NATIONAL OPENUNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESS WAY, JABI – ABUJA
FACULTY OF MANAGEMENT SCIENCES
DEPARTMENT OF FINANCIAL STUDIES
2019_1 EXAMINATION

COURSE CODE: MBF839 **CREDIT UNIT: 3**
COURSE TITLE: QUANTITATIVE TECHNIQUES FOR BANKING & FINANCE
TIME ALLOWED: $2^{1/2}$HRS
INSTRUCTIONS:
1. Attempt Question One (1) and any other three (3) questions
2. Question 1 carries 25 marks, while the other questions carry 15 marks each.
3. Present all points in coherent and orderly manner

(1) A company is engaged in the production of two products which are processed through three departments. The number of hours required to finish each product are given below:

	Products		Maximum Hours Available/Month
	A	B	
Department			
I	7	8	1600
II	8	12	1600
III	10	16	1600

(a) Formulate this problem in linear programming form. **(2½ Marks)**

(b) If the profit of the products is ₦60 per unit of A and ₦40 per unit of B, what quantities per month should be planned to maximize profit? **(18½ Marks)**

(c) Capacity can be increased in one department only. In which department should it be done and why? **(4 Marks)**

(2) The table given below has been taken from the solution procedure of a transportation problem involving minimization of costs in naira.

From \ To	X	Y	Z	Supply
A	31 [4]	25 [8]	0 [8]	56
B	41 [16]	0 [24]	41 [16]	82
C	0 [8]	77 [16]	0 [24]	77
Demand	72	102	41	215

(a) Is the solution optimal? If not find an optimal solution. **(10 Marks)**
(b) Does the problem have multiple solutions? Give reasons. If so, find one more optimal solution. **(5 Marks)**

(3) A small project consists of seven (7) activities for which the relevant data is given below:

Activity	Preceding activities	Time duration (days)
A	-	4
B	-	7
C	-	6
D	A,B	5
E	A,B	7
F	C,D,E	6
G	C,D,E	5

(a) Draw the network of the project and identify the activity paths in the project. **(6 Marks)**
(b) Calculate the time schedule, including the slack time of the activities of the project. **(6 Marks)**
(c) What is the project completion time and what are the critical activities? **(3 Marks)**

(4) A company is considering change of supplier for coupling hardware. Presently, the company has an optimal purchasing policy with Kola Hardware at a discount of 1%. The yearly purchases are 81,000 units at the purchase price of ₦1. The ordering cost is ₦125 per purchase and the carrying charges are 25% of the average inventory level. Bids received from other suppliers are: (1) New Hardware offers 5% discount if ordered twice a year and Biggy Supplies company offers 3% discount if ordered four (4) times a year. Should the company retain the present supplier or accept the proposed and if so, which offer? **(15 Marks)**

5) The following information relates to a regression analysis to determine the effect of family Income (X) on family Consumption (Y) with data taken from ten families.

$EX_iY_i = 205,500$ $Ex_iy_i = 16,800$ $EY_i = 1110$ $EX_i = 1700$

$EX_i^2 = 322,000$ $Ey_i^2 = 8890$ $Ex_i^2 = 33,000$ $N = 10$

HINT: ANOVA TABLE

Source of Variation	SS	df	MSS
Regression	$b_2^2\ Ex_i^2$	$k - 1$	SS/df
Residual	Eu_i^2	$N - k$	SS/df
Total	Ey_i^2	$N - 1$	

N is number of observations and k is number of parameter estimates including the intercept

(a) Compute the regression coefficients b_1 and b_2 in the following model:

$$Y_i = b_1 + b_2X_i + u_i$$

(b) Compute the Total Sum of Squares (TSS). **(15 Marks)**

6a) An investor expects to get ₦5.50 as dividend from a share next year and hopes to sell the share at ₦45 after holding it for one year. How much should the investor pay for the share if the risk premium on the share is 15 per cent and the yield on treasury bill is 12 per cent. **(5 Marks)**

6b) An investor expects to get ₦13.50; ₦14; ₦14.50 as dividend from a share during the next three years and hopes to sell it off at ₦175 at end of the third year. If the investor has a required rate of return of 35 per cent on the share, how much should the investor pay for the share? **(5 Marks)**

6c) A company has declared a dividend of ₦12.50 for the current year. The company has been following the practice of enhancing its dividend by 10 per cent every year and is expected to continue this policy in the future. What is the intrinsic value of the share if the market expects a rate of return of 15 per cent on the share? If the share sells for ₦160, would you buy it? Why or Why not? **(5 Marks)**