HCS612 – Final exam

Name…….

29 November 2001

Complete 10 of the following questions (clearly show which 2 questions you do not answer)
Each question is worth 10 points.

1) Sustainability is a difficult concept to define. From your own view-point, give 5 ways that grasslands are more sustainable compared to other land-use options?

a)

b)

c)

d)

e)

and 5 ways that grasslands are less sustainable than other land-use options

f)

g)

h)

i)

j)

2) Describe 5 methods for measuring pasture mass/yield (one sentence of detail for each method)

a)

b)

c)

d)

e)

3) During class you each worked on a project each. For a project other than your own, describe:

a) In 2-3 sentences what was the project about? (3)

b) What was the objective? (1)

c) What were the main results? (2)

d) What were the main conclusions? (2)

e) What is one point (question) you might want clarified, or for the presenter to have given more detail? (2)

4) Grasslands classically comprise a mixture of grasses and legumes.

a) What are two common grass-legume associations found in grasslands of the world? (2)

b) Legume's role in pastures is primarily to fix nitrogen for subsequent grass growth. What are 4 mechanisms by which nitrogen is made available to grasses – and indicate approximately how long each process takes (4)

i)

ii)

iii)

iv)

c) There are at least 7 factors affecting grass-legume balances. Describe briefly 4 of these factors. (4)

v)

vi)

vii)

viii)

5) a) Forage quality has increasing importance in intensive, high-end animal production. What is the main reason for this? (2)

b) Why is NDF always greater than ADF? (2)

c) What is by-pass protein? (2)

d) Describe briefly two methods for measuring pasture quality? (4)
i)

ii)

6) a) What are the three reservoirs of carbon in grasslands, and what percentage of carbon does each comprise? (3)

b) What is the scope for the two larger of these carbon reservoirs to accumulate (sequester) additional carbon? (4)

c) In what ways has agricultural practice contributed to the increase in global CO_2, and in what ways might grasslands reduce (or enhance) this increase? (3)

7) a) In addition to providing forage for livestock, what are 4 other (non-traditional) uses of grasslands (4)

i.

ii.

iii.

iv.

e) Describe two of these uses in greater detail (2-3 sentences each) (6)

v.

vi.

8) a) What are four functions of roots in grasslands (4)

i)

ii)

iii)

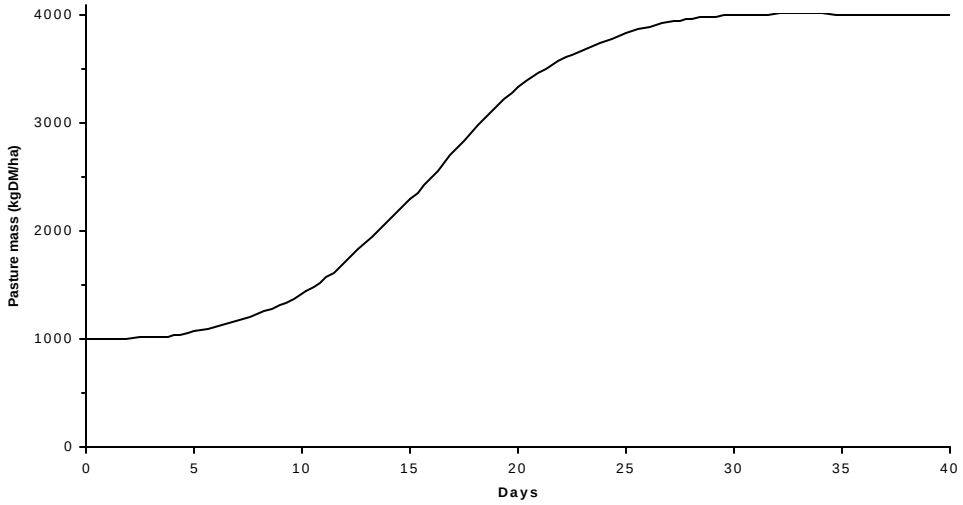
iv)

b) What is the effect of water stress on root growth?(2)

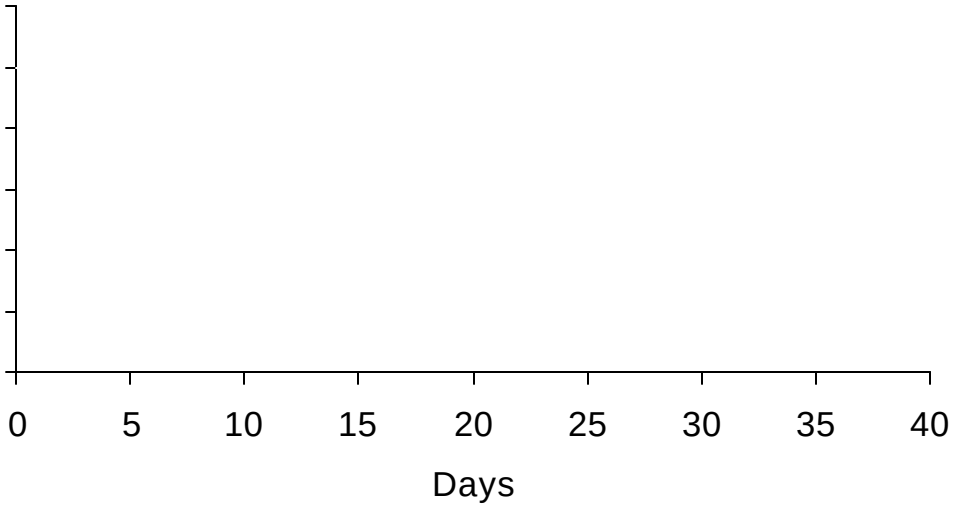
c) What is the effect of grazing on root growth?(2)

d) What is the effect of low fertility on root growth?(2)

9) A typical pasture regrowth curve is given below:



a) An alternative way to present this same figure is as the differential of mass (with respect to time). On the axes below, redraw the above figure as the differential (2)– give the correct dimensions and approximate scale for the y-axis (2).



b) On your figure, label (X-A) the point having the highest growth rate (theoretically, continuous grazing to maintain this growth rate would maximize yield) (2)

c) Label (X-B) the point on the curve that might be typical for the pre-grazing growth rate for an infrequent-lax grazing regime (2)

d) Label (X-C) the point on the curve that might be typical for the post-grazing growth rate for an frequent-intense grazing regime (2)

10) Rotational grazing is popular on many grazing farms, however experimental comparisons between rotational grazing and continuous grazing does not always show any production advantage.

a) Give 2 reasons why a farmer might use rotational grazing (3).

i)

ii)

b) Give 2 reasons why a farmer might use continuous grazing (3).

iii)

iv)

c) Describe 2 reasons why production advantages occur for rotational grazing (4)

v)

vi)

11) What are the main identifying features of the following species, and describe briefly what situations each species is ideally suited for.

a) Birdsfoot trefoil?

b) Perennial ryegrass?

c) Orchardgrass?

d) Annual ryegrass?

e) Kentucky bluegrass?

12) In 4-6 sentences, describe how information from this course might help you in your future career