

**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

# **UNIVERSITY EXAMINATIONS 2014/2015**

**THIRD YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF BUSINESS INFORMATION TECHNOLOGY**

**BIT 2212 : BUSINESS SYSTEM MODELING**

**DATE: AUGUST 2014 TIME: 2 HOURS**

**INSTRUCTIONS:**

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**QUESTION ONE**

1. Identify the various steps in decision making [6 marks]
2. List three types of decision making environments [3 marks]
3. From the following table, calculate EMV (expected monetary value) [5 marks]

Probability of 0.5

Table 11

|  |  |  |
| --- | --- | --- |
| Alternative | Favorable market | Unfavorable market |
| Construct a large plant | 200 000 | -100 000 |
| Construct a small plant | 100 000 | -20 000 |
| Do nothing | 0 | 0 |

1. Identify five mathematical models. [5 marks]
2. A company plans to make two products : Chairs and tables from its available resources which consist of 400 board feet timber and 450 man hours of labour. To make a chair requires 5 board feet and 10 man hours and yields a profit of shs. 45 while each table uses 20 board feet of 15 man hours and has a profit of shs. 80. Formulate the objective function and the constraint. [6 marks]
3. A company has a current transportation schedule which is being questioned. The firm has three factories and five warehouses. The data presented below provides the factory capacities and warehouse requirements. Find the initial solution to the problem of the company using Vogels Approximation method (VAM) [5 marks]

Table 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Warehouse | A | B | C | Warehouse  requirements |
| 1 | 50 | 40 | 80 | 400 |
| 2 | 80 | 70 | 40 | 400 |
| 3 | 60 | 70 | 60 | 500 |
| 4 | 60 | 60 | 60 | 400 |
| 5 | 30 | 50 | 40 | 800 |
| Factory availability | 800 | 600 | 1,100 | 2500 |

**QUESTION TWO**

1. Identify five characteristics of a linear programming [5 marks]
2. Use simplex procedure to solve the linear programming below

Max 45x+80y

Subject to:





 [15 marks]

**QUESTION THREE**

1. Outline four characteristics of an assignment model [4 marks]
2. Determine the best assignment for the following information

Table 3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 |
| A | 3000 | 2500 | 3300 | 2600 | 3100 |
| B | 3500 | 3000 | 2800 | 2800 | 3300 |
| C | 2800 | 2900 | 3900 | 2300 | 3600 |
| D | 3300 | 3100 | 3400 | 2900 | 3500 |
| E | 2800 | 3500 | 3600 | 2900 | 3000 |

[16 marks]

**QUESTION FOUR**

1. Outline five PERT conventions [5 marks]
2. Given the following activities and their time estimations answer the questions that follow:

Table 4

Activity time (Month)

A m b

1 – 2 3 6 15

1 – 6 2 5 14

2 – 3 6 12 30

2 – 4 2 5 8

3 – 5 5 11 17

4 – 5 3 6 15

6 – 7 3 9 27

5 – 8 1 4 7

7 – 8 4 19 28

Required:

1. Draw the network diagram a determine the project duration of its standard deviation.
2. If the project manager has given a promissory data of 42 months, what is the probability of meeting this deadline.
3. The project manager has given a delivery data with a 95% . chance, how early should the project start [15 marks]