JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF BUSINESS AND ECONOMICS

UNIVERSITY EXAMINATION FOR THE DIPLOMA OF BUSINESS ADMNISTRATION WITH I.T

2ND YEAR 2ND SEMESTER 2018/2019 ACADEMIC YEAR

NAIROBI CITY LEARNING CENTRE

COURSE CODE: BBM 2112

COURSE TITLE: BUSINESS MATHEMATICS

EXAM VENUE: 12TH FL RM 1 **STREAM: (BBA)**

DATE: 3/12/2018 **EXAM SESSION: 2:00 – 4:00PM**

TIME: 2.00 HOURS

INSTRUCTIONS:

1. **Answer Question ONE (COMPULSORY) and ANY other 2 questions.**
2. **Candidates are advised not to write on the question paper.**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room.**

SECTION A

Question One

a) Salsha Ltd is small company located in Nairobi. The company has a policy of fixed annual salary increments to its employees. If an employee had a final salary of shs. 9,000 and a total salary of shs. 65,000 after 10 years.
   (i) what was his initial salary?
   (ii) After how long would the employee be earning a salary of shs. 12,000?
   (8 marks)

(b) Differentiate between the following terms as used in financial mathematics:

   (i) common ratio and common difference (2 marks)
   (ii) Compounding and discounting (2 marks)

(c) Under Investment Appraisal, Outline:
   i) Two disadvantages of the Accounting Rate of Return(ARR)
   ii) Two advantages of Net Present Value methods(NPV) (4 marks)

(d) How long would it take a given sum of money to double itself at 10% under:
   (i) Simple interest
   (ii) Compound interest
   (8 marks)

(e) Discuss the major steps in decision making. (8 marks)

SECTION B

Question Two

Vapor Ltd has a cost of capital of 15% and is considering which project it should initiate. The following projects are being considered:

		Estimated cash-flows			
Project	year 0	year 1	year 2	year 3	Year 4
A	(40000)	30,000	30000	8,000	12,000
B	(40,000)	30,000	29,000	13,000	17,000

C	(50,000)	40,000	44,000	11,000	19,000

Evaluate the projects and give your decision under the following appraisal techniques:

a) Pay back (PBP)

b) Net present Value (NPV) (20 marks)

Question Three

A manufacturer makes two products, Bread and Butter. The cost of making 15 units of Bread and 10 units of Butter is kshs. 600. The cost of making 5 units of Bread and 8 units of Butter is Ksh. 340. The manufacturer makes a profit of 20% and 25% on each unit of Bread and Butter respectively.

i) Express the above problem in terms of simultaneous equations.

ii) Calculate the cost of making one unit of product Bread and Butter.

iii) Calculate the price of one unit of product Bread and Butter.

iv) How much profit will the manufacturer earn by selling 1000 units of Butter and 500 units of Bread? (20 marks)

Question Four

(a) A firm's has analysed the operating conditions, prices and costs and have developed the following functions:

Revenue, shs. $R = 400Q - 4Q^2$ COST shs. $C = Q^2 + 10Q + 30$

Where Q is the number of Units sold.

The firm wishes to maximize profit and to know:

a) What quantity should be sold?

b) At what price?

c) What will be the amount of profit? (10 marks)

Question Five

a) Differentiate between risk and uncertainty. (4 marks)

(b) From the past experience it is known that a machine is set up correctly on 95% of the occasions. If the machine is set up correctly then the conditional probability of good operation is 85% but if the machine is not set up correctly then the conditional probability of a good operation is only 20%.

On a particular day the machine is set and first operation is found to be good.

i) Draw a tree diagram to represent the above information. (4 marks)

ii) What is the probability that the machine is set up correctly? (3 marks)

(c) The following are given possible net cash-flows of projects M and N and their associated probabilities. Use 8% as the cost of capital for the projects evaluation.

	Project M		Project N	
Possible event	cash-flows	probability	cash- flows	probability
A	4,000	0.10	12,000	0.10
B	5,000	0.20	10,000	0.15
C	6,000	0.40	8,000	0.50
D	7,000	0.20	6,000	0.15
E	8,000	0.10	4,000	0.10

Required:

Calculate the Expected Net Present Value of each of the projects. Which project is preferable?

(9 marks)