Surname _____

Name _____

Father's name _____

THE G C SCHOOL OF CAREERS

MATHEMATICS SCHOOL

MATHEMATICS APTITUDE TEST

TIME: 1 HOUR 30 MINUTES

- This paper consists of **two parts**.
- The first part consists of **15 multiple choice questions**.
- The second part consists of **15 problems**.
- **Calculators** are **NOT** allowed for this examination.

Good Luck!

PART A – MULTIPLE CHOICE QUESTIONS

- **In this part there are 15 questions.**
- **Answer ALL questions.**
- **For each question there is ONLY ONE correct answer.**
- **CIRCLE the correct answer.**
- **Each question carries 2 marks.**

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1. Two school volleyball teams have 10 players each. Following the game every player on one team shakes hands with every player on the other team. How many handshakes will there be?

   (a) 50 (b) 90 (c) 100 (d) 180 (e) 200

2. In 1980, Antonia was 3 times as old as Despo, but in 1984 she was only twice as old as Despo was. How old was Despo in 1990?

   (a) 4 (b) 8 (c) 12 (d) 14 (e) 16

3. Which of the following **cannot** be expressed as the sum of three consecutive integers?

   (a) 18 (b) 24 (c) 28 (d) 33 (e) 36

4. What is the value of the following product?

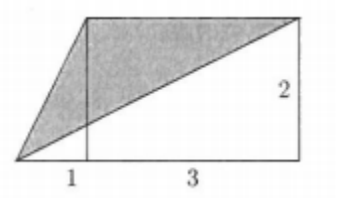
$$(1 - \frac{3}{4})\,(1 - \frac{3}{5})\,(1 - \frac{3}{6})\,\ldots\,(1 - \frac{3}{24})\,(1 - \frac{3}{25})$$

(b) $\frac{1}{230}$ (b) $\frac{1}{2300}$ (c) $\frac{1}{552}$ (d) $\frac{1}{2330}$ (e) $\frac{1}{233}$

5. A ball falls on the ground from a height of 250cm. Every time the ball hits the ground it goes up again by the $\frac{2}{5}$ of the height that it had reached before. What height will the ball reach after the 3rd time it hits the ground?

(a) 32 (b) 16 (c) 4 (d) 8 (e) 20

6. What is the area of the shaded region?



(a) 1.5 (b) 2 (c) 2.5 (d) 3 (e) 4

7. 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

8. Jessica has 4 times as many books as John and 5 times as many as Karen. If Karen has more than 40 books, what is the least number of books that Jessica can have?

(a) 240 (b) 220 (c) 210 (d) 205 (e) 200

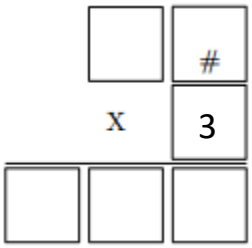
9. Only one of these numbers does **not** give a remainder of 3 when it is divided by 6. Which is it?

(a) 915 (b) 2015 (c) 3015 (d) 3915 (e) 6015

10. Consider four numbers **a**, **b**, **c** and **d**. The average of **a** and **b** is 10. The average of **b**, **c** and **d** is 20. The average of all four numbers is 19. What is the value of **a**?

(a) 16 (b) 4 (c) 5 (d) $\frac{20}{3}$ (e) $\frac{70}{6}$

11. Use the digits 1, 2, 4, 5 and 6 **only once** in one of the boxes to make the product correct. What is the value of the digit represented by "#" in the product?



(a) 1 (b) 2 (c) 4 (d) 5 (e) 6

12. On a Sunday I put two rabbits in a cage. If the number of rabbits in the cage doubled every day, on what day did the cage first have more than 100 rabbits in it?

(a) Thursday (b) Friday (c) Saturday (d) Sunday (e) Monday

13. Using the digits 1, 2, 3 and 4 **once and only once**, how many 3-digit numbers which are multiples of 3 can you write?

(a) 4 (b) 6 (c) 8 (d) 10 (e) 12

14. A Mathematics contest consists of 26 questions. Seven points are awarded for each correct answer, and 3 points are deducted for each wrong answer. If a question is omitted, no points are awarded. If John got a score of 76 on the contest, how many questions did he answer correctly?

(a) 10 (b) 11 (c) 12 (d) 13 (e) 14

15. A solid cube of edge length 9 is painted blue and then cut in smaller cubes 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

END OF PART A

Now you can continue with Part B

PART B – PROBLEMS

- **In this part there are 15 questions.**
- **Answer ALL questions in the space provided for each question.**
- **Show all your workings and write clearly your answers.**

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1. In a class test the rank of five students are:

   Alexia did not come second
   George did not come first
   Maria was neither first nor fifth
   Peter ranked one place lower than George
   Savvas ranked two places lower than Alexia

   Who came first, second, third, fourth and fifth?

