right)^4$$

$$= 10000 \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10}$$

$$= 14641$$

The amount after 4 years is 14641 rupees.



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