UGANDA MARTYRS UNIVERSITY

FACULTY OF BUSINESS ADMINISTRATION AND MANAGEMENT

SEMESTER I, 2016/17

FIRST YEAR TEST 1 FOR BACHELOR OF BUSINESS ADMINISTARTION AND MANANGEMENT

BAM 1 - RUBAGA

Fundamentals of Mathematics

FOM 1107

DATE: TUESDAY, 3 OCTOBER, 2017

TIME: 6: 30 PM - 7:30 PM

DURATION: 1 HOUR

Instructions:

1. Carefully read through ALL the questions before attempting
2. **Attempt QUESTION ONE and ANY OTHER TWO questions**
3. Ensure that your **Registration number** is indicated on your answer sheet

Question 1

Suppose I discovered that my cat had a taste for the gorgeous little geckoes that live in the bushes and vines in my yard, back when I lived in Arizona. In one month, suppose he deposited the following on my carpet: six gray geckoes, twelve geckoes that had dropped their tails in an effort to escape capture, and fifteen geckoes that he'd chewed on a little. Only one of the geckoes was gray, chewed on, and tailless; two were gray and tailless but not chewed on; two were gray and chewed on but not tailless. If there were a total of 24 geckoes left on my carpet that month, and all of the geckoes were at least one of "gray", "tailless", and "chewed on".

(i) **[10 marks]** summarize the above information in set language

(ii) **[10 marks]** represent the above information in venn diagrams

(iii) **[6 marks]** determine the number of geckoes that were tailless and chewed on but not grey

(iv) **[4 marks]** determine the number of geckoes that were grey and tailless

(v) **[6 marks]** determine the number of geckoes that were chewed on and ~~grew~~ grey only

(vi) **[4 marks]** determine the number of geckoes that were neither chewed on nor grey

Question 2

a) With relevant examples, explain the difference between the following:-

i. **[6 marks]** rational number and an irrational number

ii. **[6 marks]** set builder and roster form of representing a set

iii. **[6 marks]** equal sets and equivalent sets

b) Simplify the following expressions

i. **[6 marks]** $\sqrt{63} - 3\sqrt{245} - 5\sqrt{18} + 3\sqrt{90}$

ii. **[6 marks]** $\frac{\sqrt{7}-\sqrt{3}}{5+7\sqrt{5}}$

Question 3

a) **[10 marks]** let A = {1, 2, 3, 4}. Determine the binary relation **R** on **A.**

b) the following relations can be obtained from **R.**

$R_1 = \{ (a, b) \mid a \leq b \}$

$R_2 = \{ (a, b) \mid a > b \}$

$R_3 = \{ (a, b) \mid a = b - 2 \}$

$R_4 = \{ (a, b) \mid a + b \leq 3 \}$

i. **[8 marks]** List elements in R_1, R_2, R_3 and R_4

ii. **[4 marks]** is R_1, R_2, R_3 and R_4 transitive or not? Give a reason for your answer

iii. **[4 marks]** is R_1, R_2, R_3 and R_4 reflexive or not? Give a reason for your answer

iv. **[4 marks]** is R_1, R_2, R_3 and R_4 symmetric or not? Give a reason for your answer

Question 4

a) **[5 marks]** state the five laws of logarithms

b) Solve for x in each of the following equations

i. **[5 marks]** $\text{Log}6x - \log(3x - 1) = \log 18$

ii. **[5 marks]** $5^{\sqrt{x}} = 25^{3-2x}$

c) Given that log 5 = 0.70, log 2 = 0.30 and log 3 = 0.48; determine without using a calculator the values of the following expressions:

i. **[5 marks]** Log240

ii. **[5 marks]** log500

iii. **[5 marks]** $\log[\frac{54}{200}]$

Question 5

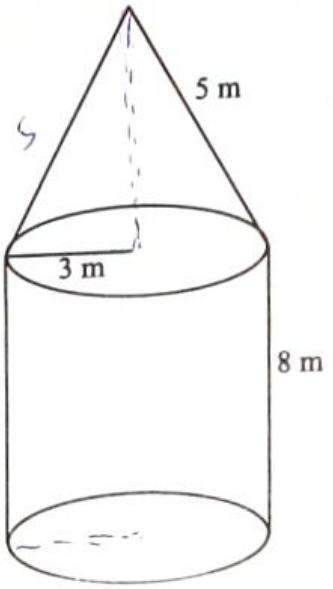
a) Simplify the following and leave your answer in index form

i. **[4 marks]** $P^2 \times 6P^3 + 24P^{-6}$

ii. **[4 marks]** $(\frac{3}{5}XY^4)^{-3}$

iii. **[4 marks]** $(Q^2R^{-3})^{-1}$

b) The diagram below shows a design of a water tank.



i. **[9 marks]** determine the maximum volume of water that the above tank would hold

ii. **[9 marks]** if the cost of one cubic meter of water is 10, 000/=; how much would you spend to buy a full tank of water?

END