



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION FOR BACHELOR OF BUSINESS ADMINISTRATION
WITH IT FOR FIRST YEAR SECOND SEMESTER

COURSE CODE: ABA 107: MANAGEMENT MATHEMATICS 1

DURATION: 2HOURS

APRIL 2017

MAIN CAMPUS

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO

QUESTION ONE (30 MARKS)

(a) Solve by elimination method

$$5x+2y=-5$$

$$-3x+4y=29 \quad (4\text{mks})$$

(b) If $X=(a,b,c,d,e)$ $Y=(c,d,e,f)$ and $Z=(a,c,d,e,g,h)$ within a universal set of (a,b,c,d,e,f,g,h,i) list the elements of the following

(i) $(X \cup Y)$ (2mks)

(ii) $(X \cap Y)$ (2mks)

(c) A finance company loans money at 20% nominal interest but compounds monthly. What is the APR? (4mks).

(d) A company buys a computer for £125,000 and houses it in a special constructed suite at a cost of £ 20,000.

(i) If the computer depreciates at 25 % (reducing balance) and the suite appreciates at 5 % (compound). What is the book value of suite and computer after 5 years (3mks).

(ii) Taking computer and suite together and using the reducing balance method. What is the overall depreciation rate? (3mks)

(e) Find the equation of the line perpendicular to the line $y-5x+3=0$ and passing through points (3, 2) (4mks)

(f) Find the common ratio and the eleventh term of the following sequence $2/9, 2/3, 2, 6, 18, \dots$ (4mks)

(g) If 4,000 is deposited into an account paying 6% annual interest compound quarterly, how much will be in the account after 5 years? (4mks)

QUESTION TWO (20 MARKS)

(a) In a given college, students admitted for a course in business management take up to a maximum of three optional subjects in a year. When 56 students had been enrolled, 16 took sociology and an optional subject while 21 studied communication skills and 20 studied statistics, 7 studied sociology and communication skills and 8 studied communication skills and statistics, 5 studied sociology and statistics while 3 studied all the three optional subjects.

(i) Represent the information in a Venn diagram (5mks)

(ii) Determine the number of students who study statistics and communication skills but not sociology (4mks)

(iii) The number of those who study sociology alone (2mks)

(iv) Total number of students who took optional subjects (2mks)

(v) The number of those who studied at least two subjects (2mks)

(b) A man deposited shs 8,550 in a bank which pays 13% per annum compound interest. In how many years will the money grow to shs 49,500 (5mks)

QUESTION THREE (20 MARKS)

A firm is considering two separate capital projects with cash as follows

year	0	1	2	3	4	5
Project 1	80,000	18,000	20,000	25,000	38,000	45,000
Project2	120,000	30,000	50,000	50,000	50,000	15,000

- (a) Using the NPV criterion and a discount rate of 15%, choose the project that is more profitable (5mks)
- (b) Find the NPV using a discount rate of 20% and use the result to estimate the IRR for each project (8mks)
- (c) Verify that using the IRR criterion the decision in (b) is reversed and attempt to explain why (4mks).

QUESTION FOUR (20 MARKS)

- (a) (i) Solve for x, y and z

$$3x+2y-z= -1$$

$$x+ y+z= 6$$

$$3x+y+2z=15 \quad (4mks)$$

- (ii) A company manufactures three products x, y and z each of which must go through three processes A, B and C for the following times

Product	time spent in process		
	A	B	C
X	3	3	1
Y	3	2	3
Z	2	0	1

The maximum capacities of process A, B and C are 130, 85 and 60 respectively.

Calculate the numbers of units to be produced of products x, y and z to ensure the utilization of maximum capacity. (6mks)

(b) A company is thinking of borrowing £70,000 to invest in a project which is expected to yield £20,000 at the end of each of the next 6 years. If the cost of capital is 20%

(a) Draw up a discounted cash flow table and hence calculate the NPV of the project (8mks)

(b) Interpret the above value of the NPV in the light of situation (2mks)

QUESTION FIVE (20 MARKS)

(a) ABCD is a rectangle with the centre at the origin. A is the point (5,0) point B and C lie on the line $2y=x+5$

Determine the coordinates of the other vertices (6mks)

(b) Determine the present value of £125 payable at the end of each of five years and subject to a discount rate of 8% (4mks)

(c) A survey of 600 jua kali workers showed that 310 regularly listened to seven o'clock news on radio and that 370 regularly listened to late night news on radio while 120 regularly listened to both news casts. Determine the workers who listened to

(i) The seven o'clock news but not the late-night news (3mks)

(ii) The late night news but not the seven o'clock news (3mks)

(iii) Exactly one of the news broadcast (3mks)

(iv) At least one of the news broadcast (1mk)

SCHOOL OF BUSINESS AND ECONOMICS
JARAMOGI OGINGA ODINGA UNIVERSITY (MAIN CAMPUS)
ABA 107: MANAGEMENT MATHEMATICS 1
COURSE OUTLINE: JAN-APRIL 2017

Instructor: Mr. Amos Asembo

Class meets: Wednesday

Time: 11.00am -1.00pm

Course description

This course provides the learner with the skills and competencies for them to articulate and analyze basic concepts of set theory, Venn diagrams, functions and to be able to solve basic mathematics for finance and capital investment appraisal.

Learning objectives

The objective of this course is to enhance the analytical and problem solving skills of the learner with respect to basic concepts of set theory. Venn diagrams, functions, simultaneous equations, mathematics for finance and capital investment appraisal.

Expected Learning Outcomes:

At the end of the learning exercise the learner is expected to:

1. Understand set theory
2. Understand Venn diagrams
3. Understand Linear and non Linear functions
4. Understand establishing of functions and application of functions
5. Understand simultaneous equation
6. Understand simple and compound interests
7. Understand present and future values

8. Understand annuities
9. Understand capital investment appraisal.

TOPICS COVERED

Week	Topic
One	Set theory
Two	Venn diagrams
Three	Linear functions
Four	Non –Linear functions
Five	Establishing functions
Six	Application of functions
Seven	Simultaneous equations
Eight	Simultaneous equations
Nine	Mathematics for finance simple and compound interests
Ten	CAT
Eleven	Present and Future Values
Twelve	Annuities
Thirteen	Capital Investment appraisal

Teaching methodology

Lecturer, group discussion and presentations

Grading

Assignment	10%
Sit –in –tests	20%
Semester Examination	70%

Required Reading

1. Terry Lucey (2002) Quantitative Techniques
2. N.A. Saleemi (2011) Quantitative Techniques simplified
3. Teresa Bradley & Paul Patton (2002) Essential Mathematics for Economics and Business
4. Andre Francis (2008) sixth Edition. Business Mathematics and Statistics

5. Any other relevant textbook on management mathematics and relevant websites.

NB: Please contact the librarian for more E- Learning.

Signed

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Course instructor

Dean SBL