

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

AGE 407

Department of Crop Science

Bachelor of Agricultural Science (Honours) Part IV Examination

Post-harvest Crop Management

3 HOURS (100 Marks)

INSTRUCTIONS

Answer any **FOUR** questions. Each question carries 25 marks.

1. Discuss post-harvest crop management at farm and national level. **[25 marks]**
2. (a) Define the term mycotoxin, **[2 marks]**
(b) Highlight the importance of aflatoxins in grain, **[8 marks]**
(c) Write notes on detection of aflatoxins in grain, **[5 marks]**
(d) Describe measures that can be taken to reduce the risk of aflatoxin contamination in groundnuts. **[10 marks]**
3. Discuss the most and least accurate methods for grain loss assessment. **[25 marks]**
4. (a) Define the term psychrometry. **[2 marks]**
(b) With the aid of diagrams explain;
 - (i) sensible heating and cooling, **[2 marks]**
 - (ii) why dew point temperature and humidity ratio are not independent states, **[2 marks]**
 - (iii) cooling with dehumidifying, **[3 marks]**

(iv) heating with humidifying, [3 marks]

(v) evaporative cooling. [3 marks]

(c) Use the psychrometric chart to complete the table below:

Tdb °C	Twb °C	Tdp °C	W Kg/kg	Enthalpy kJ/Kg	RH %	V m ³ /Kg
25					25	
	20		0.010			

[10 marks]

5. (a) Discuss factors to consider when designing a grain storage facility. [15 marks]

(b) With the aid of an equation, explain why grain respiration is a self-accelerating process towards deterioration. [10 marks]

6. Describe the following physical properties of grain and their importance in the post-production cycle:

(a) hygroscopic properties, [5 marks]

(b) dimensions, [5 marks]

(c) thermal conductivity, [5 marks]

(d) bulk density, [5 marks]

(e) angle of repose. [5 marks]

END OF PAPER