

**Examrace**

## CAT Model Paper 11 Questions and Answers with Explanation Part 2

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8. Natural numbers are written on a blackboard. The following operation is then repeated until we will get only one number: In each repetition, any two numbers say  $a$  and  $b$ , currently on the blackboard are erased and a new number  $a + b$  is written. But one number was missed by mistake. The sum obtained was 1525. Which number was missed?

(A) 15

(B) 25

(C) 20

(D) 10

Answer: A

Solution:

$$\frac{n(n+1)}{2} = 1525; n(n+1) = 3050; n = 55 \text{ (approx.)}$$

$$\frac{55 \times 56}{2} = 1540; \text{ Missed number} = 1540 - 1525 = 15$$

9. What is the remainder when

$(1)^7 + (71)^{77} + (771)^{777} + (7771)^{7777} + (777771)^{77777}$  is divided by 50?

(A) 46

(B) 6

(C) 56

(D) 5

Answer:

Solution:

To find the remainder when an expression is divided by 50, we need to find the last two digits of that numbers.

Last two digit of the given expression are  $1 + 91 + 91 + 91 + 91 + 91 = 456$

$$\frac{456}{50} = 6$$

10. A positive whole number  $M$  less than 100 is represented in base 2 notation, base 3 notation, and base 5 notation. It is found that in all three cases the last digit is 1, while in exactly two out of the three cases the leading digit is 1. Then  $M$  equals

(A) 31

(B) 63

(C) 75

(D) 91

Answer: D

Solution:

Option (D) - Since, the last digit in base 2, 3 and 5 is 1, the number should be such that on dividing by either 2, 3 or 5 we should get a remainder 1. The smallest such number is 31. The next set of numbers are 61, 91.

Among these only 31 and 91 are parts of the answer choices.

Among these,  $(31)_{10} = (11111)_2 = (1011)_3$ . thus, all three forms have leading digit 1.

Hence, the answer is 91.

11. At a new index of 12 shares, the shares of HBL, Niposys and Brilliance have a weightage of 7%, 13% and 1% respectively. What is the increase in the price of the other shares, if the rise in these three is 9%, 10% and 4%, when the index rises by 6%?

(A) 4%

(B) 3.4%

(C) 6%

(D) None of these

Answer: D

Solution:

Option D

Let's say the value of the index = 100

HBL = 7

Niposys = 13

$$\text{Brilliance} = 1$$

$$\text{Others} = 100 - 21 = 79$$

$$\text{Increased index value} = 106$$

Increased individual values

$$\text{HBL} = 1.09 \times 7 = 7.63$$

$$\text{Niposys} = 1.1 \times 13 = 14.3$$

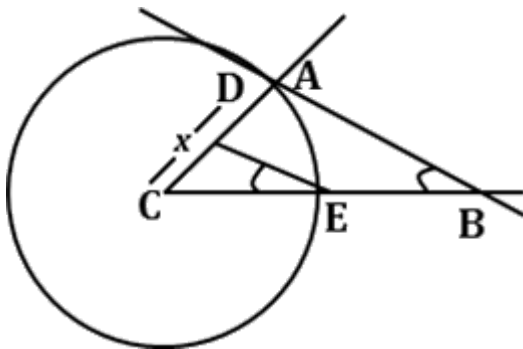
$$\text{Brilliance} = 1.04 \times 1 = 1.04$$

$$\text{Total} = 22.97$$

$$\text{Others} = 106 - 22.97 = 83.03$$

$$\text{Increase} = \frac{83.03 - 79}{79} \times 100 = 5.1\% \text{ (approx)}$$

12.  $\triangle ABC$  has a circle centered on vertex  $C$  that passes through points  $A$  and  $E$ . If  $\angle ABC \approx \angle DEC$ ,  $AC = 1$  and  $CD = x$ , what is the distance between  $E$  and  $B$ ?



- (A)  $2x$   
 (B)  $\frac{1-x}{x}$   
 (C)  $1+x$   
 (D)  $1-x$

Answer: B

Solution:

Since,  $\angle DEC \approx \angle ABC$ , it follows that  $\triangle DEC \approx \triangle ABC$ ,

$$\text{So, } \frac{1}{x} = \frac{BE+1}{1} \Rightarrow x(BE+1) = 1 \Rightarrow (BE+1) = \frac{1}{x} \Rightarrow BE = \frac{1-x}{x}$$

13. The number of positive integer  $n$  in the range  $12 < n < 40$  such that the product  $(n-1)(n-2)\dots\dots 3.2.1$  is not divisible by  $n$  is

- (A) 5  
 (B) 7  
 (C) 13  
 (D) 14

Answer: B

Solution:

The question is asking you for all prime numbers between 12 and 40. There are 7 prime numbers.

14. A mixture of 125 liters of milk and water contains 20% water. What amount of water needs to be added to this milk-water mixture in order to increase the percentage of water to 25% of the new mixture?

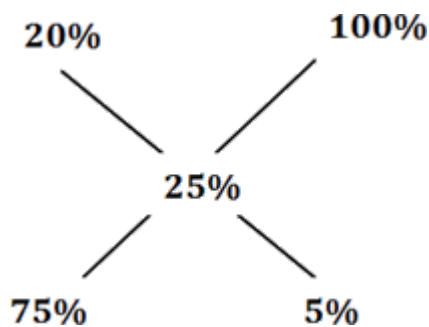
- (A) 7 L  
 (B) 5.66 L  
 (C) 8.33 L  
 (D) None of these

Answer: C

Solution:

We need to find out how much of solution of 100% water needs to be added to a solution containing 20% water to attain dilution of 25%.

This can be found out as follows.



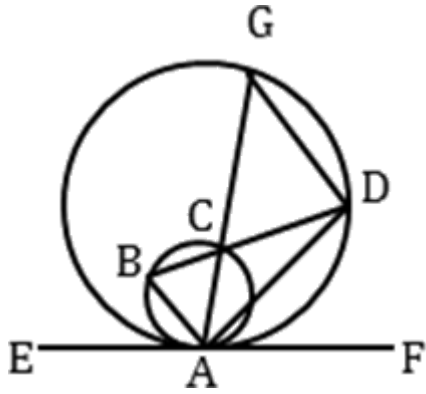
$$\text{Ratio} = 75 : 5 = 15 : 1$$

This is for 15 parts of a 20% water solution, one part of 100% water solution needs to be added.

Therefore, for a solution of 125 liters,  $\frac{125}{15} = 8.33 \text{ litres}$  of water needs to be added.

15. In the figure, EAF is a common tangent to the circles at the point A. Chords AC and BC of the smaller circles are produced to meet the larger circle at G and D respectively. Which of the

following must be true?



1.  $\angle ADG = \angle EAG$  2.  $\angle ABD = \angle AGD$  3.  $\angle BAE = \angle ADB$

- (A) 1 only  
 (B) 2 only  
 (C) 1 and 3 only  
 (D) 2 and 3 only

Answer: A

Solution:

Option: a

From the tangent. Secant theorem,  $\angle ADG = \angle EAG$ . Other equalities don't hold.

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