Part A

1. Michelle wins two prizes worth a total amount of $9845. If the larger prize is $345 more than the smaller prize, what is the value of the smaller prize?

   (A) $4500   (B) $4700   (C) $4750   (D) $5095   (E) None of these answers

2. The value of $\dfrac{1}{\left(\dfrac{2+3}{4+5+6}\right)}$ is

   (A) $\dfrac{1}{15}$ (B) $\dfrac{1}{5}$ (C) $\dfrac{1}{3}$ (D) 3   (E) 5

3. Only one of these numbers does not give a remained of 3 when it is divided by 6. What is this number?

   (A) 915   (B) 2015   (C) 3015   (D) 3915   (E) 6015

4. Peter, John and Jack are making paper flowers. Working together, Peter and John make 45 flowers in an hour while Peter and Jack make 50 and John and Jack make 55, also in one hour. Working alone, how many flowers are made by Peter in an hour?

   (A) 15   (B) 20   (C) 25   (D) 30   (E) 35

5. Three friends have a total of 1000 marbles altogether. The first friend has 100 more than the second. The second friend has 300 more than the third. How many marbles has the third friend?

   (A) 100   (B) 200   (C) 300   (D) 400   (E) 500

6. If a car travels at a speed of 30 meters per second, what is its speed in kilometers per hour?

   (A) 72   (B) 90   (C) 108   (D) 110   (E) None of these answers

7. Beginning with 2 and counting by 9, you count 2, 11, 20, 29 … Which of these numbers will eventually be counted?

   (A) 98   (B) 99   (C) 100   (D) 101   (E) 102

8. The diagram shows a 3 by 3 square, a 4 by 8 rectangle and two right triangles. The area of the rectangle is equal to A, the area of the square is equal to B and the areas of the two right triangles are equal to C and D. Then the fraction $\dfrac{C+D}{A+B}$ is equal to
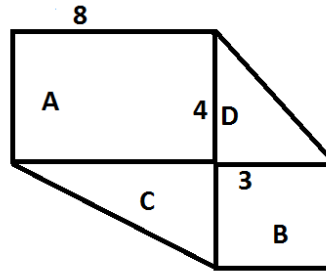
(A) $\dfrac{15}{41}$
(B) $\dfrac{18}{41}$
(C) $\dfrac{21}{38}$
(D) $\dfrac{24}{41}$
(E) $\dfrac{41}{18}$

9. You have two strange dice, one with 12 sides numbered 1, 2, …, 12 and the other with 8 sides numbered 1, 2, …, 8. When the two dice are thrown together, in how many ways can the sum of the results obtained be equal to 12?

(A) 6
(B) 8
(C) 11
(D) 12
(E) 16

10. The average height of a group of children would be increased by 5 cm if 10 of the children in the group were each 10 cm taller. How many children are in the group?

(A) 10
(B) 12
(C) 15
(D) 18
(E) 20

Part B

11. At the third Fredericton interplanetary meeting, the conference room is filled with humans and Martians. Martians are green creatures having two heads and five legs. If we can count 400 heads and 900 legs in the conference room, how many Martians are there?

   (A) 50　　　　(B) 100　　　　(C) 150　　　　(D) 200　　　　(E) 250

12. A solid cube of edge length 9 is painted blue and then cut in smaller cubes each of edge length 3. How many of the smaller cubes have been painted on exactly two faces?

   (A) 6　　　　(B) 8　　　　(C) 10　　　　(D) 12　　　　(E) 14

13. The perimeter of a triangle measures 17 cm. If the measures in cm of the two smaller sides of the triangle are the integers x and x + 2, then the measure of the third side is

   (A) 5 cm　　　　(B) 7 cm　　　　(C) 9 cm　　　　(D) 11 cm　　　　(E) 13 cm

14. ABCD is a rectangle twice as wide as it is high. E and F are the middle points of the sides AB and BD. What fraction of the total area of the rectangle is shaded?
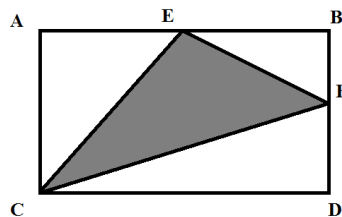
   (A) $\dfrac{1}{8}$　　　　(B) $\dfrac{1}{4}$　　　　(C) $\dfrac{3}{8}$　　　　(D) $\dfrac{1}{2}$　　　　(E) $\dfrac{5}{8}$

15. The sum of all numbers between 1 and 100 which are multiples of 7 is equal to

   (A) 315　　　　(B) 420　　　　(C) 525　　　　(D) 630　　　　(E) 735

16. A 4 by 4 square is said to be magical if you place into it the numbers from 1 to 16, once each, in such a way that the sum of all four numbers of each horizontal line, vertical line or diagonal line with four numbers is equal to 34. A possible value for X so that we can complete the square below into a magical square is

	1		7
	8		2
5		3	
4		6	X

   (A) 11　　　　(B) 12　　　　(C) 13　　　　(D) 14　　　　(E) 15

17. Elizabeth the millionaire started with $500 in her pocket the day she turned 20. Since then, her assets have doubled each year on her birthday. How old was she the first time she was a millionaire on her birthday?

    (A) 29   (B) 31   (C) 32   (D) 40   (E) 41

18. A 3 by 4 rectangle is inscribed in a circle. What is the circumference of the circle?

    (A) 2π (B) 3π (C) 4π (D) 5π (E) 10π

19. If $x^2 - y^2 = 51$ and $x - y = 3$ then y is equal to

    (A) 7   (B) 8   (C) 9   (D) 10   (E) 14

20. How many triangles of all sizes are there in the following diagram?

    (A) 24   (B) 32   (C) 40   (D) 44   (E) 48

Part C

21. A number is constructed using the first thousand even numbers written one after the other beginning with 2. This number then starts with 24681012141618 …
What is the 2015th digit of this number?

    (A) 1   (B) 2   (C) 4   (D) 6   (E) 8

22. All numbers from 1 to 31 are multiplied together. How many zeroes are there at the end of the result?

   (A) 3   (B) 5   (C) 6   (D) 7   (E) 8

23. In a bakery you can buy six kind of cakes including mochas, mille-feuilles and four other types. In how many ways can you buy three different types of cake without getting both a mocha and a mille-feuille?

    (A) 10   (B) 12   (C) 16   (D) 18   (E) 20

24. A plane flying east passes over another plane flying north at 9 AM. Each plane keeps its direction and its speed. At 9:30 AM, the distance between the planes is 600 km. If the first plane has traveled 360 km since 9 AM, then the speed of the other plane, in kilometers per hour, is

    (A) 240   (B) 360   (C) 480   (D) 720   (E) 960

25. You have to move from point A to point B either following straight lines (all are either horizontal or vertical) or portions of circles, with only one rule to follow: either travelling along a straight line or a portion of a circle, you should never move left. How many different paths are there between A and B?
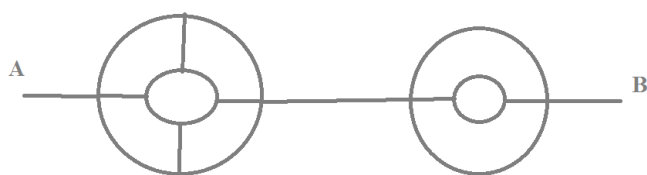
    (A) 8   (B) 10   (C) 12   (D) 24   (E) 32

26. How many integers between 1 and 1000 contains exactly one digit 3?

    (A) 243   (B) 252   (C) 262   (D) 271   (E) 729