TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
(BSIT J12/FT)

BIT 2212: BUSINESS SYSTEM MODELLING

END OF SEMESTER EXAMINATION
SERIES: APRIL 2013
TIME: 2 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer Booklet*

This paper consists of **FIVE** questions. Attempt question **ONE** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One (Compulsory)

a) Explain the advantages and limitation of business system modeling. **(10 marks)**

b) Explain how operation research could be used to model business system solution. Show the approach. **(10 marks)**

c) What kinds of models are built to solve business operations problem. **(10 marks)**

Question Two

a) A manufacture of sheet polythene has 2 plants, one located in Salt Lake City and the one located in Salt Lake City and the one located in Dewier there are 3 distributing warehouses, one in Los Angeles and another in Chicago and the third in New York city. The Salt Lake City plant can supply 120 tonnes of the product per week whereas the Dewier plant can supply 140 tonnes per week.
The Los Angeles warehouse needs 100 times weekly to meet its demand. The Chicago warehouse needs 60 tonnes weekly and the New York City warehouse needs 80 times weekly. The following table gives the shipping cost (in dollar) per tone of the product.

	To Los Angeles	**Chicago**	**New York City**
From Salt Lake City	5	7	9
Denver	6	7	10

Required:

Formulate a L.P. Model for the above problem which will enable you to determine the number of tonnes of polythene which should be supplied from each plant to each warehouse to minimize the total shipping cost while meeting the demand. **(12 marks)**

b) With the help of an example briefly discuss, any **TWO** statistical forecasting techniques and any **TWO** judgments forecasting methods. **(8 marks)**

Question Three

a) The cost of transportation from a plant to the distribution centre has been displayed in the following table:

Plant	1	2	3	4	5	Supply
1	20	25	27	20	15	40
2	18	21	22	24	20	70
3	19	17	20	18	19	90
4	0	0	0	0	0	30
Demand	30	40	60	40	60	230

Required:

(i) Formulate the above transpatch problem as an HP problem.
(ii) Use North West Corner Rule to find the Optimal solution to the above problem
(iii) Use least cost method to solve the above problem. **(20 marks)**

Question Four

a) A works manager has to allocate four different jobs to four workmen. Depending on the efficiency and the capacity of individual the times taken by each differ as shown the table below. How the tasks should be assigned one job to a worker so as to minimize the total man-hour. **(10 marks)**

	WORKERS			
Job	A	B	C	D
1	10	20	18	14
2	15	25	9	25
3	30	19	17	12
4	19	24	20	10

b) Consider the project of building a house. The details of the project activities are tabulated. Draw the network diagram. **(10 marks)**

Activity	A	B	C	D	E	F	G	H	I	J	K
Immediate Present		A		B,C	C	G,H	D	B	F	G	E,I,J

Question Five

Each of the three alternative projects below involve an initial cost of 1 million and produce net case flow as shown:

PROJECT	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
A	0m	0.5m	0.5m	0.5m	0.5m
B	0.5m	0.5m	0.5m	0m	0m
C	0m	0m	0.5m	1m	1m

Required

(i) Calculate the payback period for the 3 projects
(ii) Calculate the average rate of return for the above 3 projects
(iii) Calculate the net present value for the above 3 projects
(iv) Which one will you choose and why? **(20 marks)**