**SECTION A**

**1 The four types of records that a farmer should keep**

* + Field operations records.
  + Production records
  + Consumable goods inventory.
  + Permanent goods inventory.
  + Market records
  + Labour records
  + Breeding records.

Benefits of labour 4x½=2mks

2 Opportunity cost is zero 2x½=1mk

i)When there are no alternative/choices in enterprises

ii)When production resources are not limited/are abundant free

3. **4 reasons for keeping livestock health records**.

i) Help in calculation of treatment and health costs

ii) Help in culling/selecting livestock

iii) Help in future diagnosis treatment and control measures

iv) Help determine the common diseases and parasites/prevent diseases and

parasites

v) Help to support livestock insurance claims (4 x 1/2 = 2 marks)

**4 -**To kill the weeds

-Bury crop residues/organic matter into the soil

-Loosen up the soil/facilitate rainfall infiltration/improve aeration/easy penetration of roots.

-Control soil borne pests/diseases by destroying their life cycles.

-Make subsequent operations easier. 4x½=2mks

***5.soil structure*** is the physical arrangement of soil particles and how they adhere to each other to form an aggregate where as ***soil texture*** is the relative proportion of various sizes of mineral particles in the soil. ***(1 mark)***

**6.** a)shovel

- Mixing mortar/manure

- Lifting soil/manure (1 x 1/2 = 1/2 mark)

b) Strip cup

- To detect mastitis infection in milk. (1 x 1/2 = 1/2 mark)

7. Olericulture-the growing of vegetables such as French beans, cabbages, tomatoes onions under both small scale and large scale.

Pomoculture- growing of fruits such as citrus,mangoes,passion fruits and pineapples

2x1=2mks

8-.conditions under which shifting cultivation is practiced

* Where land is abundant
* Where population is sparse
* Where the number of livestock per unit area is low
* Where land is communally owned 4x½=2mks

9.It is a source of food for the population.

-Earns foreign exchange for the country

-Provides market industrial goods.

-Farmers earn a lot of income

-Provides employment both directly and indirectly.3x1=3mks

10.i)Jersey 1x1=1mk

ii) Friesian 1x1=1mk

**11 Characteristics of goats that adopt them rid areas**

* Good foragers hence survive on poor pastures.
* Ability to eat dry feeds
* Heat tolerant tissues.2x½=1mk

12-Leaching/ soil erosion

-Change of soil pH

-Burning of land/ volatilization/ denitrification/ accumulation of salts

-Fixation of nutrients/ nitrogen lock up

-Uptake by plants/ weeds

Continuous cropping

-Soil capping/ formation of hard pan

-Presence of soil – borne pests

Monocropping

4x½=2mks

13.Rapid growth rate

-Production of abundant foliage

-Rich in plant nutrients/ leguminous/ rich in nitrogen

-Ability to decay quickly

-Adaptable to wide range of conditions/ hardy. 4x½=2mks

**14. -** Destroy organic matter

-Destroy soil structure

-Kill useful soil micro organism

-Exposes soil to agent of erosion

-Causes nutrient imbalance/loss of volatile nutrients/accumulation of ;;;;;

-Destroy soil water 4x½=2mks

15 Functions of ingredients

* + 1. Wood ash
       1. Improves level of phosphorus and potassium in the manure
       2. Modifies soil PH to enhance microbial activities/reduce acidy 1x1=1mk
    2. Top soil
       1. Introduces micro- organism necessary for decomposition of organic material 1x1=1mk

**16 Reasons for water treatment**

* To remove bad smell and taste
* To kill harmful micro-organisms which thrive in dirty water e.g. bacteria.
* To remove solid particles e.g. soil, sand sticks
* To remove excess chemical impurities e.g. fluorides to soften water 4x½=2mks

SECTION B

17 (a) Ridging 1x1=1mk

(b) Advantages of ridges

(i) Promote tuber/root expansion/development

(ii) Facilitate harvesting of root crop

iv) Conserve soil and water

v) Facilitates drainage in water logged soils

vi Encourage root penetration/distribution 2x1=2mks

**18** a)Light intensity.

-Light wavelength

-Light duration / photosynthesis 2x1=2mks

b)i) Capillarity in the three different soil samples. 1x1=1mk

ii) G – Sandy soil

J – Clay soil 2x½=1mk

iii) G – Rough and coarse texture

J – Fine textured 2x1=2mks

iv) Addition of organic manure – Addition of lime 1x1=1mk

19. ( (i) E - adjustable spanner

F - Ring spanner 2 x ½ = 1 mks)

(ii) Tool E can be used for tightening or loosening more than two sizes of nuts and bolts (Rejects one is adjustable (1 mk)

