



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF HUMANITIES AND SOCIAL SCIENCES

DEPARTMENT OF HOSPITALITY & TOURISM MANAGEMENT

UNIVERSITY EXAMINATION FOR THE:

DIPLOMA IN TOURISM MANAGEMENT (DTM S18)

BAC 2201: QUANTITATIVE TECHNIQUES

END OF SEMESTER EXAMINATION

SERIES: AUGUST 2019

TIME: 2 HOURS

DATE: Pick Date Aug 2019

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

SECTION A (Answer all the questions)

30 POINTS

QUESTION ONE

- a) Distinguish between Holding cost and Stock out cost giving clear examples. (4 marks)
- b) Explain FIVE applications of index numbers. (10 marks)
- c) Solve the following simultaneous equations. (10 marks)
- i) $x + 2y = 5$
 $3x - 4y = 25$
- ii) $2x + 3y = 11$
 $x + 2y = 7$

- d) A teacher selects a random sample of 56 students and records, to the nearest hour, the time spent watching television in a particular week. Fill in the class midpoints and class widths. (6 marks)

Hours	1–10	11–20	21–25	26–30	31–40	41–59
Frequency	6	15	11	13	8	3
Mid-point						
Class width						

SECTION B (Answer only TWO questions)

QUESTION TWO

- a) Highlight five assumptions of the Cost Volume Profit analysis. (5 marks)
- b) Highlight five assumptions behind the determination of Economic Order Quantity (EOQ). (5 marks).
- c) The following information was extracted from the books of Esos Ltd regarding the stock of material xyz.

Consumption

Maximum	1,200 units/day
Minimum	800 units/day
Normal	900 units/day
Minimum Re-order period	12 days
Maximum Re- order level	24 days
Reorder period	18 days
Re-order quantity	32,000 units

Required: Work out

- i) Re-order level. (4 marks)
- ii) Minimum stock level. (3 marks)
- iii) Maximum stock level (3 marks)

QUESTION THREE

a) Perform the indicated operations:

i. $(A)+(B)$ Given: $A = \begin{pmatrix} 4 & -3 & 6 \\ -8 & 5 & -9 \end{pmatrix}$ $B = \begin{pmatrix} -5 & 6 & -2 \\ 3 & 7 & -4 \end{pmatrix}$ (2 marks)

ii. $(A)-(B)$ Given: $A = \begin{pmatrix} 6 & -7 \\ -4 & 5 \\ -3 & 2 \end{pmatrix}$ $B = \begin{pmatrix} -8 & 3 \\ 3 & -1 \\ 2 & -8 \end{pmatrix}$ (2 marks)

iii. $(A)(B)$ Given: $A = \begin{pmatrix} 6 & -2 & 3 \\ -4 & 2 & 5 \end{pmatrix}$ $B = \begin{pmatrix} 2 & -3 \\ 4 & -5 \\ 1 & -6 \end{pmatrix}$ (2 marks)

iv. Find the determinant of $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ (4 marks)

b) The function $p = x^3 - 18x^2 + 105x - 88$ shows the way the profit per item made, p , depends on x , the number produced in thousands.

Find the maximum and minimum values of p .

(10 marks)

QUESTION FOUR

The weights, in kg, of 1500 bags are summarized in the table below.

Weight (kg)	Midpoint, x kg	Frequency, f
0.0 – 1.0	0.50	1
1.0 – 2.0	1.50	6
2.0 – 2.5	2.25	60
2.5 – 3.0		280
3.0 – 3.5	3.25	820
3.5 – 4.0	3.75	320
4.0 – 5.0	4.50	10
5.0 – 6.0		3

a) Write down the missing midpoints in the table above.

(2 marks)

b) Calculate an estimate of the mean weight.

(5 marks)

c) Calculate an estimate of the standard deviation of the weight. (5 marks)

d) Use interpolation to estimate the median and the interquartile range weight (8 marks)

QUESTION FIVE

A company manufacturing a product known as TX uses five components in its assembly. The quantities and prices of the components used to produce a unit of TX in 2016, 2017 and 2018 are tabulated as follows.

COMPONENT	2016		2017		2018	
	Quantity	Prices	Quantity	Prices	Quantity	Prices
A	10	3.12	12	3.17	14	3.20
B	6	11.49	7	11.58	5	11.67
C	5	1.40	8	1.35	9	1.31
D	9	2.15	9	2.14	10	2.63
E	50	0.32	53	0.32	57	0.32

Required:

i) Calculate Laspyere's type price index number for the cost of one unit of TX for 2017 and 2018 based on 2016. (9 marks)

ii) Calculate Paasche type price index numbers for the cost of one unit of TX for 2017 and 2018 based on 2016. (9 marks)

iii) Compare and contrast the Laspeyre and Paasche price-index numbers you have obtained in (i) and (ii) (2 marks)