1. Suppose that you buy a rare stamp for Rs. 1000, sell it for Rs. 1500, buy it back for Rs. 2000, and finally sell it for Rs. 2500. How much money did you make or lose in buying and selling this stamp?

(A) Rs. 500 (B) Rs. 1000 (C) Rs. 1500 (D) Rs. 2000 (E) Rs. 2500

2. $\frac{3}{5}$ of Grade 6A and $\frac{3}{4}$ of Grade 6B are girls. If both classes have the same number of girls which of the following could be the number of students in Grade 6A?

(A) 40 (B) 42 (C) 44 (D) 46 (E) 48

3. What is the maximum number of equilateral triangles that can be made by arranging six sticks of equal length end-to-end?

(A) 2 (B) 3 (C) 4 (D) 5 (E) 6

4. Malani gave Seetha and Geetha as much money as each had. Then Seetha gave Malani and Geetha as much money as each had. Then Geetha gave Seetha and Malani as much money as each had. Then each of the three people had Rs. 40. How much money did Malani have at the beginning?

(A) 20 (B) 25 (C) 35 (D) 50 (E) 65

5. Consider the following statements by Abdul, Mina, and Kamala about a 4 digit number. Only one of these statements is false and others are true.

Abdul: It contains even numbers.
Mina: It does not contain even numbers.
Kamala: It contains 7.

Which of the following could be this number?

(A) 2244 (B) 3355 (C) 3366 (D) 3377 (E) 4444

26. n positive integers are written on a black board such that the difference between any two numbers is not divisible by n. Each turn two numbers are taken and they are replaced by the sum of those two numbers. This is carried out until there is only one number left.

I. If n is odd the remaining number is divisible by n.
II. If n is even we get a remainder of $\frac{n}{2}$ when remaining number is divided by n.
III. There exists an n for which the number left is less than $\frac{n(n+1)}{2}$.

(A) I only (B) I and II only (C) II and III only (D) All (E) I and III only

27. Rusiru and Pankaja were given two papers with two numbers written on them. They do not know each other's numbers, but were told that they are consecutive positive integers. The following conversation took place between them:

Rusiru: I am unable to determine your number.
Pankaja: I am also unable to determine your number.
Rusiru: Then I can tell yours.

Then Pankaja's number is

(A) 2 only (B) 4 only (C) 3 only (D) 3 or 4 only (E) 2 or 3 only

28. Let A be the set of all n, such that $n = d_1^2 + d_2^2 + d_3^2 + d_4^2$, where $1 = d_1 < d_2 < d_3 < d_4$ are the smallest 4 factors of n. For example $130 \in A$. Which of the following are true regarding A.

I. If $n \in A$ then n is even.
II. There exists $n \in A$, that are divisible by 4.
III. The only $n \in A$ that is divisible by 5 is 130.

(A) I only (B) II only (C) I and II only (D) I and III only (E) All

29. Let $S = \frac{4\times1}{1^4+4} + \frac{4\times2}{2^4+4} + \cdots + \frac{4\times2014}{2014^4+4} + \frac{4\times2015}{2015^4+4}$. Which of the following statements are true about S?

I. S is less than $\frac{3}{2}$.
II. S is greater than $\frac{3}{2} - \frac{2}{2016^2+1}$.
III. $S = \frac{3}{2} - \frac{2}{2016^2+1}$.

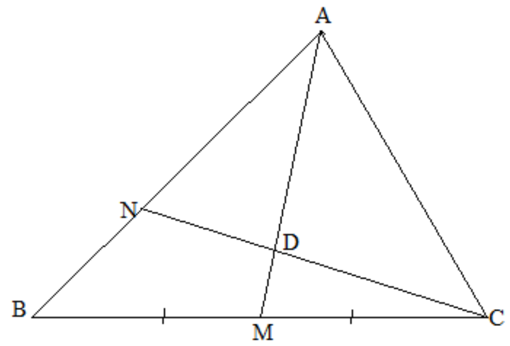
(A) I only (B) II only (C) I and II only (D) None (E) All

30. Consider a list of 12 distinct integers. Which of the following statements are true,

I. There exists at least one pair of numbers such that their sum is divisible by 11.
II. There is at least a pair of numbers such that their difference is divisible by 11.
III. There exists a subset, of those set of numbers such that the sum of the numbers in that subset is divisible by 11.

