

National University of Lesotho
Faculty of Agriculture
Department of Soil Science & Resource Conservation

SSR 314/326 - Forestry and Agroforestry

Final Examination paper

**Programmes: B.Sc. Agriculture – Soil Science, Extension,
Economics, Crop Science, Animal Science, and Agriculture
General**

Year 3

December, 2017

Total Marks: 100

3 hours

Instructions: All questions carry equal marks
Answer all the four (4) questions.

QUESTION 1 [25 marks]

a) Fill in the blanks (Do not re-write the question) **(2 marks each)**

- (i) Land covered with grass and herbaceous species with woody species that cover between approximately 10 - 40% of the ground is considered as _____.
- (ii) The integration of trees and shrubs with pastures is called _____.
- (iii) _____ can assimilate and fix the free nitrogen in the atmosphere with the aid of bacteria living in their root nodules.
- (iv) Removing lower branches of forests trees as silvicultural operations to enhance the value for timber production is called _____.
- (v) _____ is the cutting back of the crown of a tree with the objective of harvesting small wood, browse and producing regrowth of a tree.

b) Multiple choice questions **(1 mark each)**

- (i) The world forests are classified into:
 - A. Temperate and equatorial tropical forests
 - B. Equatorial temperate and equatorial tropical forests
 - C. Temperate, tropical and boreal forests
 - D. Woodlands and tropical forests
- (ii) The total indigenous forest cover in Lesotho is
 - A. 13%
 - B. 40%
 - C. 4.5%
 - D. 75%

(iii) The felling made in an immature stand for the purpose of improving the growth and form of tree is termed as:

- A. Heading back
- B. Pruning
- C. Thinning
- D. Coppicing

(iv) The most unwanted effect of agroforestry is on:

- A. Complementarity
- B. Poor family income
- C. Competition
- D. Weed growth

(v) Wind breaks can protect the field from desiccating winds in downwind site up to :

- A. 2 times of height
- B. 10 times of height
- C. 15 times of height
- D. 25 time of height

c) Carbon dioxide in the atmosphere is one of the greenhouse gases, how would afforestation and agroforestry mitigate climate change and help farmers to adapt to climate change? **(10 marks)**

QUESTION 2 [25 marks]

Forest management activities depend on the objective of production.

a) List any three (3) material that can be used as growth media for production of tree seedlings in the nursery **(3 marks)**

b) Why do different types of seeds require pre-treatment before sowing **(6 marks)**

c) Mention methods that are commonly used to propagate the following tree species in the nursery to ensure successful forest establishment? **(5 marks)**

- i) *Pinus radiata*
- ii) *Eucalyptus rubida*
- iii) *Popular nigra*
- iv) *Salix babylonica*
- v) *Acacia meansii*

d) Explain any two methods used to prevent the forest fires hazards. **(6 marks)**

e) Explain the concept of sustainable forest management **(5 marks)**

QUESTION 3 [25 marks]

a) Discuss the following four (4) characteristics as used in ex-ante evaluation of the agroforestry systems or technologies **(12 marks)**.

- i. Productive
- ii. Adoptable
- iii. Sustainable
- iv. Economically

b) A dairy farmer has planted hedgerow trees in parallel rows with a distance of 10 metres between rows, and grows fodder crop between rows of trees and manages them together as an agroforestry system.

- i) Name the agroforestry system practiced by the farmer. **(1 mark)**
- ii) Complete the design or arrangement of the components. **(3 marks)**
- iii) What are possible negative interactions that could result from the poor design of this agroforestry practice **(5 marks)**
- iv) List any four (4) ecosystem services that will be provided by the system **(4 marks)**

QUESTION 4 [25 marks]

- a) From an environmental perspective, what are two advantages and two disadvantages of growing indigenous trees? **(4 marks)**
- b) Lesotho has large areas of eucalyptus plantations. Briefly explain why the government often chooses this species for plantations. **(6 marks)**
- c) Mention characteristics of any three (3) of the following objectives listed below. **(9 Marks)**
- i) Soil erosion control
 - ii) Wind breaks
 - iii) Fire wood
 - iv) Alley cropping
 - v) Home-gardens
 - vi) Silvopasture
 - vii) Multipurpose trees
- d) Give one (1) scientific and common or sesotho name of a tree used for each of the three objective chosen in c). **(6 Marks)**