HARRISON COLLEGE

END OF YEAR EXAMINATION

SECOND YEAR MATHEMATICS

DURATION: 1 HOUR AND 45 MINUTES

NAME: _____

FORM: _____

INSTRUCTIONS TO CANDIDATES

1. This paper consists of **SIX** (6) printed pages.
2. Write your NAME and FORM clearly on the front of this paper
3. This paper consists of 10 multiple choice questions and 12 essay questions.
4. Answer **ALL** twenty-two (22) questions in the spaces provided.
5. The use of calculators IS ALLOWED.
6. The maximum mark for this examination is 80

Section A

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

1. A rectangular block with a square base of side 6 cm has a volume of 288 cm^3. What is the height of the rectangular block in cm?

   (A) $48cm$ **(C)** $8cm$

   (B) $16cm$ **(D)** $3cm$

2. 6.75×10^3 equals

   (A) 0.00675 **(C)** 675

   (B) 0.0675 **(D)** 6750

3. Which statement below is incorrect?

   (A) $(-8) + (-4) = -12$ **(C)** $(-8) \times (-4) = -32$

   (B) $(-8) \div (-4) = 2$ **(D)** $(-8) - (-4) = -4$

4. Which of the following statement is correct?

   (A) $-4 > -3$ **(C)** $5 < 3$

   (B) $-7 > -11$ **(D)** $4 < -5$

5. 0.008×2.5 in standard form is

   (A) 2×10^{-2} **(C)** 2×10^{-1}

   (B) 2×10 **(D)** 2×10^2

6. 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 **(C)** \$26.40

   (B) \$13.20 **(D)** \$33.00

7. How long will it take for on \$960 to amount to \$61.20 at 8.5% per annum?

   (A) 7 years 2 month **(C)** 1 year 4 months

   (B) 3 years **(D)** 9 months

8. Mr. Archibald paid a fixed charge of \$25 plus \$0.55 for each kWh of electricity used. How much did he pay for using 75 kWh of electricity?

   (A) \$38.75 **(C)** \$100.55

   (B) \$66.25 **(D)** \$155.00

9. $8x - 4(x - 5)$ simplifies to

(A) $4x + 20$ **(C)** $4x - 20$

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

10. $\frac{4c}{7m} + \frac{3c}{5m}$ is the same as

(A) $\frac{41c}{35m}$ **(C)** $\frac{41cm}{12m}$

(B) $\frac{7c^2}{35m^2}$ **(D)** $\frac{20c + 21m}{35m}$

SECTION B

Instructions: *Write the answers in the spaces provided directly* ***under the question****.*

1. Using a calculator or otherwise,
   (a) Calculate $(1.25)^2 + 1.44 \div 1.2$

[3]

   (b) Write the following in standard form
      i. 0.0104

      ii. 764.2

[4]

2. Mr. Greene deposited $60 000 into a fixed deposit account at a bank. The bank pays 8% per annum on fixed deposits.
   a) What is the interest generated after 30 months?

[2]

   b) What is the balance on the account at the end of the 30 months?

[1]

3. The table below shows Jason's electricity bill for the month of April. Calculate the missing values at (i), (ii), (iii), (iv), (v) and (vi) and write them in the spaces provided.

Previous Reading 3011 kWh	**Present Reading** 3307 kWh	**kWh Used** (i) _____
Fixed Charge		$40.00
Energy Charge	@ $0.70 per kWh	(ii) _____
Fuel Charge	@ $0.55 per kWh	(iii) _____
Total Charge		(iv) _____
Tax 15%		(v) _____
Amount Due		(vi) _____

[6]

4. A clerk is paid a basic wage of $9.50 per hour for a 40-hour week.
   a) Calculate the clerk's weekly wage.

[2]

   b) 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]

5. Remove the brackets and simplify.

   a) $4(p-2q)-3(p+3q)$ **[3]**

   b) $5x-2(3-2x)$

[3]

6. Solve

a) $2 + \frac{2x}{3} = 8$

[3]

b) $2a - 2(4 - a) = 8$

[3]

7. Factorize the following:

a) $5pq - 3qr$

[2]

b) $3x^2y - 12xy^2$

[2]

