

**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS FOR THE DEGREE OF BACHELOR OF BUSINESS ADMISTRATION**

**1ST YEAR 1ST SEMESTER 2016/2017 ACADEMIC YEAR**

**E-LEARNING**

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**COURSE CODE: ABA 107**

 **COURSE TITLE: MANAGEMENT MATHEMATICS 1**

**VENUE: STREAMS: DEGREE**

**TIME: 2 HOURS**

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**Instructions**

* **Answer question ONE and any other TWO questions in this paper**
* **Candidates are advised not to write on the question paper.**
* **Candidates must hand in their answer booklets to invigilator while in examination room**

**QUESTION ONE**

**(a**) Solve by substitution method

 2x-3y=8

 3x+4y=-5 (4mks)

(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) (XUY) (2mks)

(ii) (X∩Y)’ (2mks)

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

(d) i) How many numbers of two different digits can be formed with the figure 1,2,3,4,5,6 (3mks)

ii) In how many ways 6 people can be chosen out of eight? (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 sequence2/9, 2/3 , 2,6,18…………..(4mks)

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

 **QUESTION TWO**

* 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**

 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**

* **(i)** Solve for x, y and z

3x+2y-z= -1

x+ y+z= 6

3x+y+2z=15 (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 utilizatation 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**

* A manufacturer knows that if x (hundred) products are demanded in a particular week
* the total cost function ( £000) is 14+3x and
* the total revenue function ( £000) is 19x-2x2

a) Determine the total profit function (2mks)

b) Find the profit break- even points (2mks)

c) Calculate the level of demand that maximizes profit and the amount of profit obtained (2mks)

 (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 that310 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)