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**JOMO KENYATTA UNIVERSITY**

**OF**

**AGRICULTURE AND TECHNOLOGY**

 **UNIVERSITY EXAMINATIONS 2014/2015**

**YEAR II SEMESTER II SPECIAL/SUPPLIMENTARY EXAMINATION FOR THE DEGREE OF BACHELOR OF SUPPLY CHAIN MANAGEMENT AND BACHELOR OF PURCHASING AND SUPPLIES MANGEMENT**

**HBC 2205/HPS 2210: QUANTITATIVE TECHNIQUES/METHODS II**

**DATE: AUGUST 2015 TIME: 2 HOURS**

**INSTRUCTIONS: THE PAPER CONSISTS OF FIVE QUESTIONS QUESTION ONE IS COMPULSORY ATTEMPT ANY OTHER TWO QUESTIONS**

**QUESTION ONE**

1. Clearly explain the following:
2. The requirements of a matrix to have an inverse matrix [2 marks]
3. The main property of an inverse matrix [2 marks]
4. The procedure followed in order to calculate the inverse of a 3x3 matrix [6 marks]
5. Name and clearly explain the main TWO branches that calculus is divided into, [8 marks]
6. The Sales Manager of some firm wishes to study the characteristics of revenue received. He notices that at a price of Shs.12 the level of output sold is 40 units. However when the price goes up to Shs.20, the quantity sold is 8 units. Assuming a linear relationship between the function, determine;
7. Total revenue function [4 marks]
8. Average revenue function [4 marks]
9. Marginal revenue function [4 marks]

 [Total: 30 marks]

**QUESTION TWO**

1. Calculate from the data below:
2. The population mean [4 marks]
3. The grand mean [4 marks]

Sample Heights

1 300 320 310 290 336

2 284 290 260 240

3 270 284 264 272

4 280 260 256 250

(b) Two markets Coca and Pepsi, share the market 60% and 40% respectively. Each month some brand switching takes place. Out of those who bought Coca last month 70% buy it again 70% buy Pepsi; out of those who bought Pepsi last month 60% buy it a while 40 % switch to Coca.

**Required:**

Work out the market share for the 3rd month from now. [12 marks]

**QUESTION THREE**

1. Define regression [2 marks]
2. The following information relates to XYC Ltd.

Year Sales (Kshs.’000’)

1. 2400
2. 3200
3. 3000
4. 3600
5. 3500
6. 4000
7. 4200
8. 4100
9. 3800

**Required:**

1. Calculate the line of best fit [8 marks]
2. Calculate the amount of sales it is;
3. 17 years [2 marks]
4. 20 years [2 marks]
5. Co-efficient of determination can be calculated using two different methods. State clearly the two methods (formulae) [4 marks]

**QUESTION FOUR**

1. Clearly differentiate the TWO types of hypothesis. [4 marks]
2. A machine that fills a bottle into the bottles with a capacity of 200 ml. A random sample of 36 bottles is and the mean amount of the liquid in the bottles was found to be 212 ml with a standard deviation of 30 ml. You are required to conduct a significance test at 5% level. [7 marks]
3. Explain the TWO main applications of the Mark ovian process in the business World. [4 marks]
4. Differentiate between a Scalar matrix and a transpose matrix. [5 marks]

**QUESTION FIVE**

Using the inverse method, solve the following;

 6x + 4y + 2z = 28

 8x + 2y + 6z = 32

 12x + 6y + 10z = 40 [20 marks]