8. Solve the following inequalities and show your solution on a number line

a) $3 + 4x < 23$

[2]

b) $2(5x - 6) \geq 4x + 6$

[3]

9. From the Universal Set **U = {whole numbers from 1 to 20}, F = {factors of 20}** and **M = {multiples of 5}**

a) Draw a Venn diagram to represent the information above

[5]

b) From your Venn diagram in 9 a), list the members of:

i. F ∩ M

[1]

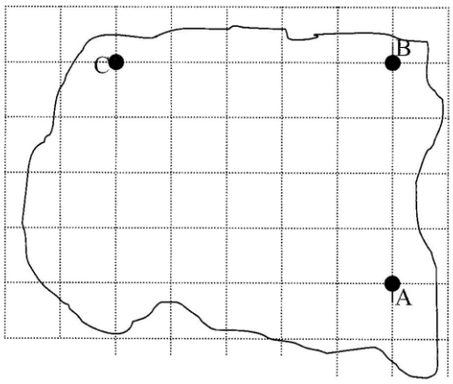
ii. $(F \cup M)'$

[1]

iii. $F \cup M'$

[1]

10. The diagram below shows a map of an island drawn on a grid of 1-cm squares. The map is drawn to a scale of 1:12 500.



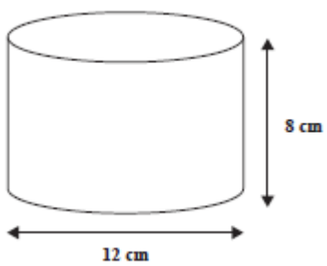
i. Calculate the distance**, in metres**, from town A to town C travelling from town A then through to town B then on to town C.

[2]

ii. Show **by calculation** the distance from town A directly to town C **in metres**.

[4]

11. The diagram below, not drawn to scale, represents a cylindrical can with a height of 8 cm. The diameter of the cross-section is12cm. (Use π =3.14)



(a) Calculate the circumference of the end of the can. **[1]**

(b) Calculate the area of the curved surface of the can. **[2]**

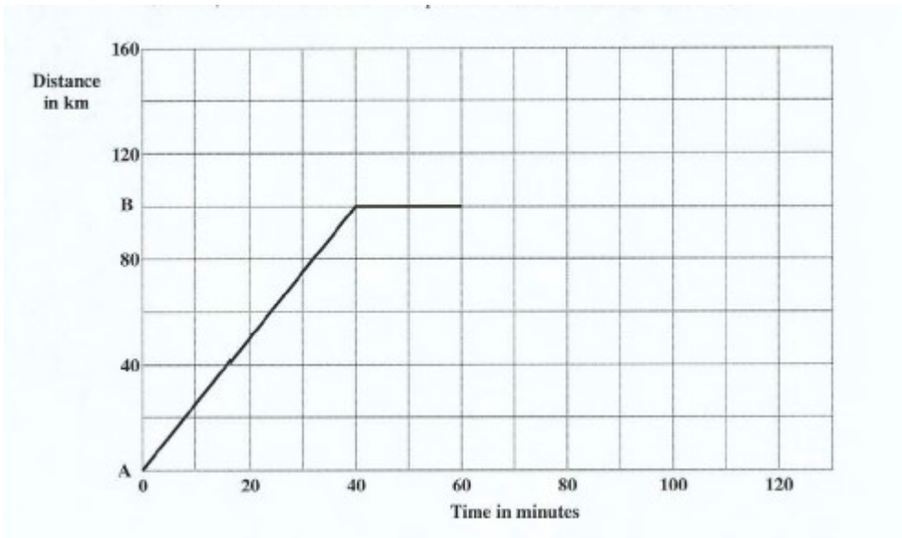
(c) If the can is open at one end, calculate the total surface area of the can.

[3]

(d) Calculate the volume of the can.

[2]

12. The distance-time graph below shows the journey of a train between two station A and B. An



(a) For how many minutes was the train at rest at B? **[1]**

(b) Calculate the average speed in km/h of the train on its journey from A to B.

[3]

The train continued its journey from Station B to another station C, which is 75km away from B. The average speed on this journey was 60km/h.

(c) Calculate the time in minutes, taken for the train to travel from B to C.

[3]

END OF EXAMINATION. PLEASE CHECK OVER