FORENSIC MINDSET

CUET UG Quantitative Aptitude Practice Test with Answers PDF

Number of questions: 30 **Time Allowed: 30 mins.**

1. How many natural numbers between 200 and 400 are there which are divisible by 4, 5, 8 or 10?
   (a) 79 (b) 80
   (c) 81 (d) None of these
2. In an examination, 80% marks are required to get scholarship. Abhi got 1,005 and failed to get the scholarship by 13% of the maximum marks. What was the maximum marks?
   (a) 800 (b) 1,000
   (c) 1,500 (d) 1,800
3. Cost of 3 balls is equal to the cost of 2 pads, cost of 3 pads is equal to the cost of 2 gloves. Cost of 3 gloves is equal to the cost of 2 bats. If the cost of bat is Rs. 54, what is the cost of the ball?
   (a) Rs. 12 (b) Rs. 14
   (c) Rs. 16 (d) Rs. 18
4. Fifteen men can harvest a field in 28 days. How long will it take to harvest this field if the number of men is reduced to 10?
   (a) 40 days (b) 36 days
   (c) 38 days (d) 42 days
5. A cistern can be filled by a supply pipe in 30 min and emptied by a waste pipe in $\frac{4}{5}$ hr. If both pipes are opened together, in what time will the cistern be filled?
   (a) $\frac{1}{2}$ hr (b) 1 hr
   (c) $1\frac{1}{3}$ hr (d) 2 hr
6. A cone has a height h and base radius r. The volume of the cone is bisected by a plane parallel to the base which is at a distance of k from the base. Then k is
   (a) $\frac{1}{2}h$ (b) $\left(\frac{1}{2}\right)^{\frac{1}{2}}h$
   (c) $\left(\frac{1}{2}\right)^{\frac{1}{3}}h$ (d) None of these
7. If f(x, y) = 2x – y, the value of f(1, 1) + f $\left(\frac{1}{4},\frac{3}{4}\right)$ – f$\left(\frac{1}{2},\frac{1}{4}\right)$ is
   (a) $\frac{1}{2}$ (b) $\frac{1}{3}$
   (c) 0 (d) $\frac{1}{5}$
8. If two dice are thrown simultaneously, then what is the probability of getting the same number on both dice?
   (a) $\frac{1}{12}$ (b) $\frac{1}{2}$
   (c) $\frac{1}{6}$ (d) $\frac{1}{36}$
9. In a class of 200 students 70 play cricket, 60 play hockey and 80 play football. 30 play cricket and football, 30 play hockey and football, 40 play cricket and hockey. If 130 people play at least one game, find the number of people who play all the three games.
   (a) 30 (b) 20
   (c) 10 (d) None of these
10. Vijay and Shivku start simultaneously from the opposite ends of a pool which is 50 m long. They pass each other, reach the respective ends and immediately turn back. Now they meet at a distance of 15 m from where Vijay started 10 s after the start. Find the speed of Shivku.
    (a) 6.5 m/sec
    (b) 7.5 m/sec
    (c) 8.5 m/sec
    (d) 5 m/sec
11. Two numbers x and y are such that when divided by 6, they leave remainders 4 and 5 respectively. Find the remainder when $x^2 + y^2$ is divided by 6.
    (a) 3
    (b) 4
    (c) 5
    (d) None of these

12. Which of the following statements is true?
    (a) All the angles of a parallelogram can be acute.
    (b) If the diagonals of a quadrilateral are at right angles, it is a rhombus.
    (c) If the diagonals of a quadrilateral are at right angles, the figure formed by joining the mid-points of adjacent sides is a rectangle.
    (d) If one pair of opposite sides is parallel and the other pair of opposite sides is equal in a quadrilateral, then the quadrilateral is a parallelogram.

13. If $x^y + y^x = 17$ and $x + y = 5$, then $x - y$ $(x, y > 0)$ is
    (a) 1 (b) –1
    (c) 1 or –1 (d) None of these

14. How many odd integers from 1000 to 8000 (inclusive) have distinct digits?
    (a) 2520 (b) 1736
    (c) 1680 (d) 1920

15. In an apartment block there are 10 residents. The number of cars owned by the residents are 15. Four of the residents do not have any car, exactly 3 have one car each and one person has 4 cars. What may be the maximum number of cars owned by any resident?
    (a) 6 (b) 7
    (c) 8 (d) 5

