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UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION PAPER

PROGRAMME: BSc. in Agricultural & Biosystems Engineering Year I
BSc. in Agricultural Economics and Agribusiness
    Management Year I
BSc. in Agricultural Education Year I
BSc. in Agricultural Extension Year I
BSc. in Agronomy Year I
BSc. in Animal Science Dairy 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 Textiles Apparel Design and Management Year I

COURSE CODE: AEM 101

TITLE OF PAPER: MATHEMATICS

TIME ALLOWED: 2:00 HOURS

INSTRUCTION: ANSWER ALL QUESTIONS

DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE
CHIEF INVIGILATOR

Question I, (25 points)

1.1 A shopkeeper marks an article to allow himself 25% profit on the cost price. If he sells it For E 400 how much was the cost price?   (8 points)

1.2 A quantity of alloy has a mass of 600 kg. It contains copper, lead and tin in the ratios by mass of

4:5:1.Find the mass of lead .copper and tin in the alloy?   (8 points)

1.3 A wholesaler sells an article to a retailer for E5600 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?

(9 points)

Question 2, (25 points)
2.1 Factorize completely   (8 points)

$(5 - a)^2 - 49b^2$

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.   (9 points)
$$3x + 2y = 15$$
$$xy = 9$$

Question 3(25 points)

3.1 Find the solution of exponential equation
$$(5)^{-x} = 125$$
(8 points)

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

$$\log_3{^{(x+2)}} + \log_3{^{(x-2)}} = 3$$

3.3. If $\cos A = \frac{12}{13}$ find the values of sin A and tan A without calculator? (9 points)

Question 4 (25 points)

4.1 A man 1.8 m tall observes the angle of elevation of a tree to be 26^0. If he is standing 16 m from the tree, find the height of the tree.
(8 points)

4.2. Differentiate the following with respect to x
a) $y = 3x^4 + 6$
b) $y = \frac{4}{x^3}$

(9 points)

4.3 If $\frac{dy}{dx} = 2 + 3x$ and $y = 12$ when $x = 2$, find y in terms of x.

4.4 Evaluate $\int_0^1 x^4 + 3x + 4 \, dx$ dx

(8 points)

END OF PAPER