UNIVERSITY REGULAR EXAMINATIONS

2012 2013 ACADEMIC YEAR

FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION

COURSE CODE: MBA 805

COURSE TITLE: TECHNOLOGY & OPERATIONS MANAGEMENT

DATE: 21st August, 2013   **TIME:** 2:00p.m. – 5:00p.m.

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Instructions to Candidates.

Attempt any four questions.

QUESTION ONE

A wholesaling company has three warehouses from which supplier are drawn for four retail customers.   The following company deals in a single product, the suppliers of which at each warehouse are:

Warehouse No.	Supply (Unit)
I	20
II	28
III	17

Customer No	Demand (Units)
A	15
B	19
C	13
D	18

Conveniently total supply at the warehouse is equal to total demand from the customers. The table below gives the transportation costs per unit shipped from each warehouse to each customer.

		CUSTOMER			
		A	B	C	D
WAREHOUSE	I	3	6	8	5
	II	6	1	2	5
	II	7	8	3	9

   i.   Determine the supplies to dispatch from each of the warehouses to each customer so as to minimize overall transportation cost (Use least cost method) (8 marks)

  ii.   Check for the optimality, in the solution obtained above (i)   (17 marks)

QUESTION TWO

Alpha manufacturing incorporation has an opportunity to improve its production processes. The following table gives the activities and other relevant data for the project.

Activity	immediate Predecessor	Normal time (days)	Crash time (day)	Normal cost (ṭ)	Crash Cost (ṭ)
A	-	4	3	600	800
B	A	2	2	400	400
C	B	5	4	750	900
D	C	7	5	400	600
E	B	7	6	700	1000
F	E	2	1	500	650
G	D, F	5	4	600	850
H	E	6	2	500	900
I	H	8	3	600	800
J	G, T	7	6	670	850
K	J	5	3	640	650

In addition to the above cost figures there are ṭ 80 indirect costs per day during the project

(a) Using normal duration determine the total Overal cost for the project and its duration   (10 marks)
(b) Find the project duration that will minimize the total cost of the project (13 marks)
(c) Determine the total cost of completing the project in shortest possible time.
                                                                                   (2 marks)

QUESTION THREE

i.   A maintenance facility (Service) has a poisson arrival rates, negative exponential service times and operates on a first come first served queue discipline. Background occurs on an average of three per day with a range of zero to eight. The maintenance crew can service on an average six machines per day with a range of zero to seven.

Determine

(i)   Utilization factor of the service facility   (2 marks)
(ii)   Mean time in the system   (2 marks)
(iii)   Mean number in the system in break-down or repair   (2 marks)
(iv)   Mean waiting time in the queue   (2 marks)
(v)   Probability of finding two machines in the system   (2marks)

    (vi)   Expected number in the queue   (2 marks)

(b) The total quality management , just in time and computer integrated manufacturing are the core –modules of world class manufacturing that can be adapted to any specific manufacturing industry or enterprise . Using well articulated examples, the following structural components of Total quality management.

    i.   Design standardization   (4 marks)
    ii.   Quantity function deployment (GFS)   (5 marks)

QUESTION FOUR.

A company is engaged in the production of three products A, B and C. Products A and B are processed in three operations I, II and III, whereas product C is processed in operation I and II only. The maximum capacities of operations per week of 80 hours respectively. The times required to produce one item in each of the operations are given below:

Operations	Time(hrs) required to produce one unit		
	A	B	C
I	3	1	2
II	1	4	1
II	2	3	0

Profit (ț) per unit of A, B and C is ț 10, ț12 and ț8 respectively, find the opimum production of A, B and C so as to maximize profit   (15 marks)

(b) Given the pay off matrix for player A, Obtain the optimum strategies for both the players and determine the value of the game   (10 marks)

                Player B

Player A $\begin{bmatrix} 6 & -3 & 7 \\ -3 & 0 & 4 \end{bmatrix}$

QUESTION FIVE

    (a) Patel found Products ltd what to determine how many kilograms of "shrikhand" to flock on daily basis. Historical data has generated the following pattern of demand

Units sold per day   180   181   182   183   184   185   186

Numbering days   2   8   10   40   20   15   5

Assume that the stock levels are restricted to the range 180-186 kgs and that shrikhand left unsold at the end of the day must be disposed off due to inadequate refrigeration facilities. Shrihand cost ț6 per kg to the company and its soils for ț 8 per kg.

(i)   Construct a conditional pay off table, and advice the management , how much
        the should order and stock using
        - Maximum approach (8 marks)
        -Expected monetary value approach (12 marks)

(b) Highlight the major rules of drawing a project network (5 marks)