   1st= ……. 2nd= …… 3rd= …..……4th= …..……..…..5th= ……...

   [5 marks]

2. If the difference between the measures of the two smaller angles of a right triangle is 20˚, what is the measure, in degrees, of the smallest angle?

   Answer: …….˚

   [4 marks]

3. Study the sample diagram. Note that

$2 + 8 = 10$ $5 + 3 = 8$ $2 + 5 = 7$ $8 + 3 = 11$

2	10	8
7		11
5	8	3

Complete each of these diagrams so that the same pattern holds.

(a)

	15	
11		20
	16	

(b)

	12	
10		21
	19	

[4 marks]

4. Work out the value of **W** in order for the equation to be valid.

$$2 \times \{3 \times [(\mathbf{W} + 450) - 200] + 105\} + 1 = 2011$$

Answer: W = ……

[5 marks]

5. At a High School, 100 students are taking Chemistry and 80 students are taking Biology. If 20 students are taking both Chemistry and Biology, what is the ratio of the number of students taking only Chemistry to the number taking only Biology?

Answer: ……

[5 marks]

6. A boy ate a total of 50 cookies in a number of consecutive days. Each day he ate 5 more cookies than the day before. How many cookies did he eat on the last day?

Answer: ……

[5 marks]

7. In the correctly worked out addition problem, each letter represents a different digit. What is the value of A?

AB + AB = BCC

Answer: A = ……

[4 marks]

8. Three bus services A, B and C arrive at a station. Service A arrives at the station every 15 minutes, service B every 20 minutes and service C every 40 minutes. Service A **returns** at the station at 06:20 after its first journey. When will all three of the buses meet at the station **again**? (Give the time).

Answer: ……

[5 marks]

9. A clock loses 2 minutes every 8 hours. Alicia's mother plans to set the alarm at 11 p.m. on Sunday night to get Alicia up each morning. Alicia has to get up each day no later than 7 a.m. What time should her mother set the alarm to be sure that Alicia isn't late to school any day, Monday through Friday?

Answer: ……

[5 marks]

10. A printer that can print 1 page in 5 seconds shuts down for 3 minutes to cool off after every hour of operation. How many **minutes** will the printer take to print 3600 pages?

Answer: …….. minutes
[5 marks]

11. Aaron, Brian, Chris and Dora need to get through a dark and narrow tunnel. They have only one lamp available. Aaron can go through the tunnel in **1 minute**, Brian in **2 minutes**, Chris in **3 minutes** and Dora in **4 minutes**. Since they are afraid of dark, none of them can go through without the lamp. The tunnel is so narrow that only two of them can go through at the same time. Find the least time needed for all four of them to get through the tunnel. Remember no one goes through the tunnel without the lamp! Explain how you obtained your answer.

Answer: …….. minutes
[4 marks]

12. When I went to the store I purchased four items. The following shows the cost of three of the items:

    €1.50, €3.00, €4.00

    The line to the checkout was pretty long, so I started playing with my pocket calculator while waiting.

    I found out that the four prices of the four items I purchased added to the same number as I got when I multiplied the four prices together.

    What was the price of the **fourth item**?

    Answer: €……

    [5 marks]

13. A jar contains 20 marbles: 4 red, 6 white, and 10 blue. If you remove 1 marble at a time, randomly, what is the minimum number that you must remove to be certain that you have at least 2 marbles of each color?

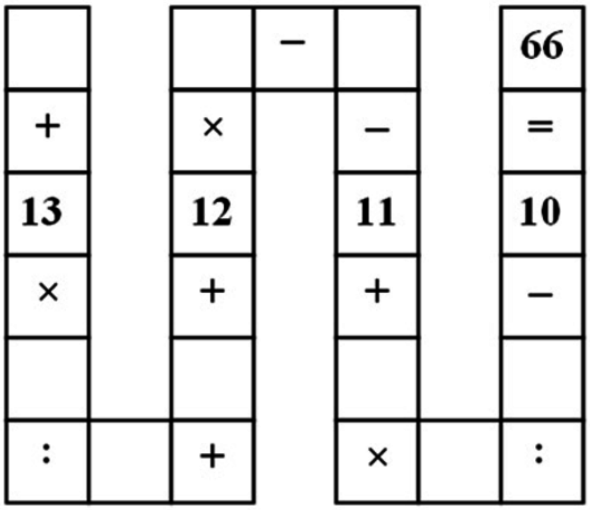
    Answer: ……

    [4 marks]

14. Three children guessed the number of jelly beans in a jar. The guesses were 98, 137, and 164. None of the guesses were correct. One guess was off by 12, another by 27, and the third by 39. How many jelly beans were in the jar?

Answer: …….. beans
[5 marks]

15. Fill in the blank boxes so that you get the final result 66.



[5 marks]

END OF PART B

TOTAL MARKS 100