

Sir Arthur Lewis Community College

Division of Agriculture

EXAMINATION SESSION : December 2017 Final Examination

LECTURER : Ms. Krissa Johnny

COURSE TITLE : Elementary Mathematics

COURSE CODE : MAT101

DATE : 14th December, 2017

DURATION : 2 hours



INSTRUCTIONS:

The exam consists of **TWO (2) Sections**. You are required to answer ALL questions in both sections in the spaces provided. **SHOW ALL NECESSARY WORKING.**

All writing must be done in black or blue ink.

Only non-programmable calculators are permitted.

SECTION A : 20 MARKS

SECTION B : 60 MARKS

TOTAL : 80 MARKS

Section A

Instructions: Shade the letter which corresponds to the best answer.

- The value of 0.386×0.06 is
(A) 0.02316 (B) 0.2316 (C) 2.316 (D) 23.16
- The set of fractions $\left\{\frac{3}{8}, \frac{1}{3}, \frac{1}{5}, \frac{1}{2}\right\}$ written in descending order of magnitude is
(A) $\left\{\frac{1}{5}, \frac{1}{3}, \frac{3}{8}, \frac{1}{2}\right\}$ (B) $\left\{\frac{1}{2}, \frac{3}{8}, \frac{1}{5}, \frac{1}{3}\right\}$ (C) $\left\{\frac{1}{2}, \frac{3}{8}, \frac{1}{3}, \frac{1}{5}\right\}$ (D) $\left\{\frac{3}{8}, \frac{1}{5}, \frac{1}{3}, \frac{1}{2}\right\}$
- The next number in the sequence 1, 4, 10, 22, 46, ... is
(A) 68 (B) 88 (C) 92 (D) 94
- Expressed as a product of prime numbers, 2 520 is
(A) $2^3 \times 3^2 \times 5 \times 7$ (B) $2^2 \times 3^3 \times 5 \times 7$ (C) $2^4 \times 3 \times 7$ (D) $2^3 \times 5 \times 11$
- Think of a number. Subtract 8 from it. Multiply the difference by 3. The result is 21. What is the original number?
(A) 1 (B) 3 (C) 10 (D) 15
- The number 3.14063 written to 3 decimal places is
(A) 3.140 (B) 3.141 (C) 3.146 (D) 3.150
- What is the least number of seeds that can be shared equally among 6, 9 or 12 farmers?
(A) 27 (B) 36 (C) 54 (D) 72
- The area of a square is 144 cm^2 . What is its perimeter?
(A) 48 cm (B) 96 cm (C) 72 cm (D) 216 cm
- The number 0.0346 expressed in standard form is
(A) 3.46×10^{-2} (B) 3.46×10^{-1} (C) 3.46×10 (D) 3.46×10^2
- If 10 books which cost \$25 are each sold for \$3, then the profit, expressed as a percentage of the cost price is
(A) 15 % (B) 20 % (C) 25 % (D) 30 %
- The circumference of a circle of diameter 28 metres is
(A) 44 metres (B) 88 metres (C) 56 metres (D) 70 metres
- If the mean of the four numbers 4, 8, x and 12 is 10, then x is
(A) 4 (B) 10 (C) 12 (D) 16
- The volume of a cube whose edge is 6 cm long is
(A) 18 cm^3 (B) 36 cm^3 (C) 72 cm^3 (D) 216 cm^3
- John, Peter and Mary shared a sum of money in the ratio 2:4:9. John and Peter together received \$360. How much money was shared altogether?
(A) \$480 (B) \$540 (C) \$600 (D) \$900
- How many litres of oil can a container of $4\,000 \text{ cm}^3$ hold?
(A) 2 (B) 4 (C) 6 (D) 8

16. The marked price of a pair of pants is \$100. If VAT of 15% is payable, then the price paid by the customer is
 (A) \$100.15 (B) \$85.00 (C) \$195.00 (D) \$115.00
17. If \$7000 is borrowed at the rate of 5% per annum for 3 years, the simple interest is
 (A) \$105 (B) \$210 (C) \$370 (D) \$1050
18. Which of the following sets is equivalent to {a, b, c, d}?
 (A) {4} (B) {a, b, c} (C) {p, q, r, s} (D) {1, 2, 3, 4, 5}
19. Written correct to 3 significant figures, 36 549 is
 (A) 37 000 (B) 36 000 (C) 36 500 (D) 36 600
20. The marked price of a refrigerator was \$2 350. A worker bought the refrigerator on term by making a deposit of \$1 000 and 15 monthly payments of \$99. How much would have been saved if the refrigerator had been bought by cash?
 (A) \$135 (B) \$1 500 (C) \$1 485 (D) \$485

Section B

Instructions: Answer ALL questions in this section and show ALL working.