(A) I only (B) I and III only (C) II and III only (D) All (E) None

21. In the triangle ABC, M is the midpoint of the side BC and N is a point on the side AB with and $AN: NB = 2:1$. If D is the intersection point of the lines AM and CN the value of $AD: DM$ is



(A) 3 (D) 9

(B) 2 (E) $\frac{3}{2}$

(C) 4

22. Melanka and Kanchana are playing a game. Both are given as many pebbles as required. A bowl is placed in front of the players and they take turns adding 1, 2, or 3 pebbles to the bowl. The player who adds the 21st pebble to the bowl wins. Suppose Melanka starts the game. Which of the following statements is true?

(A) Melanka can always win (B) Kanchana can always win (C) None of them can win (D) Melanka can always win at his third turn. (E) Kanchana can always win at his third turn.

23. Supun has 20 identical marbles. In how many different ways he can put all 20 marbles in 4 different boxes? (He may choose to keep one or more boxes empty)

(A) $\frac{23\times22\times21}{3\times2\times1}$ (B) $\frac{20\times19\times18\times17}{4\times3\times2\times1}$ (C) $\frac{20\times19\times18}{3\times2\times1}$ (D) 20^4 (E) 4^{20}

24. n $(n > 2)$ number of points are marked inside a circle with radius 1 unit such that there are no two pairs of points with same distance between them. Each point is joined to the nearest point by a line segment. Which of the following is true?

I. No two lines intersect each other.
II. If $n > 6$ there are at least two points with the distance between them is less than 1.
III. When $n = 3$ the lines form a triangle with at least one side length less than $\sqrt{3}$.

(A) I only (B) I and II only (C) II and III only (D) All (E) I and III only

25. An array of 60 light bulbs are numbered from 1 to 60. At 1:00 AM all the lights are off. At the end of the nth minute (starting from 1:00 AM), the status (on/off) of the bulbs with number m, where m is a multiple of n will change (if it is on , it goes off and vice versa). How many bulbs will be on at 2:00AM?

(A) 30 (B) 31 (C) 7 (D) 6 (E) 22

6. Which of the following are true,

I. $12^{\frac{1}{6}} > 6^{\frac{1}{12}}$
II. $\left(\frac{1}{12}\right)^{6} > \left(\frac{1}{6}\right)^{12}$
III. $12^{\frac{1}{12}} > 6^{\frac{1}{6}}$

(A) I only (B) I and II only (C) II and III only (D) All (E) I and III only

7. Mina has eight coins, consisting of 5 Rupees coins and 10 Rupees coins, worth Rs.60. How many 5 Rupees coins does she have?

(A) 2 (B) 3 (C) 4 (D) 5 (E) 6

8. Mina and Kamala are playing Carrom at Mina's home. They agree that the first player to win either two consecutive games or a total of three games wins the match. In how many different ways can their match end if Mina wins the first game?

(A) 2 (B) 3 (C) 4 (D) 5 (E) 6

9. Numbers 1, 2, 3, …, 2014, 2015 are written on a board, how many 9's are written on the board?

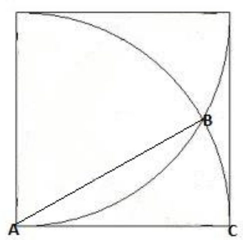
(A) 223 (B) 600 (C) 601 (D) 400 (E) 401

10. Two coins have four distinct positive integers written on their four faces. By tossing two coins together four times Rusiru observes that the sums of the numbers in the two faces obtained in the four consecutive tosses are 10, 11, 13 and 14 respectively. What is the largest possible number that could be written on a face?

