HARRISON COLLEGE

END OF YEAR EXAMINATION

SECOND YEAR MATHEMATICS

DURATION: 1 HOUR AND 30 MINUTES

NAME: _____

FORM: _____

INSTRUCTIONS TO CANDIDATES

1. This paper consists of **FIVE** (5) printed pages.

2. Write your NAME and FORM clearly on the front of this paper

3. Answer **ALL** seventeen (17) questions in the spaces provided.

4. The use of calculators IS ALLOWED.

5. This paper consists of 5 multiple choice questions and 12 essay questions.

6. The maximum mark for this examination is 75

Section A: *Circle the letter of the response that best matches the correct answer*

1. How much simple interest is due on a loan of $120 for two years if the annual rate of interest is $5\frac{1}{2}$ per cent?

   (A) $12   **(B)** $13.20   **(C)** $26.40   **(D)** $33.00

2. $8x - 4(x - 5)$ simplifies to

   (A) $4x + 20$ **(B)** $4x + 5$ **(C)** $4x - 20$ **(D)** $4x - 20x$

3. John is x years old and his brother is 5 years older than half his age. His brother's age is represented as

   (A) $5x + 2$ **(B)** $2(x + 5)$ **(C)** $\frac{x+5}{2}$ **(D)** $\frac{5x}{2}$

4. The next term in the sequence 2, 1, −1, −4, −8 is

   (A) −16   **(B)** −13   **(C)** −12   **(D)** −10

5. A rectangular tank is 100cm long, 30cm wide and 12 cm deep. The volume of liquid it holds is

   (A) 3.6 litres   **(B)** 36 litres   **(C)** 360 litres   **(D)** 3600 litres

[5]

Section B: *Write the answers in the spaces provided*

6. Using a calculator or otherwise,
   (a) Calculate $(3.7)^2 - (6.24 \div 1.3)$

[3]

   (b) Write the following in standard form
       i.   0.00953

       ii.   203.41

[4]

7. A clerk is paid a basic wage of $35.50 per hour for a 40-hour week.
       i.   Calculate the clerk's weekly wage.

[2]

       ii.   For overtime the clerk is paid at one and a half times the basic rate. Calculate the amount earned in overtime if the clerk works an additional 6 hours overtime.

[2]

8. Solve
       i. $x + \frac{x}{3} = 8$

[3]

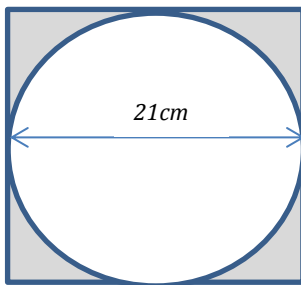   ii. $3y - (4 - y) = 8$

[3]

9. Mr. Greene deposited $60 000 into a fixed deposit account at a bank. The bank pays 8% per annum on fixed deposits.

    i.   What is the interest generated after 2 years?

[2]

    ii.   What is the balance on the account at the end of the 2 years?
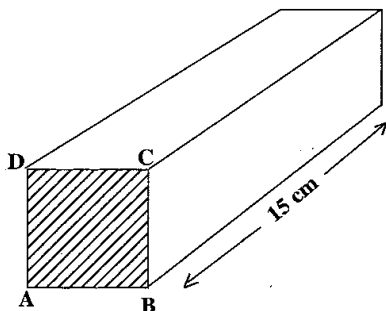
[1]

10. Calculate the area of the shaded region in the diagram below. (Use $\pi = \frac{22}{7}$)

21cm

[4]

11. The diagram below, **not drawn to scale**, shows a prism of volume 960 cm^3. The cross section ABCD is a square. The length of the prism is 15cm.
Calculate:

    i.   The length of edge AB in cm.

[3]

    ii.   The surface area of the prism in cm²

[3]

12. Expand and Simplify

    i. $2(x + 1) + 5(x + 3)$

[3]

    ii. $8x - 4(x - 5)$

[3]

13. From the Universal Set **U = {whole numbers greater than 1 but less than 11}**
G = {odd numbers} and **H = {multiples of 3}**

(a) Draw a Venn diagram to represent the information above

[5]

(b) List :

i. G ∩ H

[2]

ii. (G ∪ H)′

[3]

iii. G ∪ H′

[3]

14. Factorize the following:
i. $4ay + 4xy$

[2]

ii. $15a + 25b$

[2]

iii. $24pq + 16q^2$

[2]

15. The plan of a rectangular playing field is drawn to a scale of 1cm to 5000cm.

i. If the length if the field on the drawing is 8cm, calculate the actual length of the court in **meters**.

[2]

ii. The area of the field is 48 000 000cm², calculate the width of the field in **meters**.

[2]

3

16. Solve the following inequalities and show your solutions on a number line.

     i. $x - 3 < -8$

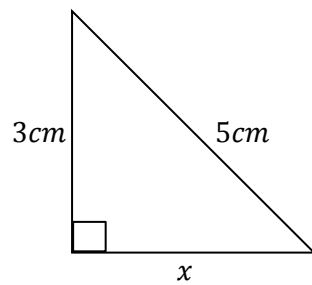   **[2]**

     ii. $6x + 5 \geq 8$

                                                                                                       [3]

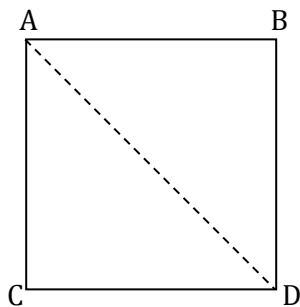17. Calculate

     i.   The length of the missing side.

                                                                                                    [3]

     ii.   The length of line AD if ABCD is a square of length of 9cm.

                                                                                                    [3]

SPACE FOR WORKING