PAN AFRICA CHRISTIAN UNIVERSITY

END OF SEMESTER EXAMINATION FOR THE DEGREE OF

BACHELORS OF COMMERCE

BACHELORS OF BUSINESS LEADERSHIP

BACHELOR OF BUSINESS INFORMATION TECHNOLOGY

JANUARY – APRIL 2018 SEMESTER

CAMPUS: ROYSAMBU

DEPARTMENT: BUSINESS STUDIES

COURSE CODE: BCM102|BUS2123|BIT102

COURSE TITLE: BUSINESS MATHEMATICS

EXAM DATE: FRIDAY 13TH APRIL 2018

TIME: 2:00PM-5:00PM

INSTRUCTIONS

- This examination script consists of S**ix (6)** questions.
- Read all questions carefully before attempting.
- Write your **student number** on the answer booklet provided.
- Question **ONE** is compulsory , answer any **FOUR** other questions

QUESTION ONE: COMPULSORY

a. Invoices produced within a firm are known to contain errors: 3% contains a very serious error, 6% a serious error and 12% a minor error.
Calculate the probability that a randomly chosen invoice will have a serious error or a minor error**. (5 Marks)**

b. Solve the following simultaneous equations:
$2x+ 3y = 42$
$5x- y = 20$ **(4 Marks)**

c. In a club with 60 members, everyone attends either on Tuesday for Drama (D) or on Thursday for Sports (S) or on both days for Drama and Sports. One week it is found that 48 members attend for Drama and 44 members attend for Sports and x members attend for both Drama and Sports.

i) Draw and label fully a Venn diagram to illustrate this information. **(6 Marks)**

(ii) Find the number of members who attend for both Drama and Sports. **(4 Marks)**

d. Solve the following pairs of equations graphically in the range 0 to 5
$4x- 5y = -5$
$5x+ 4y = 20$ **(10 Marks)**

e. Find the twenty first term of the following series: 3,5,7 **(4 Marks)**

f. A company buys a product from the manufacturer for 900 Kshs. They feel that they need to make a profit of 35% on the selling price to cover overheads. At what price should the company sell the product. **(4 Marks)**

g. Rearrange the following expressions to make x the subject .
   i. $3(5-2x) \leq 4+2x$ **(1 Mark)**

ii. $12 \div (4+x) > 6$ **(1 Mark)**

iii. $2+1/x \quad < \quad 3$ **(1 Mark)**

QUESTION TWO

a. Calculate the sum to infinity of the following series:

i. 8/3, 4/9, 2/27, ... **(3 Marks)**

ii. 5, -1, 1/5,… **(3 Marks)**

b. A box contains 4 reds beads, 1 blue bead and 2 yellow beads. Three beads are selected at random. If there is no replacement between each selection find the probability of selecting

i. One of each colour **(4 Marks)**

ii. Three of the same colour **(5 Marks)**

QUESTION THREE

a. A new company makes 250 products in the first week. If the rate at which these are produced increases by 6 each week , Find

i. How many will be produced in their 40^{th} week of manufacture. **(5 Marks)**

ii. The expected total produced after 12 weeks. **(5 Marks)**

b. Calculate the 10^{th} term and the sum of the first 10 numbers of the following series.
5, 7.5,11.25,… **(5 Marks)**

QUESTION FOUR

a. Calculate the interest rate percent per annum at which 552 kshs amounts to 896 kshs in 11 years at compound interest. **(3 Marks)**

b. In how many years will 1000 kshs amount to 3207 kshs at 6% p.a compound interest. **(3 Marks)**

c. Solve the following equations graphically. Use the values of x from -3 to +3

i. $y = 2x^2$ **(3 Marks)**

ii. $y = 2x^2 + 3$ **(3 Marks)**

iii. $y = 2x^2 - 4$ **(3 Marks)**

QUESTION FIVE

a. Calculate the annual repayment on a bank loan of 50,000 Kshs over eight years at 9% **(5 Marks)**

b. An initial investment of $2000 in a project yields cash inflows of $500,$500, $600,$600 and $440 at 12 monthly intervals. There is no scrap value. Funds are available to finance the project at 12%.

You are required decide whether the project is worthwhile, using

i. Net present value approach **(10 Marks)**

QUESTION SIX

a. A new machine costs $5,000 and is depreciated by 8% per annum. Calculate the book value of the new machine when it is five years old. **(5 Marks)**

b. Tom, Bill and Fred are in business together and one year make a profit of $39,000. They had previously agreed to share profits in the ratio 7:2:4 respectively. Calculate how much does each partner receive in money terms. **(5 Marks)**

c. A country population at the end of each year is greater by 2% than at the beginning of the year. Calculate the number of years required for the population to double.

(5 Marks)