(A) 6 (B) 8 (C) 9 (D) 12 (E) 10

11. Let A be the largest set of positive integers such that every integer in A, divides at least one of $10^{20}, 15^{10}, 24^{5}$. How many elements are there in A?

(A) 626 (B) 658 (C) 575 (D) 640 (E) None of the above



12. Two circular arcs which have a side of a square as a diameter intersects as in the given figure. What is the angle $BAC\measuredangle$?

(A) 20°
(B) 30°
(C) 15°
(D) 22.5°
(E) 25°

13. The number of pairs (a, b), where a,b are integers that satisfy such that $ab + 36 = 4a + 9b$ is

(A) 5 (B) 1 (C) Infinitely Many (D) 36 (E) 13

14. The number of different ways to choose integers $x_1, x_2, x_3, \ldots, x_{2015}$ such that $x_1x_2x_3 \ldots\ x_{2015} = 1$ is,

(A) Only one (B) Only two (C) 2^{2014} (D) 2^{2015} (E) $\frac{2015.2014}{2}$

15. How many positive integers less than 2015 can be written as a product of two consecutive positive integers?

(A) 21 (B) 22 (C) 44 (D) 45 (E) None of the above

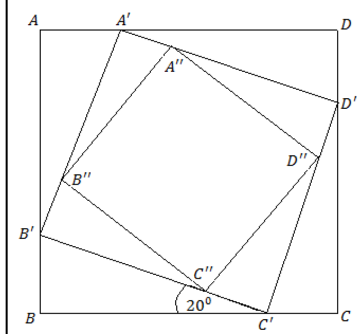
16. The sum of the squares of the list of numbers $a_1, a_2, a_3, \ldots, a_{2014}$ is equal to 2015. For $i = 1,2,3, \ldots 1007$ the following operation is performed: a_i is replaced by $(a_i - a_{2015-i})$ and a_{2015-i} is replaced by $(a_i + a_{2015-i})$. What is the sum of the squares of the new list of numbers?

(A) 2015
(B) 4030
(C) 8060
(D) 2014
(E) Cannot be determined from the given information

17. Three faces of a cube with a side 2015 units long is painted in red and the remaining faces are painted in blue, such that none of the corners of the cube are formed by three faces of the same colour. The cube is cut into small cubes with a side 1 unit long. How many such small cubes contain both blue and red?

(A) 16120 (B) 16112 (C) 20150 (D) 16128 (E) Cannot be determined from the given information

18. In the given figure $ABCD, A'B'C'D', A''B''C''D''$ are squares such that $A'B'C'D'$ is tilted at an angle of 20^0 with respect to $ABCD$ and $\frac{AB'}{B'B} = \frac{A'B''}{B''B'}$. At what angle is $A''B''C''D''$ tilted with respect to $ABCD$?



(A) I only
(B) II only
(C) III only
(D) II and III only
(E) All

19. A group of n players are participating in a chess tournament. In this tournament each player is competing against all the other players and no game is end in a draw. Which of the following statements are true? ($\lfloor x \rfloor$ is the largest integer less than x. Ex: $\lfloor 4.5 \rfloor = 4$)

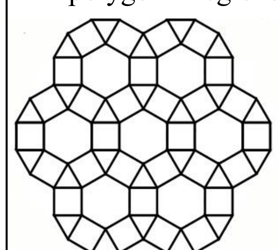
I. The number of total matches is $\frac{n(n-1)}{2}$.

II. There is at least one player with number of wins more than or equal to $\left\lfloor \frac{n}{2} \right\rfloor$.

III. If each player won at least 1 match, there are at least 2 players with the same number of wins.

(A) I only (B) I and II only (C) II and III only (D) All of the above (E) I and III only

20. Minimum number of colours required to colour the given diagram such that no two polygonal regions sharing a common side have the same colour is



(A) 6
(B) 5
(C) 4
(D) 3
(E) 2