LAIKIPIA UNIVERSITY

UNIVERSITY EXAMINATIONS

FIRST SEMESTER 2025/2026 ACADEMIC YEAR

THIRD YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (GENERAL)

BOTA 314: ECONOMIC BOTANY

STREAM: R ***TIME: 2 HRS***

DAY: TUESDAY [8.30 – 10.30 A.M] ***DATE: 27/01/2026***

THIS QUESTION PAPER CONSISTS OF SEVEN (7) PAGES

PLEASE DO NOT OPEN UNTIL THE INVIGILATOR SAYS SO.

SECTION A: 40 MARKS

Answer **ALL** questions

QUESTION ONE

I) The concept of "centres of origin of crops" was first proposed by: **(1 Mark)**

a) Carl Linnaeus
b) N.I. Vavilov
c) Charles Darwin
d) Gregor Mendel

II) Centres of origin are important mainly because they: **(1 Mark)**

a) Have the highest crop yields
b) Contain maximum genetic diversity
c) Are the best locations for processing plants
d) Are used only for medicinal plant research

III) Coffee and tea are economically important primarily because: **(1 Mark)**

a) They are staple foods
b) They fix nitrogen
c) They contribute significantly to global trade
d) They are fibre crops

IV) Which of the following is *not* a pulse? **(1 Mark)**

a) Cowpea
b) Soybean
c) Chickpea
d) Sorghum

V) Pulses are valued in agriculture because they: **(1 Mark)**

a) Require very little water
b) Fix atmospheric nitrogen
c) Produce essential oils
d) Are fibre-rich stems

VI) Primary metabolites include: **(1 Mark)**

a) Alkaloids
b) Flavonoids
c) Carbohydrates
d) Terpenoids

VII) A major factor influencing domestication of plants is: **(1 Mark)**

a) Seed dormancy
b) Leaf venation
c) Flower colour
d) Transpiration rate

VIII) Latex is extracted from rubber trees using a process known as: **(1 Mark)**

a) Pollarding
b) Tapping
c) Layering
d) Decortication

IX) In rubber processing, coagulation is used to: **(1 Mark)**

a) Remove moisture
b) Convert latex into solid rubber
c) Improve fibre length
d) Remove latex from leaves

X) Cotton fibres originate from which plant part? **(1 Mark)**

a) Stem bark
b) Leaf veins
c) Seed hairs
d) Root epidermis

XI) Sisal fibre is extracted mainly from: **(1 Mark)**

a) Gossypium species
b) Musa species
c) *Agave sisalana*
d) *Linum usitatissimum*

XII) The main industrial use of sisal is in: **(1 Mark)**

a) Paper production
b) Ropes and twines
c) Plastics
d) Biofuel manufacturing

XIII) Which plant contains the anti-malaria compound artemisinin? **(1 Mark)**

a) Aloe vera
b) Artemisia annua
c) Cinchona officinalis
d) Catharanthus roseus

XIV) A risk associated with medicinal plant use is: **(1 Mark)**

a) Sustainable harvesting
b) Standardized dosage
c) Potential toxicity and adulteration
d) High global prices

XV) Sustainable utilization of medicinal plants involves: **(1 Mark)**

a) Harvesting only roots
b) Cultivation and controlled wild collection
c) Eliminating traditional healers
d) Exporting all harvested material

XVI) Under-utilized indigenous crops are important because they: **(1 Mark**

a) Are easily replaced by imported foods
b) Often tolerate harsh climates
c) Have no nutritional value
d) Are mostly ornamentals

XVII) An example of an under-utilized African crop is: **(1 Mark)**

a) Wheat
b) Rice
c) Bambara groundnut
d) Sugarcane

XVIII) Promotion of under-utilized crops can be achieved through: **(1 Mark)**

a) Reduction in extension services
b) Breeding for improved traits
c) Banning local markets
d) Eliminating value-addition

XIX) The main economic use of natural rubber is in: **(1 Mark)**

a) Fabric dyeing
b) Tyre manufacturing
c) Perfume production
d) Fertilizer synthesis

XX) Cotton and sisal differ because: **(1 Mark)**

a) Both are seed fibres
b) Cotton is a seed fibre; sisal is a leaf fibre
c) Cotton grows in deserts; sisal does not
d) Sisal is softer than cotton

XXI) Cinchona tree bark is famous for producing: **(1 Mark)**

a) Codeine
b) Quinine
c) Nicotine
d) Morphine

XXII) A key characteristic of pulses is that they are: **(1 Mark)**

a) High in oils
b) Rich in protein
c) Used mainly as fibres
d) Exclusively perennial

XXIII) Decortication is a fibre-processing method used in: **(1 Mark)**

a) Cotton
b) Jute
c) Sisal
d) Flax

XIV) Which of the following best describes secondary metabolites? **(1 Mark)**

a) Required for photosynthesis
b) Always stored in seeds
c) Often involved in ecological interactions
d) Always water-soluble

XXV) A primary advantage of agricultural biodiversity is: **(1 Mark)**

a) Increased reliance on a few crops
b) Higher vulnerability to climate change
c) Availability of diverse genetic resources
d) Reduced food security

QUESTION TWO

a) Explain the concept of **centres of origin of crops** and discuss its significance in plant genetic resources. **(2 Marks)**

b) Describe three factors affecting the **domestication of wild plant species**. **(3 Marks)**

QUESTION THREE

Using **cotton** and **sisal** as examples, compare and contrast plant fibres based on:

a) botanical sources **(2 Marks)**
b) processing methods **(4 Marks)**
c) major industrial uses **(2 Marks)**
d) economic challenges faced in their production and trade **(2 Marks)**

SECTION B (30 MARKS) ANSWER ANY TWO QUESTIONS

QUESTION FOUR

Critically discuss how **under-utilized indigenous crops** can contribute to food and nutritional security in Africa, under the following sub-titles

a) nutritional and agronomic advantages **(5 Marks)**
b) challenges limiting their widespread adoption **(5 Marks)**
c) strategies for their promotion and commercialization **(5 Marks)**

QUESTION FIVE

Describe the different methods of extraction of essential oils **(15 Marks)**

QUESTION SIX

a) Explain the sources, chemistry, Selectivity and mode of action of rotenoids **(10 Marks)**

b) Briefly describe the effects of *Cartha edulis* on human health **(5 Marks)**