PAN AFRICA CHRISTIAN UNIVERSITY

BACHELORS OF COMMERCE

END OF TERM EXAMINATION

DEPARTMENT: BUSINESS

COURSE CODE: BCM 102/BIT 102/BUS2123

COURSE TITLE: BUSINESS MATHEMATICS (ROYSAMBU EVENING)

EXAM DATE:

TIME:

INSTRUCTIONS

- Read all questions carefully before attempting.
- Question **One** is **compulsory** i.e Section **A** is **compulsory**
- Answer any **THREE** Questions in Section **B**
- Write your **student number** on the answer booklet provided.

SECTION A: COMPULSORY

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QUESTION ONE

a) A certain company produces 20 units of Product P and 40 units of Product Q at a total cost of Shs. 10,800 in the month of March 2020. The company also produced 30 units of Product P and 25 Units of Product Q at the total cost of Shs 9,200. In the month of April 2020.

Required

Using matrix algebra, calculate the cost of producing one uni to Product P and one unit of Product Q. (5 Marks)

b) Peter deposited Ksh 110 000 in a savings account of a local bank that pays an interest rate of 7% per annum (p.a) compound interest. Calculate the amount he would receive after 3 years if compounded semiannually. (3 Marks)

c) Find the equation of the lines passing through

i. Gradient ½ and points(4,6) (2 Marks)

SECTION B: CHOOSE ANY THREE QUESTIONS

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QUESTION TWO

Kwamboka deposited money in a fixed deposit account that pays interest at the rate of 10% per annum for 5 years. She also deposited a certain amount of money in an investment account that pays interest at the rate of 15% per annum for the same period.

At the end of 5 years, Kwamboka received Shs. 31,285 and Shs. 68,070 from the fixed deposit account and the investment account respectively.

Required

Determine the amount of money invested in each account based on:

i. Simple interest. (4 Marks)

ii. Compound interest. Assume interest was compounded quarterly. (6 Marks)

QUESTION THREE

a) A sales man earns a commission of 6% on sales of cement and 10% on sales of iron sheets. The selling price of a bag of cement is Shs. 700 while that of iron sheet is Shs. 1,500. During the month of August 2020, the number of bags of cement sold by the salesman was more than the number of iron sheets sold by 80. The salesman received a total commission of Shs 76,320 in the month of August 2020.

Required

i. The number of bags and iron sheets sold in the month of August 2020. (4 Marks)
ii. The commission received on the sale of both cement and iron sheets. (2 Marks)

b) A company wholesales a certain brand of shampoo in a particular town. Their marketing research department established the following weekly supply and demand equations:

Supply equation: $P = -1450 + 2Q$
Demand equation: $P = 300 - 6Q$

Calculate the number of units (Q) and price (P) required at equilibrium. (4 Marks)

QUESTION FOUR

A trader sold an article at sh.680,000 after allowing his customer a 12% discount on the marked price of the article. In so doing he made a profit of 35%.

a) Calculate
   (i) The marked price of the article. (3 Marks)
   (ii) The price at which the trader had bought the article (2 Marks)
b) If the trader had sold the same article without giving a discount. Calculate the percentage profit he would have made. (3 Marks)
a) To clear his stock, the trader decided to sell the remaining articles at a loss of 12.5%. Calculate the price at which he sold each article. (2 Marks)

QUESTION FIVE

a) The 8^{th} term of an arithmetic series is 57 and the 17^{th} term is 111.

Required

i. Determine the common difference (2 Marks)

ii. The first term (2 Marks)

iii. The sum of the first 28 terms (2 Marks)

b) Given that 75, x, 12….. is a Geometric Progression (G.P). Determine the possible value of x and the possible value of the fifth term of the G.P (4 Marks)

QUESTION SIX

a) Identify three application of set theory in business. (3 Marks)

b) The recent continental athletics games were attended by 380 athletics from three regions namely; Eastern, Western, and Southern.

The following information relates to the athletes who attended the games.

- 200 athletes represented the Eastern region.
- 160 athletes represented the Western region.
- 180 athletes represented the Southern region.
- 70 athletes represented both the Eastern and Western region.
- 66 athletes represented both the Western and Southern region.
- 96 athletes represented both Eastern and Southern regions.
- 15 athletes represented all the three regions.

Required

i. A Venn diagram to represent the information (4 Marks)

ii. The number of athletes that were not representing any of the three regions. (2 Marks)

iii. The number of athletes that represented only one region (1 Mark)