1st SEM. 2015/2016

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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Question I, (25 points)

1.1 A sum of money is divided into two parts in the ratio of 3:7.If the smallest amount is E 200, Find the largest amount? (5 points)

1.2 Equipment belonging to a firm is valued at E X .Each year 10% of the value of the equipment is written off for depreciation. Find the value of the equipment at the end of n years? (10 points)

1.3 simplify the following

1.3.1 $\frac{x^2-x}{x-1}$, $x \neq 0$ (5 points)

1.3.2 $\frac{4x^2-9}{4x^2+12x+9}$ (5 points)

Question 2, (25 points)

2.1 Factorized the following

2.1.1 $\frac{1}{x^2} - \frac{1}{y^2}$ (5 points)

2.1.2 $a^4 - b^4$ (5 points)

2.2 Find the value of k(other than 0) for which $(4p-q)^2 + kpq$ is a perfect square.

(5 points)

2.3. Solve the equation

$\frac{2x}{x+2} = \frac{3x}{x+5} - 1$ (5 points)

2.4 If $A(x-1) + B(x+1) = 2x + 4$ for all values of x, find the values of A and B. (5 points)

Question 3, (25 points)

3.1 Solve the simultaneous equation

X+y=20

Xy=75 (5 points)

3.2 Find the solution of exponential equation (5 points)

$(1/3)^{-x} = 81$

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

$\log_2^{(x+6)} + \log_2^{x} = 2$

3.4 Differentiate the following

3.4.1 $y = 5x^4 - 7x^3 + 3x^2 + 3x - 9$ (5 points)

3.4.2 $y = \sqrt{x} + \frac{1}{\sqrt{x}}$ (5 points)

Question 4, (25 points)

4.1 A curve has the equation $y = 8 + 2x - x^2$.

a. Find the value of x for which the gradient of the curve is 6, (4 points)

b. Find the value of x which gives the maximum value of y. (4 points)

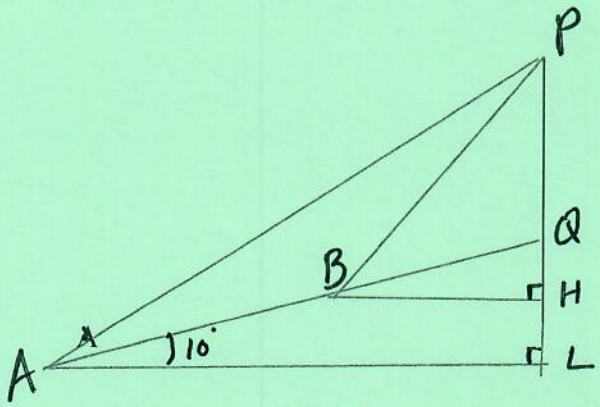
c. Find the maximum value of y. (4 points)

4.2 Evaluate $\int_0^2 x^3 \, dx$ dx (5 points)

4.4 Two points A and B on ground sloping at 10^0 to the horizontal are in line with Q, the foot of a vertical mast PQ, as shown in the figure below. If AB = BQ =20 m and PQ =25 m

Calculate

a) The height of P above the level of B (4 points)
b) The distance BP (4 points)



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