UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER

PROGRAMME:
B.SC IN AGRICULTURAL EDUCATION YEAR IV
B.SC IN AGRICULTURE YEAR IV (AEM & APH OPTIONS)

COURSE CODE: LUM 403

TITLE OF PAPER: FARM BUILDINGS AND STRUCTURES

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: NONE

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO OTHER QUESTIONS.

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QUESTION ONE: COMPULSORY QUESTION

a) Define or briefly explain the term, ventilation and discuss three functions it might be required to perform in a storage structure or livestock building. (10 Marks)

b) A livestock pen at the Teaching and Research Farm of the University of Swaziland has the following inside dimensions: - 50m long, 30m wide and an average height of 3.5m. The walls on the width sides are completely solid while for the length sides, the 2m at the bottom is solid and the top is finished with wire mesh. The environment where the structure is located has a temperature of 15°c and 50% relative humidity but for the animals housed not to be seriously affected, the required conditions within the structure are 30°c and 75% relative humidity. On a given day, the structure was used to house dairy cow, dairy calf, pigs and broilers the information of which are presented in Table 1

Table 1

Information on animals housed

A nimal	Weight (kg)	Moisture production g/h-animal	Sensible heat production watts/animal	Number of animals housed
Dairy cow	600	985	465	50
Dairy calf	300	450	215	75
Pig	90	170	120	90
Broiler	1.50	8	6.90	500

a) What is the total moisture produced in the building (5 Marks)

b) What is the amount of sensible heat produced (5 Marks)

c) What is the total heat produced (Given that latent heat equals moisture in g/h x 0.675Wh/g) (5 Marks)

d) Calculate the amount of dry air that will be required to remove all the moisture produced in the building. (10 Marks)

e) Calculate the amount of heat removed by ventilation (5 Marks)

QUESTION TWO

a) Briefly explain what you understand by farmstead planning. (5 marks)

b) Discuss two factors that should be taken into account when selecting a site for an agricultrural enterprise, pointing out their functions and methods of accomplishment. (10 Marks)

c) Efficient planning of farmstead must take into account a number of factors. Discuss two of such factors. (10 Marks)

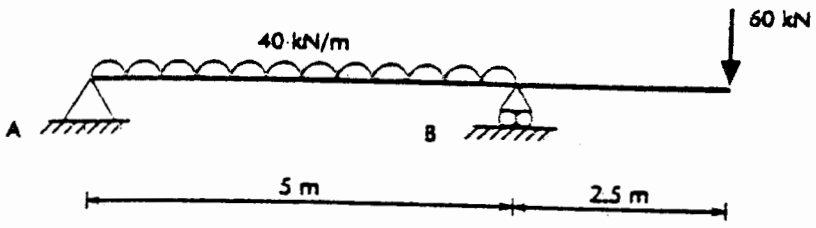
d) Assuming you were a large scale farmer, discuss one factor that may influence you in making your farm a residential one. (5 Marks)

QUESTION THREE

a) Briefly explain what you understand by the followings with respect to loading:
   i) Dead and live load
   ii) Load duration
   iii) Load modification factors (6 marks)

2005) Define the following properties of materials:
   (i.) Strength;
   (ii.) Stiffness;
   (iii.) Yield strength;
   (iv.) Ultimate strength. (8 Mark

Calculate the support reactions for the beam in the figure below, which rests on ned and roller supports. (16 Marks)