16. There has been an increase in selling price of a car. If the increase is 20% of its final selling price, what is the increase as a percentage of original selling price?
    (a) 30% (b) 25%
    (c) 20% (d) None of these

17. Jane and Jill move towards each other from two towns that are 55 miles apart. Jane's speed is 12 miles per hr and Jill's speed is 10 miles per hr. After how much time will they be 11 miles apart?
    (a) 1 hr (b) 2 hr
    (c) 4 hr (d) 6 hr

18. Two horses were sold for Rs. 12,000 each, one at a loss of 20% and the other at a gain of 20%. The entire transaction resulted in
    (a) no loss no gain (b) loss of Rs. 1,000
    (c) gain of Rs. 1,000 (d) None of these

19. What is the value of k if A (4, k) is the mid-point of (2, 3) and (6, 7)?
    (a) 4 (b) 5
    (c) 6 (d) 7

20. In how many ways can you select two odd numbers and two even numbers out of the first 128 whole numbers?
    (a) ${}^{64}C_2 \times {}^{64}C_2$ (b) ${}^{64}C_2 \times {}^{63}C_2$
    (c) ${}^{63}C_2 \times {}^{63}C_2$ (d) None of these

21. Two containers contain equal quantities of milk and water respectively. Half the contents of the first is poured in the second and then the same quantity is transferred back into the first container. This is done three times. What is the ratio of milk to water in the two containers at the end of the process?
    (a) 5 : 2, 2 : 5 (b) 5 : 4, 4 : 5
    (c) 14 : 13, 13 : 14 (d) None of these

22. A leak in the bottom of a tank can empty it in 6 hr. A pipe fills the tank at 4 litre per minutes. When the tank is full, the inlet is opened, but due to the leak the tank is emptied in 8 hr. What is the capacity of the tank?
    (a) 5,260 L (b) 5,760 L
    (c) 5,846 L (d) 6,970 L

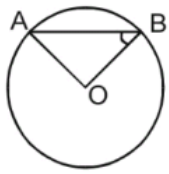
23. A boat goes 14 km upsteram in 56 minutes. The speed of stream is 2 km/hr. The speed of boat in still water is
    (a) 6 km/hr (b) 15 km/hr
    (c) 14 km/hr (d) 17 km/hr

24. Chords AB, BC and CD subtend angles of 80°, 60° and 70° respectively at the centre O of a circle. Then the acute angle between AC and BD is
    (a) 60° (b) 75°
    (c) 65° (d) 80°

25. A cone circumscribes a sphere and its height is double the diameter of the sphere. The volume of the cone is K times the volume of the sphere. Then K is equal to
    (a) 3 (b) 4
    (c) 2 (d) 6

26. Find two consecutive even numbers such that 73 times their difference is equal to their sum.
    (a) 72, 74 (b) 50, 52
    (c) 46, 48 (d) 36, 38

27. The average marks obtained by 22 candidates in an examination is 50. The average of the first 10 candidates is 44, while that of the last eleven is 60. The marks obtained by the 11th candidate is
    (a) 50
    (b) 56
    (c) 0
    (d) 59
28. Karan sold his cycle at a profit of 20%. Had he bought it for 20% less and sold it for Rs. 20 less, he would have gained 25%. The cost price of cycle is.
    (a) Rs. 100/-
    (b) Rs. 125/-
    (c) Rs. 120/-
    (d) Rs. 80/-
29. Two isosceles triangles have equal angles and their areas are in ratio 25 : 49. Then the ratio of their corresponding heights is
    (a) 25 : 49 (b) 3 : 5
    (c) 5 : 7 (d) 7 : 9
30. In the given circle, OA = 4 cm and ∠AOB = 112°. What is ∠ABO?



    (a) 22° (b) 34°
    (c) 44° (d) 45°

Answer Key

1. (a)	**2.** (c)	**3.** (c)	**4.** (d)	**5.** (c)	**6.** (d)	**7.** (c)	**8.** (c)	**9.** (b)	**10.** (a)
11. (c)	**12.** (c)	**13.** (c)	**14.** (b)	**15.** (a)	**16.** (b)	**17.** (b)	**18.** (b)	**19.** (b)	**20.** (b)
21. (c)	**22.** (b)	**23.** (d)	**24.** (b)	**25.** (c)	**26.** (a)	**27.** (c)	**28.** (a)	**29.** (c)	**30.** (b)

Explanations

1. a Here we just need to check that how many numbers are there between 200 and 400 that are divisible by 4 or 5, because that will take care of all the numbers in the range that are divisible by 8 or 10.

