1st SEM. 2020 / 2021

UNIVERSITY OF ESWATINI

RE- SIT 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

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CHIEF INVIGILATOR

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Question 1. (25 points)

1.1 A man invests E 2000 at 6% per annum simple interest in order to pay school fees, for his son. He pays the fees of E500 partly from the interest and partly from the capital invested. How much of the capital is left after 3 years?   (5 points)

1.2 A wholesaler sells an article to a retailer for E66 00 which represents a profit to the

wholesaler of 20% .The retailer then sells the article to a customer at a profit of

10%.Calculate the total percentage profit based on the price the wholesaler paid?

(5 points)

1.3 Factorized $10(x-y)^2 - 5(y-x)$?   (5 points)

1.4 A shopkeeper marks an article to allow himself 10% profit on the cost price. If he sells it For E 4400 how much was the cost price?   (5 points)

1.5. simplify;   a) $(a^3 b^3)(a^{-2}b^3)$

   b) $\dfrac{9x^2-25}{9x^2-9x-10}$

   c) log x + log (x+6)

Question 2. (25 points)

2.1 Factorize completely $8x^3 - 125$ (5 points)

2.2 Simplify $\dfrac{2x}{x^2+x-6} + \dfrac{1}{(x-2)}$ (5 points)

2.3 Find the solution set of system of simultaneous equation.   (5 points)

$$x - y = 3$$
$$\frac{x}{5} - \frac{y}{7} = \frac{27}{35}$$

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2.4. Factorized completely   a) $4y^2-10y+6$

b) $a^2 - (p+q)^2$ (5 points)

2.5. If $A(x-1) + B(x+1) = 7x +9$ for all values of x, find the values of A and B? (5 points)

Question 3(25 points)

3.1 Find the solution of exponential equation   (5 points)

$(3)^{-x} = 27^{x+1}$

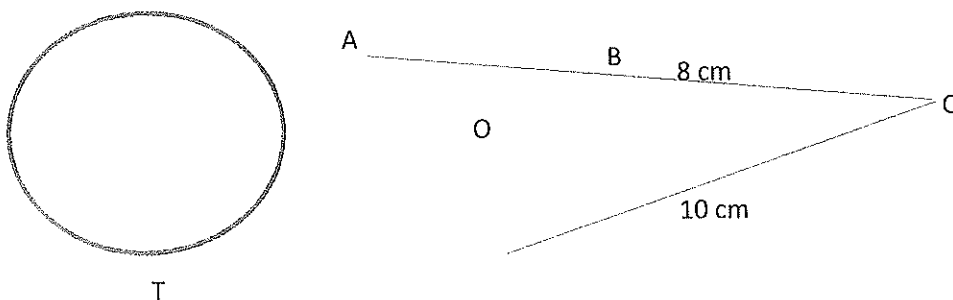3.2. Express $\log(75/16)-2\log(5/9)+\log(32/243)$ in terms of log 2 and log 3.

3.3 Find the solution set of logarithmic equation.   (5 points)

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

3.4. If $\cos A = \frac{12}{13}$ find the values of sin A and tan A without calculator?   (5 points)

3.5. In the figure below, TC is a tangent to the circle O. find the length AB, when BC = 8 cm and TC= 10 cm.   (5 points)

Question 4   (25 points)

4.1. The angle A is acute and $5 \sin^2 - 2 = \cos^2 A$, find the angle A?   (5 points)

4.2 Differentiate the following with respect to x

a) $y = 3x^8 +5x^3 -25x+36$

b) $y = \frac{3}{x^3} +7x-45$ (5 points)

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4.3 A man 1.8 m tall observes the angle of elevation of a tree to be 10^0. If he is standing 60 m from the tree, find the height of the tree.   (5 points)

4.4 Evaluate $\int_1^2 x + 3dx$

(5 points)

4.5. Given A=$\begin{pmatrix} 1 & 3 \\ -2 & 9 \end{pmatrix}$ and   B =$\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

Find a) A+B
    b) AB
    c) det(A)
    d) A⁻¹   (5 points)

END OF PAPER