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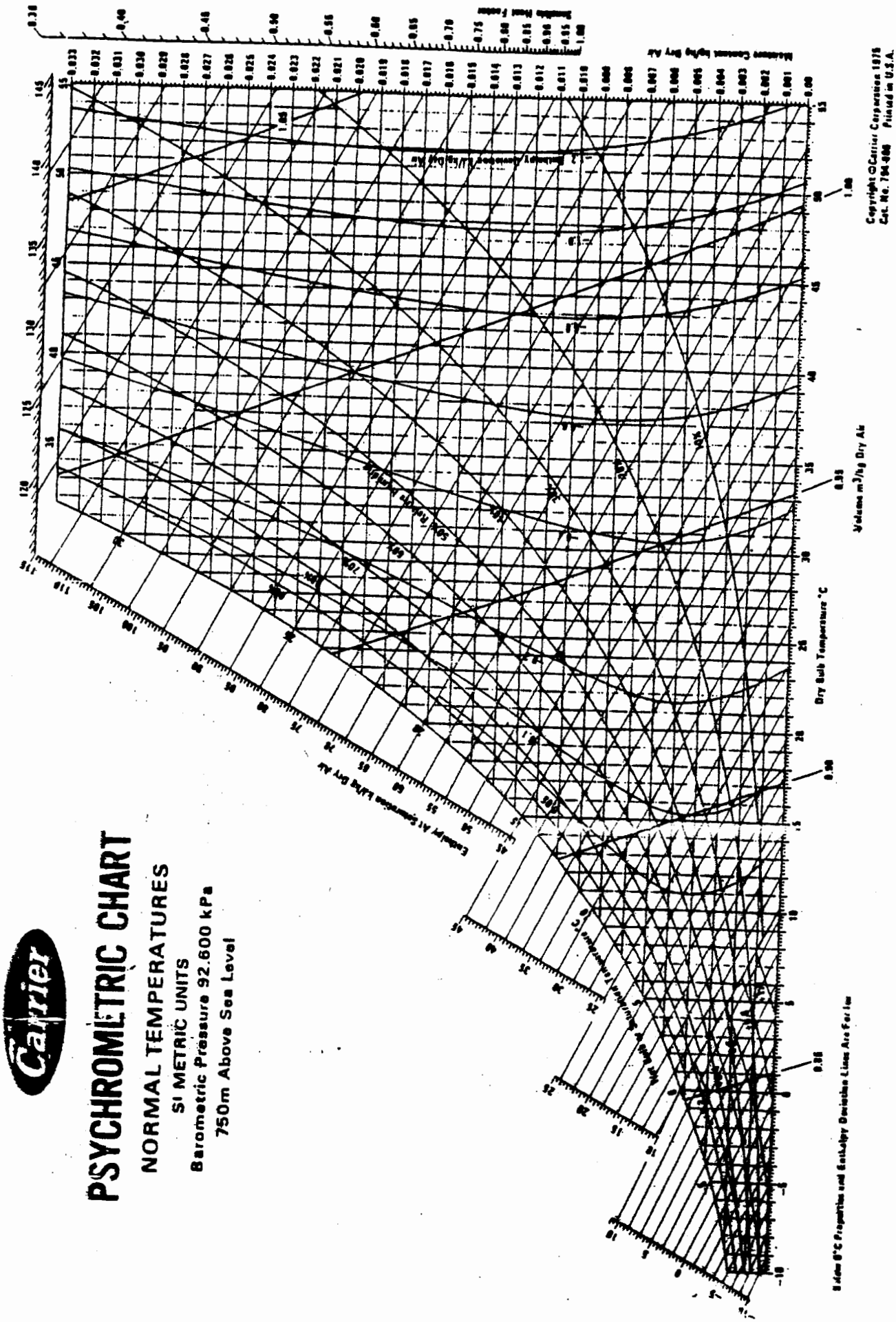
TION FOUR

riefly discuss the types and sources of wastes often encountered on the farm.(8 larks)

b) Discuss one method by which liquid wastes may be removed such as from a cattle pen (6 Marks)

c) Discuss two merits and two demerits of agricultural wastes.(6 marks)

d) A building which has a total weight of 250KN is to be supported on a continuous footing. The perimeter of the footing is 75m and it is 0.3m wide. The soil bearing capacity of the building location is 25KN/m^2. Examine the possibility of consolidation movement.(10 Marks)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