

SECTION A [50 MARKS]
ANSWER ALL QUESTION

Question 1

- a) **Direction: For each question, there are four alternatives A, B, C and D. Choose the correct alternative and circle it. Do not circle more than ONE alternative. If there are more than one choice circled, NO score will be awarded.** [20]
- i. Which of the following dairy breed is native to Bhutan?
- A Thrabam
 - B Jersey Cross
 - C Brown Swiss
 - D Holstein Friesian
- ii. Which of the following is **NOT** true about growing pear?
- A need full sunlight
 - B require regular pruning
 - C need to be planted in well-drained soil
 - D can be only propagated through grafting
- iii. Ap Dawa wants to plant ginger in his fields. Which cultivation order would you suggest to him?
- I Soil solarization of beds for 20 days
 - II Earthing up to prevent exposure of rhizomes
 - III Seed rhizome bits are placed in trench
 - IV Removal of mother rhizome to give proper space
- A I, II, III and IV
 - B I, III, IV and II
 - C II, III, I and IV
 - D I, III, II and IV
- iv. A lawn can be described as
- A a garden laid out and decorated with rocks.
 - B a piece of land designed with different flowers.
 - C a beautifully designed piece of land using foliage plants.
 - D an area where grass is grown as a green carpet for landscape.

- v. The most effective and commonly used propagation technique for citrus is
- A seed.
 - B cutting.
 - C grafting.
 - D air layering.
- vi. What causes onion rot?
- A earthing up
 - B bacterial diseases
 - C high density cultivation
 - D poor post-harvest handling
- vii. “Bhutan the land of the Thunder Dragon is also known as *Menjong Gyalkhab*.”
- Which of the following best supports the statement?
- A Ruta, Manu, Goned and Gurgum are found abundantly.
 - B There are 7000 plant species having medicinal properties.
 - C There are more than 300 plants with medicinal properties.
 - D There are more than 600 plant species with medicinal properties.
- viii. Why is it possible to grow tomatoes and chillies all year round in Bhutan?
- A introduction of high yielding seeds
 - B highly variable agro-ecological zones
 - C use of plastic mulching to reduce weeds
 - D use of farm machineries to speed up production
- ix. Pests and diseases that affect animals can have a major impact on dairy farm business. The cow in the picture below is suffering from



- A anthrax.
- B ectoparasite.
- C black quarter.
- D haemorrhagic septicaemia.

- x. Which cattle breed would you recommend for farmers in Bumthang and Gasa?
- A Jersey
 - B Thrabam
 - C Brown swiss
 - D Holstein Friesian
- xi. What basic factors should be considered in growing vegetables?
- A sun light, water, spacing, soil nutrients and pH
 - B sun light, temperature, spacing and air drainage
 - C air drainage, temperature, spacing, soil nutrient and pH
 - D sun light, air drainage, water, resistance to disease and pests
- xii. Dairy cattle are prone to many diseases. The points given below are the preventive and control measures that can be adopted. Select the best measures to prevent and control foot and mouth diseases.
- I Routine vaccination of the herd
 - II Isolation of infected animals from others
 - III Washing of infected animal
 - IV Keeping dairy shed clean
- A I, II and III
 - B I, II and IV
 - C I, III and IV
 - D II, III and IV
- xiii. In remote places, most farmers are unaware of pre harvest factors which result in post-harvest losses. Issues like loss of water from fresh produce after harvest is considered a serious problem.
- Which pre harvest factor is associated with the above?
- A respiration
 - B transpiration
 - C cultural operations
 - D selection of varieties
- xiv. What makes yaks suitable to be raised by the highlanders?
- A Yak milk is much richer than cow's milk.
 - B Sturdy foot enables yaks to carry heavy load.
 - C Yaks can thrive in a harsh environment/climate.
 - D Their live weight generally ranges from 180-550 kg and fetches good price.

xv. Which of the following vegetables require harvesting tools?



I



II



III



IV

- A I and II only
- B I and IV only
- C II and III only
- D III and IV only

xvi. Which of the following statement best distinguishes a Jersey cow from a Holstein cow?

