UNIVERSITY OF SWAZILAND

FINAL EXAMINATION 2011/12

BASS I

TITLE OF PAPER	:	ELEMENTARY QUANTITATIVE METHODS I
COURSE NUMBER	:	MS011
TIME ALLOWED	:	THREE (3) HOURS
INSTRUCTIONS	:	1. THIS PAPER CONSISTS OF SEVEN QUESTIONS. 2. ANSWER ANY FIVE QUESTIONS
SPECIAL REQUIREMENTS	:	NONE

THIS EXAMINATION PAPER SHOULD NOT BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR.

(b) If $kx^3 + 9x^2 - 3x - 7$ is divided by $x + 1$, the remainder is -4. Find the value of k. [M3A2]

(c) Use long division to evaluate $(6x^3 - 5x^2 + x - 4) \div (2x^2 - x + 3)$. [M6A4]

QUESTION 2

(a) Solve the following equations for x

(i) $\log_2 x + \log_2(x + 2) = 3$ [M3A3]

(ii) $\log(x^2 + 1) - \log(x - 2) = 1$ [M3A3]

(b) Evaluate

(i) $\log_3 243$ [M2A2]

(ii) $\log_{10} \frac{1}{10000}$ [M2A2]

QUESTION 3

(a) Prove the following trig identities

(i) $\sin\theta + \cos\theta \cot\theta = \theta$ [M3A2]

(ii) $\frac{(\sec\theta - 1)(\sec\theta + 1)}{\tan\theta} = \tan\theta$ [M3A2]

(b) (i) If $\tan\theta = \frac{3}{4}$ and θ is in θIII, find $\sin\theta$ and $\cos\theta$ [M3A2]

(ii) If $\sin\theta = \frac{12}{13}$ and θ is in θII, find the other 5 ratios. [M3A2]

QUESTION 4

a) Find all roots of $p(x) = x^3 - 9x^2 + 26x - 24 = 0$ [m6A4]

b) Solve the following trig equations

(i) $\cos 2\theta = \frac{1}{2}$ [M6A4]

(ii) $2\cos^2\theta + \cos\theta - 1 = 0$ [M3A2]

QUESTION 5

a) Find the amount at the end of nine years on an original principal of E4 500 at 8% if interest is

(i) simple interest [M3A2]

(ii) compounded annually [M3A2]

b) Find an equation for each of the following straight lines. Write your answer in 3 different form

(i) through $(2, 3)$ and $(4, 8)$ [M3A2]

(ii) through $(3, -3)$ and perpendicular to $2x + 3y = 6$ [M2A2]

QUESTION 6

a) Use synthetic division to find the quotient and the remainder when $p(x) = 2x^4+5x^3-2x62+4x+6$ is divided by $D(x) = x + 3$. [M6A4]

b) The area of a rectangle is 6 square metres. If the length is 1 metre longer than the width find the dimensions of the rectangle. [M6A4]

QUESTION 7

a) Givent that $f(x) = \dfrac{3}{x-2}$

(i) Find $f(8)$

(ii) Find $f^{-1}(x)$

(iii) Find $f^{-1}(\frac{1}{2})$ [10]

b) Given that $\sin\theta = \dfrac{3}{5}$ and θ is in θII.

Find

(i) $\sin 2\theta$

(ii) $\tan 2\theta$ [10]