

Operations Research – ODL

Assignment 1 – Due Thursday, April 27th , 2023

1. The Oaks of Mtandire Company owns a small furniture factory that produces both indoor and outdoor house furniture for wholesale distribution. Two basic raw materials, A and B, are used to manufacture the furnitures. The maximum availability of A is 32 tons a day; that of B is 36 tons a day. The daily requirement of the raw materials per ton of the indoor and outdoor furnitures are summarized in the following table:

Raw Materials	Outdoor	Indoor	Maximum Availability
A	2	4	32
B	4	2	36

A market survey has established that the daily demand for the indoor house furniture cannot exceed that of external furniture by more than 2 ton. The survey also shows that the maximum demand for indoor furniture is limited to 4 tons daily. The wholesale price per ton is MWK 300, 000 for outdoor furniture and MWK 200, 000 for indoor furniture.

Formulate a Linear Programming Problem

2. Ecobank is in the process of devising a loan policy that involves a maximum of \$12 million. The following table provides the pertinent data about available loans:

Type of loan	Interest rate	Bad-debt ratio
Personal	.140	.10
Car	.130	.07
Home	.120	.03
Farm	.125	.05
Commercial	.100	.02

Bad debts are unrecoverable and produce no interest revenue. Competition with other financial institutions dictates the allocation of at least 40% of the funds to farm and commercial loans. To assist the housing industry in the region, home loans must equal at least 50% of the personal, car, and home loans. The bank limits the overall ratio of bad debts on all loans to at most 4%.

Formulate a Linear Programming Problem.