   Number of numbers divisible by 4 in the given range = 49.

   Number of numbers divisible by 5 in the given range = 39.

   Number of numbers divisible by both 4 and 5 in the given range = 9.

   ∴ The required number of numbers = 49 + 39 – 9 = 79.

2. c Required marks = 80%; Obtained marks = 1005; Failed by 13%

   ∴ 1005 = (80 – 13)% of maximum marks = 67%;

   Total marks = 1005 × 100/67 = 1500

3. c Cost of 1 glove = Cost of $\frac{2}{3}$ bat

   Cost of 1 pad = Cost of $\frac{2}{3}\times\frac{2}{3}$ bat

   Cost of 1 ball = Cost of $\frac{2}{3}\times\frac{2}{3}\times\frac{2}{3}$ bat

   Hence, cost of 1 ball = $\frac{2}{3}\times\frac{2}{3}\times\frac{2}{3}\times 54 = \text{Rs. } 16$.

4. d This is inverse variation

   ∴ Ratio of men × work = constant

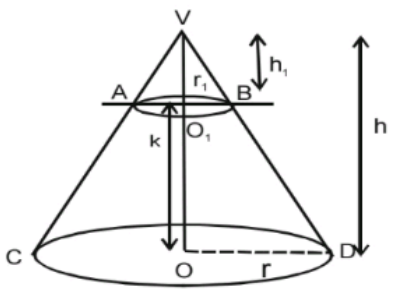
   Hence, 15 × 28 = 10 × x

   ∴ X = $\frac{15\times 28}{10}$ = 42 days

5. c Time required to fill the cistern = $\frac{1}{2-\frac{5}{4}}=\frac{1}{\frac{3}{4}}$

   $=\frac{4}{3}\text{ hr}=1\frac{1}{3}\text{ hr}$

6. d



   Let the radius of the cone VCD be r and the vertical height be h.

   Volume of the cone = $\frac{1}{3}\pi r^2 h$

   Let the radius of the cone VAB be r_1 and the vertical height be h_1.

   Its volume = $\frac{1}{3}\pi r_1^2 h_1$ ∴ $\frac{1}{2}\left(\frac{1}{3}\pi r^2 h\right)=\frac{1}{3}\pi r_1^2 h_1$

   $\therefore h_1=\frac{1}{2}\left(\frac{r}{r_1}\right)^2 h.$

   ΔVO_1B and VOD are similar.

   $\therefore \frac{O_1B}{OD}=\frac{VO_1}{VO}$, i.e. $\frac{r_1}{r}=\frac{h_1}{h}$

   Hence, $h_1=\frac{1}{2}\left(\frac{h}{h_1}\right)^2 h$, i.e. $h_1=\left(\frac{1}{2}\right)^{1/3} h$

   Hence, $k=h-\left(\frac{1}{2}\right)^{\frac{1}{3}} h = h\left(1-\frac{1}{2^{1/3}}\right)$.

7. c Given that f(x, y) = 2x – y

   So, $f(1,1)+f\left(\frac{1}{4},\frac{3}{4}\right)-f\left(\frac{1}{2},\frac{1}{4}\right)$

   $=[2(1)-1]+\left[2\times\frac{1}{4}-\frac{3}{4}\right]-\left[2\times\frac{1}{2}-\frac{1}{4}\right]$

   $=1-\frac{1}{4}-\frac{3}{4}=0$

8. c Total number of cases = 6 × 6 = 36

   Number of cases when we get same number on both the dice = (1, 1), (2, 2), (3, 3), (4, 4), (5, 5) and (6, 6)

   = 6 ways

   Required probability = $\frac{6}{36}=\frac{1}{6}$.

9. b $n(A\cup B\cup C)=n(A)+n(B)+n(C)-n(A\cap B)$

   $-n(B\cap C)-n(C\cap A)+n(A\cap B\cap C)$

   130 = 70 + 60 + 80 – 30 – 30 – 40 + x

   ⇒ x = 20

10. a It is obvious that Shivku travels 50 + 15 = 65 m in 10 s

    ⇒ His speed is 6.5 m/s.

