HARRISON COLLEGE

END OF YEAR EXAMINATION

2017 - 2018

FIRST YEAR MATHEMATICS

DURATION: 1 Hour and 30 Minutes

INSTRUCTIONS TO CANDIDATES

1) This question paper consists of **SIX** printed pages.

2) This paper contains of 8 multiple choice questions and 12 essay
   questions.

3) Figures are **NOT** drawn to scale.

4) Calculators are **NOT** allowed

5) The maximum mark for this Examination is 90

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SECTION A

ANSWER ALL QUESTIONS

WRITE THE LETTER THAT CORRESPONDS TO THE

CORRECT ANSWER ON THE FOOLSCAP.   **[8]**

1) $37\frac{1}{2}\%$ expressed as a fraction in its lowest terms is

   A. $\frac{3}{4}$ B. $\frac{1}{2}$ C. $\frac{3}{8}$ D. $\frac{1}{8}$

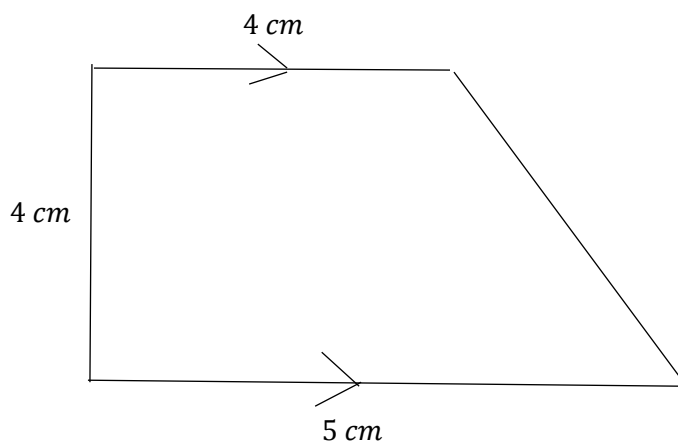2) The largest number that can be divided by $6, 9 \ and \ 12$ exactly is

   A. 3   B. 6   C. 12   D. 36

3) The area of this quadrilateral is

   A. $18 \ cm^2$ B. $4 \ cm^2$ C. $80 \ cm^2$ D. $10 \ cm^2$

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4) The perimeter of a rectangle is $26\ cm$. Its breadth is $4\ cm$. Its length in cm is

    A. 9   B. 11   C. 13   D. 17

5) 0.003867 to 3 significant figures is

    A. 0.004   B. 0.00386   C. 0.00387   D. 386

6) $16 - x = x$ is true when $x =$

    A. 0   B. 1   C. 2   D. 8

7) The value of $-1 - (-1)$ is

    A. 1   B. 2   C. 0   D. -1

8) If n is a member of the real numbers, which of these **CANNOT** be negative

    A. n B. n^2 C. $-n^2$ D. $-n$

SECTION B

SHOW ALL WORKING

1) Calculate the following

    a) $4 + (-5)$ [1]

    b) $-2 - 4$ [1]

    c) $3 - (-1)$ [1]

    d) 6×-3 [1]

    e) $\frac{(-2)^2}{-4}$ [2]

2) If $a = -3, \ b = -2$

    Calculate

    i. ab [2]

    ii. ab^2 [2]

    iii. $a^2 b$ [2]

    iv. $(ab)^2$ [2]

3) Simplify the following

    a) $2m \times 3mn$ [3]

    b) $\dfrac{4a^2 b^3}{18ab^2}$ [3]

    c) $6p + 6p \div 3$ [2]

    d) $3x + 2 \times (3 \times -3x)$ [3]

    e) $3a + 4b - a + 2b$ [2]

4) Express 124_8 in denary form (change to base 10).   [2]

5) Express as a single fraction

    i. $\dfrac{1}{5} \times \dfrac{2}{3}$ [2]

    ii. $\dfrac{1}{5} \div \dfrac{2}{3}$ [2]

    iii. $\dfrac{1}{5} + \dfrac{2}{3}$ [2]

6) The cost of $2\frac{1}{2}$ dozen eggs is \$7.50. Find the cost of $1\frac{1}{2}$ dozen eggs at the same rate.   [3]

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7) A shirt is available in the store 'Shirts-r-us' marked at $80 and offers a 20% discount. At another store 'Best Clothes' a similar shirt is marked at $60 and requires a 10% tax.

    i.   Which store offers the shirt at a lower price   [4]

   ii.   State the difference between the prices.   [2]

8) Determine

  i.   the exact value of $\dfrac{2\frac{3}{4}-1\frac{1}{8}}{1\frac{1}{5}\div\frac{3}{8}}$ [5]

  ii. $(1.7)^2-\dfrac{2.5}{1.5}$ to 2 decimal places   [4]

9) Solve the following equations

    a) $5+8a=37$ [2]

    b) $40=14a-30$ [2]
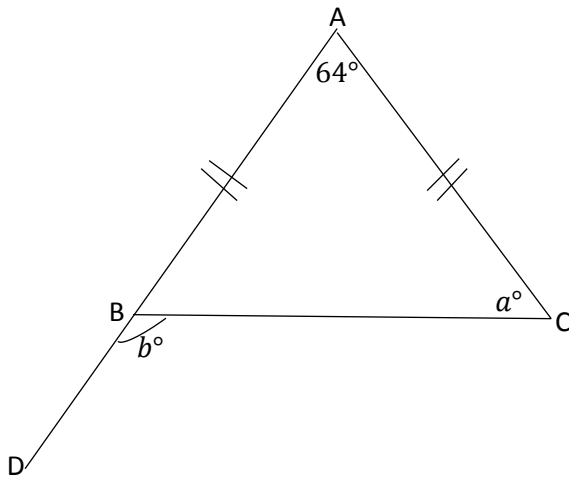
    c) $x+7=19+2x$ [3]

    d) $7=5+5x$ [2]

10) a) When $720 is divided in a ratio $3:5$, what is the smaller

share? [2]

   b) Seven men make 21 toys in 30 minutes. How long will it

   take 21 men to make the same 21 toys? [2]

   c) What is the mass of 20 books if 4 similar books have a

   mass of $800g$. [2]

11) Given that $AB = AC$ and $B\hat{A}C = 64°$

   Find the sizes of $a°$ and $b°$. Stating **ALL** the reasons for your

   answers. [6]

12) Given $\mho = \{f, o, r, m, u, l, a, e\}$

$A = \{f, r, a, m, e\}$

and $B = \{r, u, l, e\}$

a) Draw a Venn diagram for the information above showing

   A, B and $\mho$. [4]

b) List the following sets

   i. $A \cap B$ [1]

   ii. A' [1]

   iii. $(A \cap B)'$ [1]

c) Find $n(A \cap B)$ [1]

END OF EXAMINATION