20 a) Dairy breed (1 x 1/2 = 1/2 mark)

b) Friesian/Jersey/Guernsey/Ayrshire (1 x 1 = 1 mark)

c) Physical characteristics of dairy cattle

* + Wedge/triangular shaped
  + Straight topline
  + Large and well developed udders teats
  + Prominent milk veins
  + Lean bodies/thinly fleshed waters
  + Large stomach
  + Small head and long neck
  + Well set wide hind quarters
  + Prominent/visible pin bones
  + Long thin legs

21. a) A1- root stock A2- scion 2x1=2mks

b) A3 Grafting B- Trench layering 2x1=2mks

**22.** (a) Single stem pruning 1mk

(b) Disadvantages of multiple stem pruning

* Breaking of stems and branches
* Difficulties in gathering berries from top points
* Difficulties in spraying
* Rotting of stumps with age 2x1=2mks

23 a) i) Correct pruning

- B

NB: Wrong identity

Wrong reason (1 x 1/2 = 1/2 mark)

ii) Reason

- Slant cut is a few centimetres above the bud/leaf (1 x 1 = 1 mark)

b) 2 ways in which pruning controls diseases

i) Removes diseased parts

ii) Creates unfavourable conditions/environment for disease agents

iii) Facilitates penetration of chemical sprays. (2 x 1/2 = 1 marks)

24. a) K-tapeworm M-liver fluke 2x½=1mk

b) K Small intestine

M The liver 2X1=2mks

c) Water snail (1x1=1mk)

SECTION C

**25a) *Growth habit of the crop/nature of plant growth***: crops that tiller, spread, creep, tall may require a wider spacing than those that do not.

* ***Intended use/purpose of the crops***: maize for silage is planted at a closer spacing than that for grain production.
* ***Type of machinery to use for field maintenance operation***: spacing adopted should allow passage for various operations such as weed control, spraying and harvesting.
* ***Soil fertility***: a fertile soil allows for closer spacing compared to poor soils.
* ***Moisture content of the soil/amount of rainfall in the area***: high moisure content/rainfall may allow closer spacing but low rainfall may necessitate wider spacing.
* ***Interplanted crops***: crops planted with others in rows will require wider spacing.5x2=10mks

***b) Improves soil fertility***: When legumes are included in the rotation, nitrogen is fixed/added in the soil.

* ***Control of pests/diseases***: Rotation of crops disrupts the life cycles of certain pests and diseases.
* ***Control of weeds***: It helps to control weeds which are specific to certain crops for example:- striga in cereals/cover crops in a rotation will smother certain weeds.
* ***Better use of the soil nutrients***: Different crops (due to differing root systems) draw nutrients from varying soil horizons/different crops have different nutrient demands, therefore when alternated leads to better nutrient utilization.
* ***Control of soil erosion***. Crops planted in rows for example:- maize should be alternated with cover crops to ensure that soil erosion is reduced.
* ***Improves soil structure***: Grass leys established will improve soil structure through the roots by binding soil particles together/during the grass ley period organic matter will accumulate to enrich the soil and improve soil structure. ***(5x2=10 marks)***

**26 a) Signs of ill –health**

* + Behaviour of the animal –aggressiveness. Over excitement or produces abnormal sounds
    - Isolating from others /photophobic
    - -Animal movement –limping /lameness/ strained gait
    - -Skin /coat –ruffled/starry coat/ loss of hair/dull skin/part peeling

Off/cracking/wounds/lesion/swelling

* + - -mucous membrane-Dull red/pale/dry/having copious discharge
    - -production/performance level: sudden decline in production/performance

/loss of weight and condition

* + - -pulse rate: radical departure from the normal range
    - -Respiratory rate: Abnormal temperature from the normal range
    - -Body Temperature: Abnormal temperature from the normal range/too high/too low
    - Appetite and feeding: Increased/lack of appetite /abnormal chewing/ swallowing/feeding on abnormal food substances
    - Urination: Abnormal urine colour matter in terms of consistency/smell/colour, difficult urination/less or high frequency
    - Profuse salivation
    - lachrimation
    - defecation process: abnormal fecal matter interns of consistency /smell/color presence of parasite/egg segment/blood stain/frequency

(10x1) = 10mks

b). General farm hygiene/ cleanliness of houses. Feed/ water trough –

* proper carcass Disposal; to destroy pathogens
* Isolation; prevents spread of the diseases
* Drenching; to control internal parasites
* Treat sick animals; prevent spread of the diseases
* Vaccination; develop resistance against diseases.
* Control vectors, prevent transmission of diseases
* Prophylaxis; avoids infection
* Slaughtering those infected by highly infectious and contagious diseases
* Proper breeding; control breeding diseases
* Quarantine; avoid spread of the diseases
* Hoof trimming; minimize occurrence of foot rot
* Proper housing; avoid predisposing causes of diseases 5x2=10mks