1. (a) Calculate the EXACT value of

$$\frac{2\frac{1}{5} - 1\frac{2}{3}}{\frac{4}{7}}$$

giving your answer as a fraction in its lowest terms. (3 marks)

- (b) In a certain Caricom country, charges for electricity are made up of a fixed fuel charge of 45 cents per kWh and an energy charge computed under three schemes as follows:

Scheme A.	Homes	18 cents per kWh
Scheme B.	Schools	22 cents per kWh
Scheme C.	Business places	24 cents per kWh

The meter reading of a certain household reads as follows:

Meter reading (kWh)		kWh used	Scheme	Energy charge (\$)	Fuel Charge (\$)
Present	Previous				
7 201	7 076		A		

Calculate:

- (i) the number of kilowatt-hour used. (1 mark)

(ii) the energy charge in dollars. (2 marks)

(iii) the fuel charge in dollars. (2 marks)

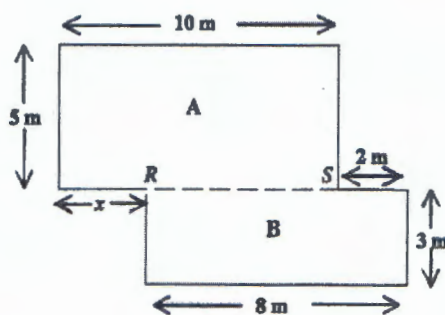
(iv) the amount the householder had to pay for the electricity used. (1 mark)

(v) the actual amount paid by the householder if a government tax of 15% is charged for electricity. (2 marks)

(c) BDS\$ means Barbados dollars and EC\$ means Eastern Caribbean dollars.

Peter exchanged BDS\$2 000 and received EC\$2 700. Calculate the value of one BDS\$ in EC\$. (2 marks)

2. The diagram below, **not drawn to scale**, represents the plan of a floor. The broken line RS, divides the floor into two rectangles, **A** and **B**.



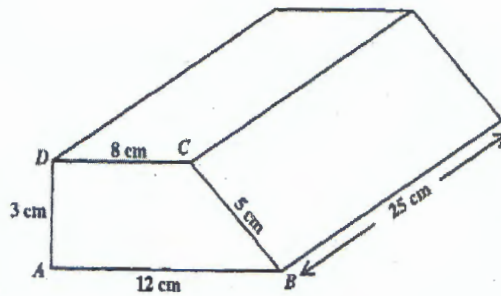
(a) (i) Calculate the length of RS. (1 mark)

(ii) Hence, state the value of x. (2 marks)

(b) Calculate the perimeter of the entire floor. (2 marks)

(c) Calculate the area of the entire floor. (3 marks)

3. The wooden prism, shown in the diagram below, not drawn to scale, is 25 cm long. The cross-section ABCD is a trapezium with AB parallel to DC, angle BAD = 90° , AB = 12 cm, BC = 5 cm, CD = 8 cm and AD = 3 cm.



Calculate:

- (a) The area of trapezium ABCD. (2 marks)

- (b) The volume of the wooden prism. (2 marks)

- (c) The total surface area of the prism. (4 marks)

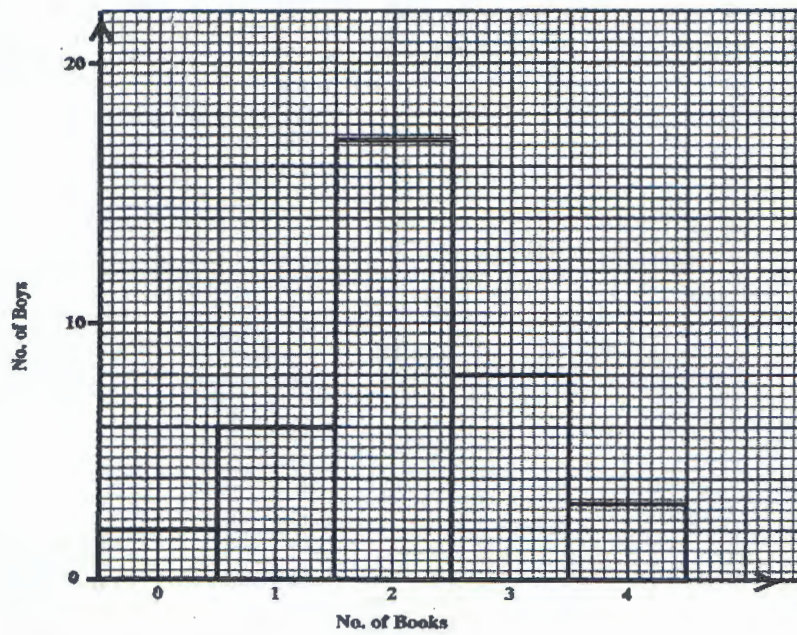
4. In a group of 60 students, 31 study Mathematics, 23 study Agriculture, x students study both Mathematics and Agriculture and 14 study neither Mathematics nor Agriculture.

- (a) Draw a Venn diagram to represent this information. (4 marks)

- (b) (i) Write an equation in x to represent the total number of students. (1 mark)

- (ii) Solve the equation to determine the number of students who study BOTH Mathematics and Agriculture. (1 mark)
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5. In a survey, all the boys in a Book Club were asked how many books they each read during the Easter vacation. The results are shown in the bar graph below.



- (a) Draw a frequency table to represent the data shown in the bar graph. (3 marks)

- (b) How many boys are there in the Book Club? (2 marks)
-
-

- (c) What is the modal number of books read? (1 mark)
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- (d) How many books did the boys read during the Easter vacation? (2 marks)
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- (e) Calculate the mean number of books read. (2 marks)
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6. (a) Given that $a = 2, b = 3$ and $c = -1$, find the value of:

(i) $a + b - c$

(2 marks)

(ii) $2a^b$

(2 marks)

(b) Solve the equation:

$2(3x + 1) = 15 - 4x$

(3 marks)

(c) Factorize completely:

(i) $16x - 8$

(2 marks)

(ii) $4ax - 4bx + 3ay - 3by$

(3 marks)

(d) Expand and simplify the following:

$(3p - 3)(p - 4)$

(3 marks)

End of Exam!