11. c Suppose $x = 6k_1 + 4$ and $y = 6k_2 + 5$

    $x^2 + y^2 = (6k_1 + 4)^2 + (6k_2 + 5)^2$

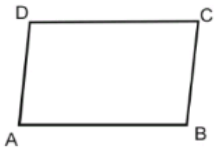
    $= 36k_1^2 + 48k_1 + 16 + 36k_2^2 + 60k_2 + 25$

    $= 36k_1^2 + 48k_1 + 36k_2^2 + 60k_2 + 41$

    Obviously, when this is divided by 6 the remainder will be 5.

12. c (a) If one angle is acute, the other angle is obtuse.

    So, all the angles cannot be acute.

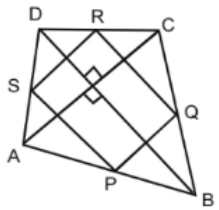


ABCD is a parallelogram.

$\angle A + \angle B = 180°$

(b) The diagonals should bisect each other at right angles, then only the quadrilateral is a rhombus.

(c)



P is the mid-point of AB and Q is the mid-point of BC.

$\therefore PQ = \frac{1}{2}AC$ and PQ is parallel to AC.

Similarly, $SR = \frac{1}{2}AC$ and is parallel to AC.

$\therefore$ PQ = SR and PQ is parallel to SR.

$\therefore$ PQRS is a parallelogram.

RQ is parallel to BD.

$\therefore \angle SRQ = 90°$

$\therefore$ PQRS is a rectangle.

(d) An isosceles trapezium would also satisfy this condition as shown below:

13. c Using choices, we have

(a) Let $x - y = 1$ ... (i)

$x + y = 5$ (given) ... (ii)

Adding (i) and (ii), we get

$2x = 6 \Rightarrow x = 3$ and $y = 2$

Now substituting the values of x, y in $x^y + y^x = 17$, we get

for $x = 3, y = 2, 3^2 + 2^3 = 17$

(b) Let $x - y = -1$ ... (i)

$x + y = 5$ (given) ... (ii)

Adding (i) and (ii), we get

$2x = 4 \Rightarrow x = 2$ and $y = 3$.

Now substituting the values of x, y in $x^y + y^x = 17$, we get

for $x = 2, y = 3, 2^3 + 3^2 = 17$

14. b Unit's place can be filled with any of the five digits 1, 3, 5, 7 or 9. When it is filled with 9, thousand's place can be filled in 7 ways (anything from 1 to 7) and remaining two places can be filled in $7 \times 8 = 56$ ways. So number of such numbers $= 56 \times 7 = 392$.

When unit's place is filled with any of the four digits 1, 3, 5 or 7, the thousand's place can be filled in $7 - 1 = 6$ ways and remaining two can be filled in $8 \times 7 = 56$ ways.

Number of such numbers $= 56 \times 6 \times 4 = 1344$.

$\therefore$ Total number of required numbers

$= 1344 + 392 = 1736$

15. a Four of the residents do not have any car, so 15 cars are owned by remaining 6 residents. One has 4 cars and exactly three have one car each, it means remaining 8 cars are owned by two people. Out of these two, one can own at least two and in that case the other will own 6 cars.

16. b Suppose, the final selling price is Rs. 100.

$\therefore$ The increase is Rs. 20 $\Rightarrow$ Original SP = Rs. 80.

$\therefore$ Increase is 25% of original SP.

17. b Distance covered in 1 hr = 12 + 10 = 22 miles.

(Since they are moving in opposite directions)

In 2 hr, they will cover = $22 \times 2 = 44$

Difference = $55 - 44 = 11$ miles

After 2 hr, they will be 11 miles apart

18. b Total selling price = Rs. 24,000 and in this type of transaction there is always loss.

Therefore, loss percentage = $\left(\frac{20}{100}\right)^2 = 4\%$

Now total cost price = $\frac{24000 \times 100}{96} = \text{Rs. } 25{,}000$

Loss = $25000 - 24000 = \text{Rs. } 1{,}000$

19. b Using mid-point formula

$x = \frac{x_1 + x_2}{2}$ and $y = \frac{y_1 + y_2}{2}$

$\therefore y_1 = 3, y_2 = 7$

$\therefore y = \frac{y_1 + y_2}{2} = \frac{3 + 7}{2} = 5$.

20. b First 128 whole numbers are 0, 1, 2, ..., 126, 127. So, there are 64 odd numbers and 63 even numbers.

$\therefore$ Required number of ways is ${}^{64}C_2 \times {}^{63}C_2$.

21. c Start with a litre of milk in first container and a litre of water in second and proceed.

