INFORMATION AND COMMUNICATION UNIVERSITY

ICE0112: HIGHER MATHEMATICS 1: ASSIGNMENT 1

Lecturer's Name and Contact Details: Henry Sinkala, Mobile*: 0978316789*

Instructions:

Answer ALL Questions

1- Use the Assignment cover page provided below

*2- You are expected to type your assignment (or handwritten and save as **ONE** pdf file)*

3-Answer all questions and Label all your Solutions according to the Question Number

4- Use Times New Roman font type, font size 12 and 1.5-line spacing.(if typed)

5 – Deadline: The Assignment is due on 25th May 2022.

6- Assignment should be uploaded to the Portal

N.B: *Save the Assignment as: surname_firstname _ student #_module name_Assignment #*

E.g: Hamududu John_202112345_Higher Mathematics1_Assignment 1

Total Marks: 20 Marks

STUDENTS' COVER PAGE

INFORMATION AND COMMUNICATION UNIVERSITY

School:……

Degree Programme:…….

Course name and Code…….……..……

Assignment No.(1)

Student's Surname: ………

Student's First name: ……

Student number: ……..……..

Mode of Study: ……*(FT/DL)..(your mode of study)*

E-mail Address: ……*your email*

Phone Number: ……*your number*

Lecturer's name: ……..

Due Date: ***25th May 2022……***

ASSIGNMENT JAN -JULY 2022

QUESTION 1

a) Rationalize the denominators

i) $\frac{2\sqrt{2}+1}{4\sqrt{2}-3}$ ii) $\frac{2}{2\sqrt{3}+5}$ **[5 Marks]**

b) Evaluate the followings: *show your working.*

i) lg1000 ii) $\log_3(1/81)$ iii) $\log_5 2+\log_5 50-\log_5 4$

iv) $\log_2 40 - \log_2 5$

[10 Marks]

c)

Consider the subsets A = (-9, 0), B = [-3, 6] and C = [0, 6] of the universal set (-9, 9]. Find each of the following sets and display them on the number line.

i) (A ∩ B)' ii) (A ∩ B) n C iii) (A U B) 'n C' iv) A– B **[10 Marks]**

QUESTION 2

a) Given that $\boldsymbol{\theta}$ is acute and that $\tan \emptyset = \frac{1}{\sqrt{2}}$. Find values of $\sin \emptyset, \cos \emptyset, \csc \emptyset \sec \emptyset, \cot \emptyset$ leave your answers in surd form. **[6 Marks]**

b) Graph the following quadratic equation $y = -x^2-2x+3$; showing all your working **[9 Marks]**

c) Given that $f(x) = x^2+2$, $g(x) = 6x+2$ find:

i) (f o g(x)) ii) (g o f(x)) iii) (f o f(x)) iv) (g o g(x)) v)confirm that $f^{-1}(f(x))=x$ **[10 Marks]**

QUESTION 3

a) Convert $6\angle 30^\circ$ into a + j b form, correct to 4 significant figures. **[5 Marks]**

b) Determine, in polar form: $8\angle 30^\circ \times 5\angle 40^\circ$ **[5 Marks]**

c) Given $Z_1=2+j4$ and $Z2=3-j$ determine (i) Z_1+Z_2, (ii) $Z_1 - Z_2$, (iii) $Z_2 - Z_1$ and show the results on an Argand diagram. **[7 Marks]**

d) Determine the modulus and argument of the complex number Z =4+ j3, and express Z in polar form. **[8 Marks]**

QUESTION 4

a) Using the synthetic division find the quotient and the remainder when x^3-2x^2+9 is divided by x+2 **[5 Marks]**

b)

If A= $\begin{pmatrix} 2 & 3 \\ 1 & -4 \end{pmatrix}$ and B = $\begin{pmatrix} -5 & 2 \\ -3 & 4 \end{pmatrix}$ Find i) A x B ii) 3A-2B **[10 Marks]**

c) Prove the following identities

ASSIGNMENT JAN -JULY 2022

i $\cos ec\ x - \sin x = \cos x\ \cot x$

ii $\tan A + \cot A = \sec A\ \cos ecA$

iii $\sec\theta + \tan\theta = \dfrac{\cos\theta}{1-\sin\theta}$

iv $\dfrac{\sin A\ \tan A}{1-\cos A} = 1 + \sec A$

[10 Marks]