

1st SEM. 2013/2014



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UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

PROGRAMME: BSc. in Agricultural Economics and Agribusiness
Management Year I
BSc. in Agricultural Education Year I
BSc. in Agronomy Year I
BSc. in Animal Science Year I
BSc. in Food Science, Nutrition and Technology Year I
BSc. in consumer science Year I
BSc. in Consumer sciences Education Year I
BSc. in Horticulture Year I
BSc. in Agricultural & bios stems Engineering Year I
BSc. in Textiles Apparel Design and Management Year I

COURSE CODE: AEM 101

TITLE OF PAPER: MATHEMATICS

TIME ALLOWED: 2:00 HOURS

INSTRUCTION: ANSWER ALL QUESTIONS

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CHIEF INVIGILATOR

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Question 1, (20 points)

1.1. A quantity of alloy has a mass of 400 kg. It contains copper, lead and tin in the ratios by mass of

15:3:2. Find the mass of lead, copper and tin in the alloy? (10 points)

1.2 A wholesaler sells an article to a retailer for E2600 which represents a profit to the

wholesaler of 30%. The retailer then sells the article to a customer at a profit of

25%. Calculate the total percentage profit based on the price the wholesaler paid?

(10 points)

Question 2, (24 points)

2.1 Factorize completely

(8 points)

$$x^8 - y^8$$

2.2 Simplify

(8 points)

$$\frac{3}{x+1} + \frac{2x-1}{(x+1)(x+2)} - \frac{2}{x+2}$$

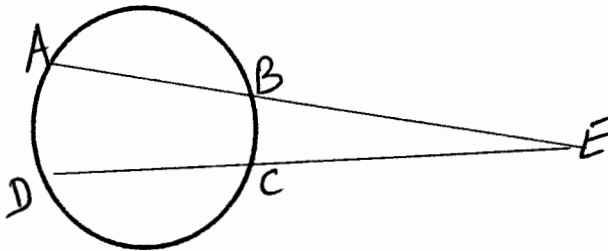
2.3 Find the solution set of system of simultaneous equation.

(8 points)

$$\begin{aligned}x^2 + y^2 - 6x + 5y &= 2 \\ x + y &= 9\end{aligned}$$

Question 3(24 points)

- 3.1. In the fig. Find the length of AB given BE = 8, CD = 7, CE = 9
(8 points)



- 3.2 Find the solution of exponential equation
 $(3)^{-x} = 81$ (8 points)

- 3.2. Find the solution set of logarithmic equation. (8 points)

$$\log_3^{(x+6)} - \log_3^{(x-2)} = 2$$

Question 4 (32 points)

- 4.1 The total area of a surface of a solid cylinder is 132 cm^3 . If the height of the cylinder is h cm and its radius r cm,

A) Show that $h = \frac{21}{r} - r$. (6 points)

- B) Calculate the value of r for which the volume of the cylinder is a maximum.
(take $\pi = 22/7$) (6 points)

- 4.2. The temperature of a piece of metal is S degree at time t minutes where

$$S = 10t^2 - 18t + 5.$$
 Calculate

- A) The time when the temperature is zero (5 points)

- B) The minimum temperature. (5 points)

- 4.3 Evaluate $\int_0^3 x^4 dx$

(5 points)

- 4.4 A woman standing on top of a cliff 100 m high is in line with two buoys whose angles of depression are 15° and 17° . Calculate the distance between the two buoys?

(5 points)

END OF PAPER