Consider two container I and II where we will consider the ratio of milk in these two containers

I(M)	II(M)
1	0
$\frac{1}{2}$	$\frac{1}{2}$
$\frac{2}{3}$	$\frac{1}{3}$
$\frac{1}{3}$	$\frac{2}{3}$
$\frac{5}{9}$	$\frac{4}{9}$
$\frac{5}{18}$	$\frac{13}{18}$
$\frac{14}{27}$	$\frac{13}{27}$

Thus, the ratio of milk and water in the two container is 14 : 13, 13 : 14.

22. b Fully filled tank is emptied in 6 hr when inlet is closed but when inlet is opened, it is emptied in 8 hr.

$\Rightarrow$ Total water poured by inlet pipe

$= 4 \times 8 \times 60 = 1920$ L

Emptied by leak in 2 hr = 960 litres per hour

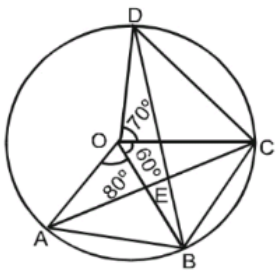
Capacity of the tank = $960 \times 6 = 5760$ L

23. d Let the speed of the boat in still water be x km/hr

While going upstream

$14 = (x - 2)\ \frac{56}{60} \Rightarrow x = 17$ km/hr

24. b

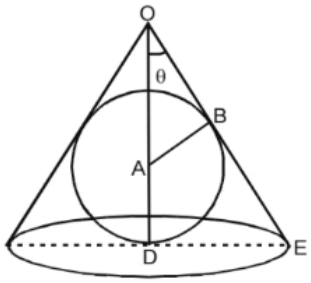


$\angle ACB = \frac{1}{2}\angle AOB = \frac{1}{2}(80^\circ) = 40^\circ$

$\angle DBC = \frac{1}{2}\angle DOC = \frac{1}{2}(70^\circ) = 35^\circ$

$\therefore \angle AEB = \angle ECB + \angle EBC = 40^\circ + 35^\circ = 75^\circ$

25. c



Here OD = 4r

$\therefore$ AO = 2r + r = 3r

Thus, $OB = \sqrt{(3r)^2 - r^2} = \sqrt{8}r.$

Now, $\frac{AB}{OB} = \frac{DE}{OD}$

$\Rightarrow DE = OD \times \frac{AB}{OB} = \frac{(4r) \times r}{\sqrt{8}r} = \frac{2r}{\sqrt{2}}$

Hence, the volume of the cone

$= \frac{1}{3} \times \pi \times \left(\frac{2r}{\sqrt{2}}\right)^2 \times (4r) = \pi r^3 \left(\frac{8}{3}\right)$

Volume of the sphere = $\frac{4}{3}\pi r^3$. Hence, K = 2.

26. a Let the two consecutive even numbers be x and x + 2

$\therefore x + x + 2 = 73\ (x + 2 - x)$

$\therefore 2x + 2 = 146$

$\therefore 2x = 144$

$\therefore x = 72$

$\therefore$ The numbers are 72 and 74.

27. c Total marks obtained by 11th candidate

$= 22 \times 50 - 10 \times 44 - 11 \times 60 = 0$

28. a Let the cost price of the cycle = Rs. x.

In the 2nd case cost price = 0.8x.

Selling price $= 1.2x - 20$.

Profit $= 0.25(0.8x)$.

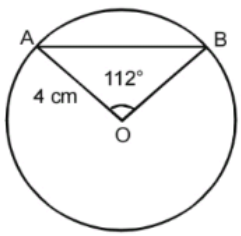
Hence, $0.8x(1 + 0.25) = 1.2x - 20.$

$\Rightarrow 1.25 \times 0.8x = 1.2x - 20. \Rightarrow x = \frac{20}{0.2} = \text{Rs. } 100$

29. c $\frac{h_1}{h_2} = \sqrt{\frac{25}{49}} = \frac{5}{7}$

$\therefore h_1 : h_2 = 5 : 7$

30. b



OA = OB (Radii of a circle)

$\therefore \angle BAO = \angle ABO$ (The angles opposite to equal sides are equal)

$\angle AOB + \angle ABO + \angle BAO = 180^0$

$\Rightarrow 2\angle ABO = 180^\circ - 112^\circ$

$\Rightarrow \angle ABO = \frac{68^\circ}{2} = 34^\circ$

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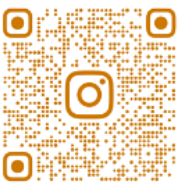

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