BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF COMMERCE

DEPARTMENT OF ECONOMICS

PROGRAMMES: BCOMM SUPPLY CHAIN MANAGEMENT

SCM 107: MATERIALS PLANNING AND PRODUCTION CONTROL

DURATION: 3 HOURS

INSTRUCTIONS:

1. Answer any FOURquestions.
2. Each question carries 25 marks.
3. NO CELLPHONES ALLOWED IN THE EXAMINATION ROOM.

Question 1

a) Zvihuta Pataundi cooperative grows Zvihuta in Harare. Because of increasing demand they seek to expand and are considering various locations. The table below shows their market for eggs.

Market	Crates of eggs	coordinates
Budiriro	288	(11,15)
Kuwadzana	133	(14,6)
Glen View	367	(7,10)
Mufakose	123	(18,18)
Glen Norah	77	(15,7)
Marimba	42	(9,13)

i. Calculate centre of gravity for the cooperative. **(5 marks)**

ii. Show the load distance score off the centre of gravity for the cooperative. **(5 marks)**

b) Briefly discuss any five dominant factors in facility location for a manufacturing firm highlighting how these may differ from a service rendering firm. **(14 marks)**

Question 2

a) The following information is available regarding annual fuel usage for a small manufacturing firm from 2013 to 2022

Year	Annual fuel usage (litres)
2013	441
2014	516
2015	641
2016	493
2017	491
2018	612
2019	714
2020	808
2021	566
2022	457

i. Compute a 3 year moving average forecast for the years 2017 to 2023. **(7 marks)**

ii. Calculate the forecast errors for the years 2017 to 2023. **(5 marks)**

iii. Using an exponential smoothing coefficient $\alpha = 0.10$, calculate the exponential smoothing coefficient forecast for 2023. **(6 marks)**

b) Explain situations in which qualitative forecasting methods may be superior to quantitative forecasting. **(7 marks)**

Question 3

Tinosona Sewing Club in Murehwa supply school uniforms for schools in its locality. It seeks to divide its stock keeping units into 3 classes as informed by their value and usage. The table below show items kept as well as their value and usage;

SKU no:	Description	Quantity/yr	Unit value
1	Buttons	556 3341	0.02
2	Sewing thread	1470	1.81
3	Laces	440	3.20
4	Cloth	43 070	5.17
5	Pins	663	0.67
6	Elastics	5620	2.17

a) Carry out the ABC classification for Tinosona Sewing Club and draw the ABC polygon that corresponds with the classification. **(11 marks)**

b) To what extent do you think ABC analysis is reasonable inventory management tool? Support your view. **(4 marks)**

c) You are told that the club's annual cost of goods sold is 8765000, Calculate the following inventory measures for the club;

- **i.** Average aggregate inventory value **(4 marks)**
- **ii.** Weeks of supply **(3 marks)**
- **iii.** Inventory turnover **(3 marks)**

Question 4

Mimi poultry farm situated in Marondera find it economical to produce its chicken feed internally in its milling department. The mill however, uses old technology such that it can only produce 417kgs of feed per hour and it is recommended that it could not operate for more than 8 hours in every 24hr period. It operates 311 days every year. Average feed consumption per day is 41 bags of 50kgs each. The milling department requires $481 to set up the mill once it is stopped for period of time in excess of 1 day. A bag of feed is valued at $27 and annual holding cost is 23% of value of item held.

(a) Calculate the optimal lot size for the above farm and compare it with conventional lot sizing tools. **(7 marks)**

(b) **Calculate the maximum** cycyle inventory achievable for Mimi and explain why it is less than the lot size. **(5 marks)**

(c) Show why ELPS is always greater than EOQ. **(5 marks)**

(d) Calculate time between orders for the farm and sketch a graph to show the behaviour of both on hand inventory for this farm. **(8 marks)**

Question 5

a) Discuss any four major challenges in material planning for Zimbabwean firms. **(8 marks)**

b) In your opinion do you think Zimbabwean industries are ready for Just in Time inventory management system? **(8 marks)**

c) Explain situations where an organisation would prefer holding excess stock in its stores than to manage supplier relations. **(9 marks)**

END OF PAPER