Unity University

Faculty of Distance and Continuing Education

Department of Management

Work sheet for **Mathematics for Management/Finance**

(Mgmt. 221/ACFN.221)

Name _____

Id No. _____

Department _____

Student Center _____

Program: Distance ☐

Regular / Extension ☐

This is a work sheet you are expected to do by your own. It carries 25 marks. The work sheet should be completed and submitted to your center coordinator which will be sent to the Head Office of the School of Distance and Continuing Education for evaluation. Do not try to complete the worksheet until you have covered all the lessons and exercises in the course material.

Any questions in the course that you have not been able to understand should be stated on a separate sheet of paper and attached to this work sheet. Your tutor will clarify for you.

After completing this worksheet, be certain to write your name, Id No and Address on the first page. In addition to this, *your Name and Id No should be written on each paper of the work sheet.*

***N.B:* This worksheet has 3 parts and 4 pages. Good work!**

Part I: Multiple choice (7.5 marks)
Choose the best answer and write the letter of your Choice on the answer sheet provided. (0.5 point each)

1. Which of the following in true about linear equation and its graph
   A. If its slope is positive, the graph is rising
   B. If it passes through the origin the X and Y intercept have positive value
   C. If its slope is undefined the graph is horizontal
   D. The slope can be calculated by dividing the change in X by the change in Y
2. The size of a matrix resulting from the product of matrices with sixe 8 by 6 and 6 by 9 is:
   A. 8 by 9 B. 9 by 8 C. 6by 8 D.9 by 9
3. Which of the following is correct?
   A. A matrix with size 1x7 is a column matrix
   B. A matrix with size 10x11 does not have inverse
   C. For matrix A and B ; A+B is defined if they have the same size
   D. If matric AxB is defined , AxB= BxA
4. A In a linear cost-output relationship ,the cost component that changes with the quantity of output is:
   A. Marginal profit B. Fixed cost C. variable cost D. all
5. Which of the following is constant throughout the analysis of Markov chain model?
   A. Initial probability C. Steady state
   B. Transitional probability D. Long run forecast
6. If the fixed cost and per unit cost of producing product "P" respectively are birr 90,000 and birr 50, assuming linear cost-output relationships what will be the average cost of 200 unit?
   A. Birr 250 B. Birr 450 C. Birr 500 D. Birr 900
7. If a salesperson earns weekly salary and a commission of 5% of sales , and If her total income and sales for a particular week respectively were birr 40,000 and 600,000 , the weekly salary of the salesperson would be Birr_____.
   A. 5,000 B. 10,000 C. 40,000 D.50,000

8. XYZ retail store has planned to work on a margin of 48%. The other variable cost to be incurred by the retail store estimated to 8% of sales. Fixed cost is expected to be 200,000. If profit is expected to be birr 120,000, what would be the expected sales?

   A. 571, 429 B. 967,200 C. 727,273 D. 800 000

9. Fixed values that specifies the impact that one unit of decision variables will have on objective function and any constraint of linear programming is

   A. Model structure C. Parameters

   B. Model assumption D. Model validity

10. Solution to linear programming model can assume fractional values .These assumption is

    A. Linearity B. certainty C. divisibility D. Proportionality

11. Which of the following is **NOT** a property of linear programming problems?

    A. The presence of restrictions

    B. Optimization of some objective

    C. One course of action

    D. Usage of only linear equations and inequality

12. Which of the following statement is not correct concerning Breakeven Analysis?

    A. Keeping other variables constant decline in unit variable cost leads to diminish in breakeven quantity

    B. Increase in selling price leads to increase in breakeven quantity when other variables kept constant

    C. Break-even point is the point at which there is no loss or profit and expressed in terms of production quantity and revenue level

    D. Keeping other variables constant increase in fixed cost leads to increase in breakeven quantity

13. How long it will take to double in value a given sum of money at 5% simple interest

    A. 5 years B.10years C. 15 years D.20 years

14. In 2 years you are to receive $50,000.If the interest rate were to suddenly decrease, the present value of that future amount to you would be:

    A. Rise B. Fall C. Constant D. None

15. If $Z = 400X_1 + 100X_2$ (Profit) and If the optimal solution is (60, 40) the value of objective function (Zmax) equals

    A. 2,200 B. 50,000 C.28,000 D.50,000

Part II: Matching (5 marks)

Match column A with correct answer under column B and Write the letter of your answer on the answer sheet provided (0.5 points each)

Column A	Coleman B
1. Total income equals total payment	A. Constraints
2. Equal periodic deposit at the end of each period	B. Parameter
3. Amount of unused resource at optimal point of LPP	C. Markov chain
4. Limits attainability of objectives	D. Breakeven point
5. Probabilistic forecasting model	E. Ordinary annuity
6. Linear programing problem (LPP)	F. Annuity due
7. Addition value of one more unit of resource	G. Parameters
8. A constraint that assume zero or more value	H. Non negativity constraint
9. Have per unit impact on decision variables	I. Additivity
10. Fractional values are acceptable as solution in LPP	J. Proportionality
	K. Divisibility
	L. Marginal value
	M. Differential calculus
	N. Constrained optimization
	O. Slack
	P. System constraint
	Q. Surplus

Name _____ID_____

Part I: Multiple choice

1_____	6_____	11
2_____	7_____	12_____
3_____	8_____	13_____
4_____	9_____	14_____
5_____	10_____	15_____

Part II: Matching

1_____	6_____
2_____	7_____
3_____	8_____
4_____	9_____
5_____	10_____

Part III Work out (12.5 Marks)

Attempt the following problems on a separate sheet of paper and mail for correction.

Write your name and Id number on the attached paper

Problem 1: Is the number of unit produced(X) increase from 40,000 to 60,000 units, production cost(Y) increase from birr. 80, 000 to 120,000, assuming linear relationship:

a) develop the equation the relationship(**1.5 pts**)

b) what will be the total cost if there is not production (**1pt**)

Problem3: A manufacturer has production facilities for producing two different products. Each of the products requires three different operations: grinding, assembly and testing. The per unit resource requirement of each is summarized below

Operations	Per unit requirement (minuets)		
	A	B	Available (minutes)
Grinding	6	5	900
Assembly	10	20	600
Testing	5	30	900
Profit per unit	$120	$180	

Required: Formulate this problem as a linear programming model and find the optimal solution

a) using graph(**10 pts**)