

UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER

PROGRAMMES: BSc. Agric. Econ 2, BSc Agric. Econ 3 (Diploma Holders)

COURSE CODE: LUM 208

TITLE OF PAPER: POST-HARVEST TECHNOLOGY

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: PSYCHROMETRIC CHART

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO OTHER
QUESTIONS

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THE CHIEF INVIGILATOR**

QUESTION 1

a. Write short notes on the following grain drying systems;

- (i) Crib drying
- (ii) Sun drying
- (iii) Solar dryers
- (iv) Batch dryers
- (v) Continuous flow dryers

[15 marks]

b. Fifty tones of freshly harvested maize [moisture content 30% wet-basis] are to be dried in a bin drier with air at 45°C. Given that the ambient air conditions are;

Relative humidity = 30%

Dry-bulb temperature = 28°C

Airflow rate = 4.5m³/m²/s

Determine the moisture content of the dried maize if the drying air exhausts with humidity ratio of 15 g/kg dry air and drying proceeds for 8 hours. **[15 marks]**

c. Briefly discuss the various ways refrigeration can be accomplished for agricultural products. **[10 marks]**

QUESTION 2

a. Discuss Henderson's drying equation and explain as to how the relative humidity plays part in determining drying time. **[10 marks]**

b. Discuss the factors influencing the storage loss of food products at village level in Swaziland. **[20 marks]**

QUESTION 3

a. A bin full of oat is to be cooled with air at a dry bulb temperature of 22°C and an airflow of 30m³/min. If the ambient air conditions are 40°C dry-bulb temperature, and humidity ratio of 22 g of water per kilogram of air, determine;

- (i) The amount of heat to be removed per hour.
- (ii) The amount of water to be removed per hour by the cooling unit. **[20 marks]**

b. What are the major problems facing mechanical harvesters. Suggest some solutions to these problems. **[10 marks]**

QUESTION 4

a. Why do harvested products require conditioning and processing? **[10 marks]**

b. What factors would you consider in the selection of a grain cleaner? **[10 marks]**

c. List and discuss the factor you would consider in adopting a drying method. **[10 marks]**



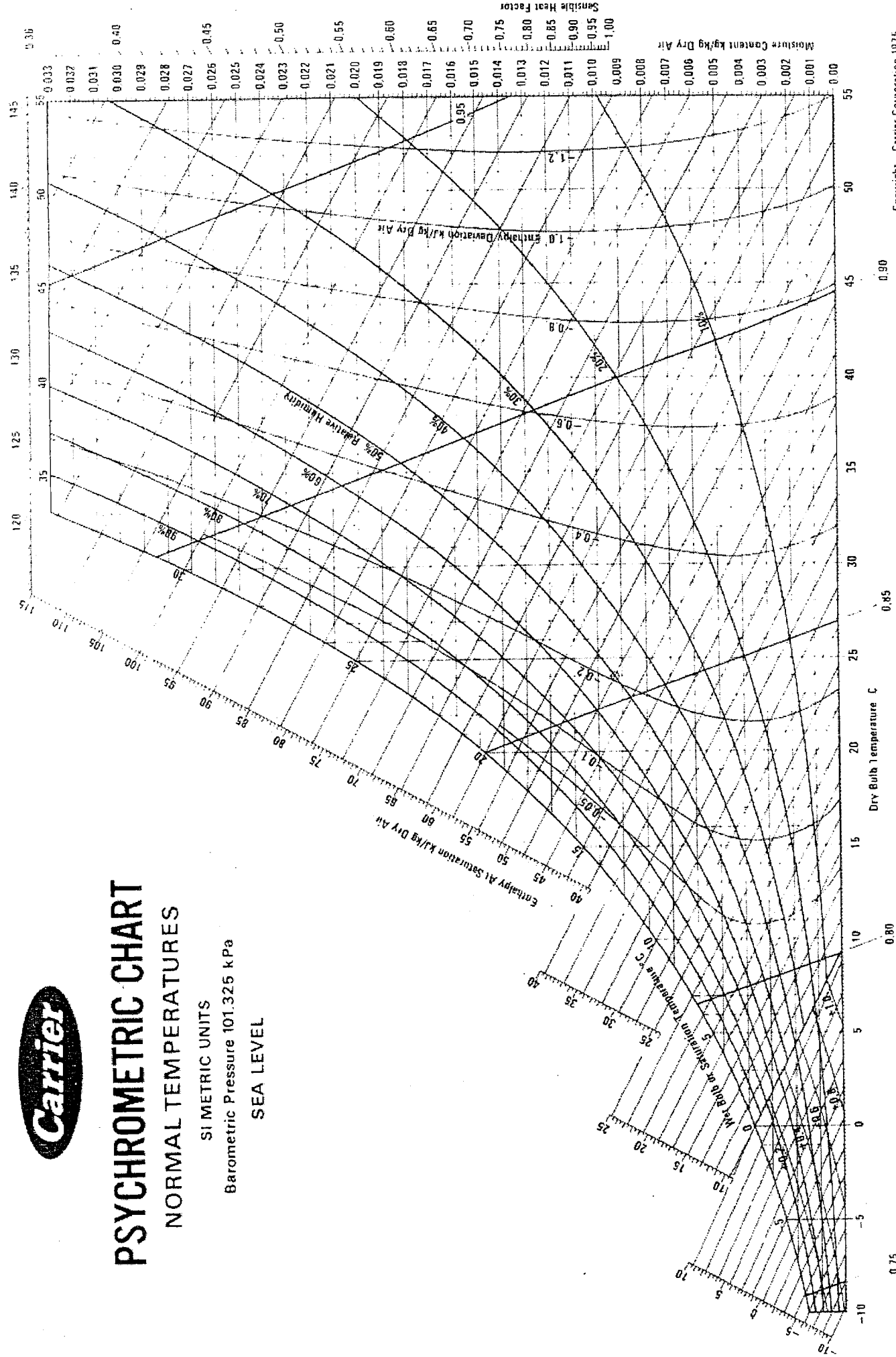
PSYCHROMETRIC CHART

NORMAL TEMPERATURES

SI METRIC UNITS

Barometric Pressure 101.325 kPa

SEA LEVEL



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Volume m³/kg Dry Air

0.80

0.75

Below 0°C Properties and Enthalpy Deviation Lines Are For Ice

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