CRAWFORD UNIVERSITY

FAITH CITY, IGBESA

COLLEGE OF BUSINESS AND SOCIAL SCIENCES
2014/2015 SESSION
HARMATTAN SEMESTER EXAMINATION.
COURSE: QUANTITATIVE TECHNIQUES

COURSE CODE: FIN 405
TIME ALLOWED: 2 HOURS 15 MINUTES
INSTRUCTION: SECTION A IS COMPULSORY.
SECTION A

1. (a) Use the simplex method to solve the linear programming problem:

   Objective function : Max Z = 10X + 30Y

   Constraints:

   Machine A hr $4X + 6Y \leq 12$

   Machine B hr $8X + 4Y \leq 16$ 15marks.

   (b) A chemical firm produces automobile cleaner X and polisher Y and realizes =N=10 profit on each batch of X and =N=30 on Y . Both products require processing through the same machines, A and B but X requires 4 hours in A and 8 hours in B, whereas, Y requires 6 hours in A and 4 in B. During the forthcoming week machines A and B have 12 and 16 hours of available capacity respectively. Assuming that demand exists for both products, how many batches of each should be provided to realize the optimal profit. 10marks.

25MARKS

SECTION B

INSTRUCTION: ANSWER QUESTION 1 AND ANY OTHER TWO.

1) A company is considering whether to launch a new product. The success of the idea depends on the ability of a competitor to bring out a competing product (estimated at 60%) and the relationship of the competitor's price to the firm's price.
   Table A: Shows the profits for each price range that could be set by the company related to the possible competing prices:

Table A

Profits in =N='000

If Competitor's Price is

If Company's Price is:	Low	Medium	High	Profit if no competitor
Low	60	84	90	100
Medium	68	90	98	140
High	20	60	106	180

The company must set its price first because its product will be on the market earlier so that the competitor will be able to react to the price.

Estimates of the probability of a competitor's price are shown in Table B.

Table B

If Company's Prices are:	Competitor's Price Expected to be Low	Medium	High
Low	0.80	0.15	0.05
Medium	0.20	0.70	0.10
High	0.05	0.35	0.60

a) Draw a decision tree and analyse the problem.

b) Recommend what the company should do.

15MARKS

2. A scheduler has four jobs that can be done on any of four machines with respective times (minutes) as shown in the table below. Determine the allocation of jobs to machines that will result in minimum time.

Job	Machine 1	2	3	4
A	5	6	8	7
B	10	12	11	7
C	10	8	13	6
D	8	7	4	3

3. (a) Define modeling and classify models according to their degree of abstraction. 10mks

(a) List the steps in using models to solve problems. 5mks

15MARKS

4. (a) A manufacturing company demands 50,000 units of stock amount. The cost per order is =N=1,000 while it cost =N=100 per unit of inventory. If annual inventory holding rate is 25% of the inventory, Calculate:

i) The optimal quantity ordered.

ii) The number of orders

iii) The total variable cost.

iv) The total cost. 8mks

b) Draw the network for the following problem;

Activity	Preceeding Activity.
1	-
2,3,4	1
5	2
6	3
7	5
8	6
9	7,8
10	3
11	4
12	9,10,11

7 marks.

15 MARKS

5. Explain comprehensively the concept of "Queuing Theory". **15 MARKS.**