



**SIR ARTHUR LEWIS COMMUNITY COLLEGE  
DIVISION OF AGRICULTURE**

**Certificate Students**

**Final Exam Semester II Academic Year 2000/2001**

**Course:** Elementary Mathematics II

**Date:** 15/05/2001

**Duration:** 2 ½ Hours

**Answer all questions in section A and any three questions in section B**

**Section A**

1. a) Find the value of  $y^3$  when  $y = 27^{-2}$   
 b) Simplify the following; i.)  $(3^6)^3 (3^9)^6$     ii.)  $(10^4 \div 10^{-2})^{1/4}$
2. Solve the following formulae:
  - a) Find the value of  $(a^2 - bc) \div (b + c)$  when  $a = 4$ ,  $b = -20$ , and  $c = 3$ .
  - b) Make R the subject of the formula  $A = \pi ((R-r) \div 2)^2$
3. Find the equations of the straight line passing through the following points:  
 (1, -3) and (5, 1)
4. In a survey of the wages earned per week by a 2 samples of 70 employees, the table below was obtained.

Wages per week(\$)	Sample I No. of employees	Sample 2 No. of employees
50-59	9	2
60-69	11	5
70-79	16	12
80-89	14	14
90-99	11	10
100-109	6	15
110-119	3	12

- a) Estimate the mean wages per week of the employees in each sample.
- b) Using a scale of 2cm to represent \$10 and 2cm to represent 5 employees, draw histograms to illustrate the wages of both samples.

5. Given the equations

$$\begin{aligned}x - 2y &= 8 \\ 3x + 5y &= -9.\end{aligned}$$

- a) Write the equations in matrix form
  - b) Determine the inverse of the  $2 \times 2$  matrix
  - c) Hence solve the equations
6. P is a point on level ground. P is 100 metres south of a vertical tower and the angle of elevation of the top of the tower from P is  $75^\circ$ .
- a) Sketch a diagram to show the information above
  - b) If the tower holds a 10-foot high water tank on its top, what is the height of the tower?
7. a) Using the factorization method solve the quadratic equation  $2x^2 - 11x - 21 = 0$
- b) Using the quadratic formula solve the equation  $-5x^2 - 7x - 3 = 0$

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**FINAL EXAM SEMESTER I – CERTIFICATE STUDENTS**

**Course:** Elementary Mathematics I – MAT511

**Date:** 6 December 2001

**Duration:** 2 Hours

**Please Answer All Questions**

1. Please Simplify the Following:

a)  $(2^5 \times 2^{-4}) \div (2^{-3} \div 2^1)$     b)  $27^{-2} \div 81^2$     c) find x if  $4^x = 256$     **(9 Marks)**

2. Find the exact value of:

$(3 \frac{1}{3} \div 2 \frac{5}{6}) \times (14/7)$

Write your answer as a decimal correct to 2 significant figures.

**(7 Marks)**

3. Calculate the exact value of

a)  $(1 \frac{2}{5} \times 3 \frac{2}{3}) - (13/7 \div 1 \frac{2}{3})$

b) Calculate the value of  $(1.0219) \div (0.8751)$  giving your answer to 2 significant figures

**(7 Marks)**

4. A farmer has a choice of taking a loan of \$45,000 from two Banks. Bank A offers the loan for 60 months at 12.5% per annum simple interest. The other Bank offers the loan for 54 months at 11.5% interest but the interest is compounded over the life of the loan. How much interest does the farmer pay on each loan?    **(7 marks)**

5. The College farm slaughters 12 pigs weighing a total of 1800 lbs. It obtains an overall dressing percentage of 65% on the carcasses and sells the resulting pork at a price of \$14.00 per kg. If the farm makes a 25% profit in selling its pork, what is its cost of producing the 10 pigs? What price per kg would the farm have to sell its pork to make a 10% profit?    **(9 marks)**

6. a) The sum of \$12,500 is divided among three people. Ray received one third, Peter received \$3500 and Queen received the remainder. Calculate Raymond's share, Queens share and the ratio in which the \$2500 was divided?
- b) A 64 acre farm was divided in the ratio 2:3:5:6. Calculate the size of each plot of land. **(7 marks)**
7. A cuboid shaped fishpond has a height of 9 metres and a base 25 metres wide by 30 metres long.
- a) What is the volume of the tank in litres?
- b) If the spacing for fish is 1 fish per 5 litres of water, how many fish can be kept in the pond when its 75% full of water?
- c) If the pond is filled with water at a rate of 30 litres per minute, how long will it take to fill the pond when empty? **(12 marks)**
8. a) State three properties of a rhombus with respect to its sides, angles and diagonals.
- b) A rhombus shaped has diagonals of 9.6 cm and 7.2 cm. Calculate the length of each side and the area of the rhombus. **(9 marks)**
9. A farmer owns a circular piece of land that is 1500 metres in diameter. What is the area of the land and what is its perimeter? If the farmer is fencing the land using rolls of wire that are each 50 metre long, how many rolls of wire must the farmer use to fence the entire plot of land?  
**(8marks)**