



PAN AFRICA CHRISTIAN UNIVERSITY
SCHOOL OF LEADERSHIP, BUSINESS AND TECHNOLOGY
END OF SEMESTER EXAMINATION FOR CERTIFICATE IN
ENTREPRENEURSHIP DEVELOPMENT
MAY – AUGUST 2018

CAMPUS: ROYSAMBU

DEPARTMENT: BUSINESS STUDIES

COURSE CODE: CENT0112

COURSE TITLE: BUSINESS MATHEMATICS

EXAM DATE: THURSDAY 9TH AUGUST 2018

TIME: 2:00PM-5:00PM

INSTRUCTIONS

- Read all questions carefully before attempting.
- Write your **student number** on the answer booklet provided.
- *Answer FIVE questions out of the SIX Provided*
- *Question ONE is Compulsory*
- *Write clearly and legibly.*
- *ALL PAC University's examination rules and regulations apply*

QUESTION ONE: COMPULSORY

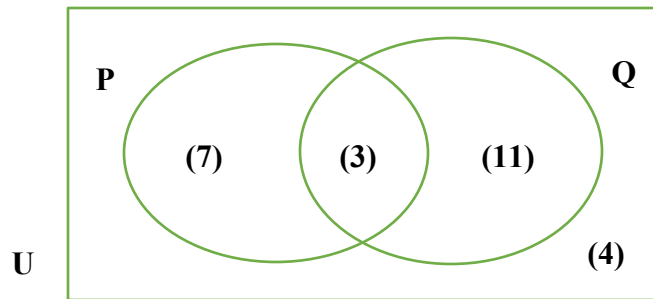
- a. Define the following terms:
- i. Disjoint sets (2 marks)
 - ii. Arithmetic Progression (2 marks)
 - iii. Linear Equation (2 marks)
- b. Solve for x in the following:
- i. $\frac{6x-7}{4} + \frac{3x-5}{7} = \frac{5x+78}{28}$ (3 marks)
 - ii. $2(3x+2) - 20 > 8(x-3)$ (3 marks)
 - iii. $9^{x+1} + 3^{2x+1} = 36$ (3 marks)
 - iv. $\log_2 x - 2 = \log_2 92$ (3 marks)
- c. Solve the following simultaneous equations (6 marks)
- $$\frac{x+y}{3} - \frac{x-y}{4} = 2 \dots\dots\dots (1)$$
- $$\frac{2x-3}{3} - \frac{2y+3}{4} = 19 \dots\dots\dots (2)$$
- d. Solve the following quadratic equation using completing the square method. (6 marks)
- $$x^2 + 5x = -1$$
- e. In a class of 60 students, 30 speak English language fluently while 25 speak French language fluently. Five students speak both languages.
- Required**
- i. Represent this information in a Venn Diagram. (2 marks)
 - ii. Calculate the number of students who speak either of the languages. (2 marks)
 - iii. Compute the number of students who speak only one language. (2 marks)
- f. Find the 127th term of the Arithmetic Progression given as 5, 8, 11 (4 marks)

QUESTION TWO

- a. Using Venn Diagrams, represent sets A and B.
- i. $U = \{2, 3, 4, 5, 6, 7\}$ $A = \{2, 4, 6\}$ $B = \{5, 7\}$ (2 marks)
 - ii. $U = \{1, 2, 3, 4, 5, 6, 7\}$ $A = \{2, 4, 5, 6\}$ $B = \{1, 4, 6, 7\}$ (2 marks)
 - iii. $U = \{3, 4, 5, 7\}$ $A = \{3, 4, 5, 7\}$ $B = \{3, 5\}$ (2 marks)

iv. $U = \{0, 2, 3, 4, 5, 6, 7\}$ $A = \{2, 4, 6\}$ $B = \{3, 5, 7\}$ (2 marks)

b. Consider the Venn Diagram below:



Required

If (3) means there are three elements in set $P \cap Q$, calculate how many elements are there in:

- i. P (2 marks)
- ii. Q^c (2 marks)
- iii. $P \cup Q$ (2 marks)
- iv. P but not Q (1 mark)

QUESTION THREE

- a. Using an example, define the following terms used in equations:
 - i. Unknown (3 marks)
 - ii. Constant (3 marks)
 - iii. Coefficient (3 marks)
 - iv. Index (3 marks)
- b. Solve the double inequality (3 marks)

$$-3 < 4(x + 2) - 3 < 9$$

QUESTION FOUR

- a. Carmen is 12 years older than David. Five years ago, the sum of their ages was 28.

Required

Calculate how old they both are today. (4 marks)

- b. Solve the equation (5 marks)

$$\frac{3}{2x + 1} + \frac{4}{5x - 1} = 2$$

- c. A group of students together bought a text book for their class that cost KES 9,600. However, 2 students failed to pay their share, so each student had to pay KES 400 more.

Required

Compute how many students were in the original group. **(6 marks)**

QUESTION FIVE

- a. Write the following pairs of simple inequality statements as compound statements and illustrate them on a number line.

i. $x \leq 3$ and $x > -3$ **(2 marks)**

ii. $x > -1$ and $x < 2$ **(2 marks)**

- b. Solve the following inequalities

i. $3x - 4 \geq 5$ **(2 marks)**

ii. $\frac{1}{4}x + 5 \leq 14$ **(2 marks)**

- c. Solve for x

i. $27^{3x+5} = 81^{4x+1}$ **(2 marks)**

ii. $\text{Log}_{125} 5 = x$ **(2 marks)**

iii. $\text{Log}_2 (3x+5) = 4$ **(3 marks)**

QUESTION SIX

- a. The 21st term of an Arithmetic Progression is 50,000. If the first term is 20,000, Calculate the common difference. **(5 marks)**

- b. Find the sum of the 28th term of the arithmetic progression $3 + 10 + 17 + \dots$

(4

marks)

- c. Below is a series;

$2 + 4 + 8 + 16 + \dots$

Required

Find the value of the 20th term of the sequence. **(3 marks)**

- d. Calculate the sum of the eight terms of the Geometric Progression 2, 6, 18

(3

marks)