



AS12301 Animal Nutrition, Forage & Feed Technology (Compulsory)

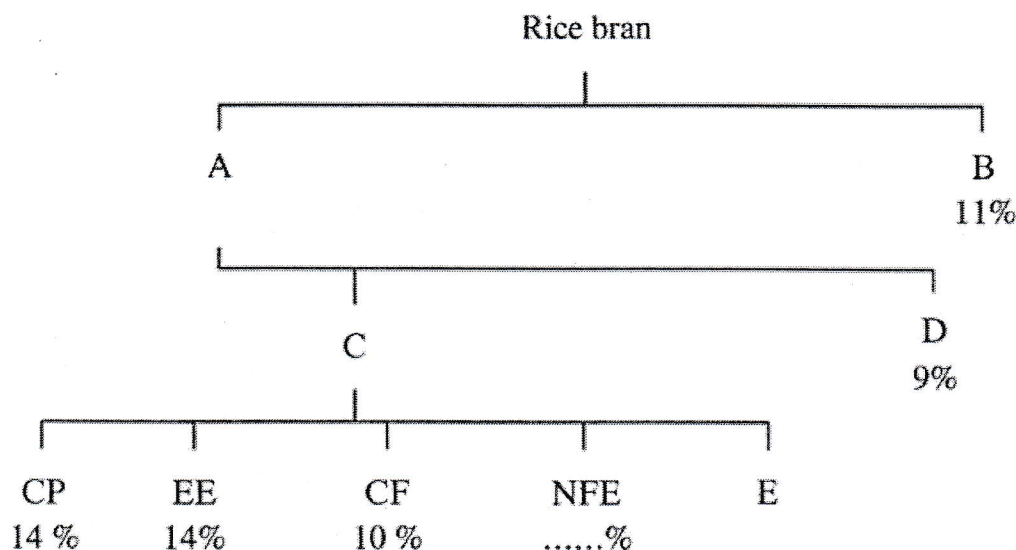
Paper info.	Theory Structured Total number of Questions: <u>4</u> Number of Pages: <u>8</u>	INSTRUCTIONS Answer all questions. Only non-programmable calculators are permitted. Mobile phones are NOT permitted.
Duration	3 (three) Hours	
Index No.		Date: June 22, 2026

EXAMINERS' USE ONLY:

Question Number	Q1	Q2	Q3	Q4
First Examiner's Marks				
Second Examiner's Marks				

1.

A simple classification of the nutrients present in rice bran is given in the flow chart.



i). Identify A, B, C, and D.

(16 marks)

A.....
B.....
C.....
D.....

ii). Name the nutrients abbreviated as CP, EE, CF and NFE.

(12 marks)

CP.....
EE.....
CF.....
NFE.....

iii). Nutrients that come under E can be classified into two major groups.

Mention those two groups, and give examples for each group

(10 marks)

iv). Based on the values given, calculate the values for;

(12 marks)

C:

NFE:

v). Comment on the percentage value given for B.

(10 marks)

vi). List cereals and their by-products (a total of ten) used in animal feeds.

(10 marks)

vii). Briefly discuss the nutritional and anti-nutritional factors that limit the use of rice bran in non-ruminant feeds..

(10 marks)

viii). Briefly discuss the adverse effects of phytates in non-ruminant feeding.

(20 marks)

2.

i) Giving suitable examples, briefly mention the factors affecting water intake of livestock.

(15 marks)

ii. Different energy values of broken rice in poultry and swine are given in table below .

Energy level	Poultry	Swine
GE (A)	3840	B
DE	C	3570
ME	3220	3490
NE	2573	2780

(Source: Brazilian Tables for Poultry and Swine, Feedstuff Composition and Nutrient Requirements, 2017)

a). What are the terms abbreviated as?

(8 marks)

GE.....DE.....

ME.....NE.....

b). What is the unit represented by "A"?

(6 marks)

c). Describe each of the above term (abbreviations should be spelled and briefly explain each).

(20 marks)

GE:

DE:

ME:

NE:

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iii. Giving reasons, mention the value of B.

(8 marks)

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iv. Giving reasons, suggest a reasonable value for C

(8 marks)

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v. "Use of broken rice in swine diets is energetically more efficient than in poultry diets".

Based on the values given in the table, comment on the above statement.

(15 marks)

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vi. List **ten** additives that are used in animal feeds.

(20 marks)

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3.

i) a) What is the esophageal groove?

(5 marks)

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b) How does dysfunction of the esophageal groove lead to ruminal bloat?

(10 marks)

ii) Why do ruminants have the ability to digest cellulose while non-ruminants do not possess this capability? (10 marks)

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iii) Write a brief account on carbohydrate digestion in ruminants (20 marks)

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iv) a) Briefly discuss the importance of feeding fibrous crop residues to ruminants (20 marks)

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b) What are the essential nutrients which should be supplemented when fibrous crop residues are used as the sole feed for ruminants (5 marks)

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[illegible][illegible]

i. Draw and label a forage classification chart, and state two examples belonging to each forage class. (20 Marks).

[illegible]

iii. State **four (04)** factors affecting the quality of silage and **briefly explain** how each one influences the final product. (20 marks)

iv. List the main categories of silage additives used to enhance fermentation and improve nutritional quality (10 Marks)

v. What are the **advantages** and **limitations** of feeding silage in livestock production systems? (15 marks)

[illegible]

[illegible]

- (10 Marks)

[illegible]

- (20 Marks)

[illegible]