- A Jerseys weigh about 700 to 800 kg whereas Holsteins weigh about 500 to 550 kg.
- B Jerseys are the smallest in size whereas Holsteins are the largest amongst dairy breeds.
- C Jerseys have strong feet whereas Holsteins also have strong feet with loose skin hanging from their neck.
- D Jerseys have black muzzle with light encircling ring whereas Holsteins have white encircling ring only.

xvii. People with specialization in landscape planning and designing have

- A less chances of earning a livelihood.
- B more opportunities as business entrepreneurs.
- C less opportunities as it is relatively a new profession.
- D less scope of applying ideas and concepts as our landscapes are not suitable.

xviii. Which of the following is not the component of vertical farming?

- A requires potting soil
- B aquaponic growing systems
- C sole-source electrical lighting
- D multi-layer production shelves

xix. Which of the following conditions are optimal for growing vegetables in hydroponic?

- I water with pH range of 5.0 to 7.0
- II balanced primary nutrients required
- III enough soil to provide additional nutrients
- IV high content of dissolved oxygen in the water

- A I, II and III
- B I, II and IV
- C I, III and IV
- D I, II, III and IV

xx. The diagram below is one of the harvesting methods used by the people in Paro.



The method of harvesting in the picture above is being practised because

- A there is less production.
- B it is a large scale cultivation.
- C it is time consuming process.
- D less care is required for the produce.

b) Write TRUE or FALSE for the following statements in the space provided.

[5]

i. Large cardamom being a sciophyte, over exposure of plants to direct sunlight is necessary for good growth, timely flowering and for better crop.		
ii. The first asparagus spears that appear in the first year after transplanting should be harvested for better yield in successive years.		

iii. Brown Swiss are quiet, docile and easily manageable, and can tolerate more heat than Jersey.		
iv. It is best to harvest vegetables during or immediately after rains to reduce the field heat to prevent senescence.		
v. Vertical farming uses significantly less water compared to traditional farming system.		

- c) Match each item under column A with the most appropriate item in column B. [5]
 Rewrite the correct pairs by writing the alphabet against the number in the space provided.

Answer	Column B	Column A	
	i. Using an element more than once throughout a design.	a) balance	
	ii. Equalization of visual weight from one area of a landscape composition to another.	b) proportion	
	iii. Attract an observer's attention.	c) interconnection	
	iv. Relationship between the components of the landscape.	d) accent	
	v. Produces unity in the design by physically linking the components together.	e) repetition	
		f) unity	

- d) Fill in the blanks with appropriate word/s. [5]

i. In order to reduce the risk of carrot fly, farmers are recommended to intercrop carrots with _____.	
ii. The best way to propagate areca nut trees is through _____.	
iii. Post milking teat disinfection is one of the best ways of preventing the spread of contagious _____.	

iv. The damage on vegetables due to pressure and thrust during transportation is classified under _____ losses.	
v. Onions tend to flower when grown in _____.	

e) Answer the following questions briefly.

- i. The health of the plant shown in the image below started deteriorating in spite of routine watering and weeding. Suggest any **TWO** principles of container gardening to improve the plant's condition.



[2]

- ii. Anthrax is a bacterial disease seen mostly in cattle, sheep and goats. State **ONE** control and **ONE** preventive measure.

[2]

iii. Ginger is considered to have immense health benefits. Explain **TWO** uses of it. [2]

iv. Asparagus is a delicious early summer vegetable which can be cultivated easily. How would you propagate asparagus? [2]

- v. Suggest any **TWO** good horticulture management practices to grow dragon fruit. [2]

- vi. Ornamental horticulture consists of floriculture and landscape design. This is a booming industry across the globe. State **TWO** opportunities for horticulturists in Bhutan. [2]

- vii. Maintaining continuous bloom during the flowering season is one of the important garden management practices. Write **ONE** method to ensure continuous bloom of gladiolus. [1]

viii. Classify the following post-harvest losses into primary and secondary causes. [2]

- prolonged time taken for harvesting
- rooting and greening of potatoes
- inadequate harvesting facilities
- microbial spoilage of produce

Primary Causes	Secondary Causes	



SECTION B [50 MARKS]
ATTEMPT ANY FIVE QUESTIONS

Question 2

a) Mention any **TWO** medicinal values of cordyceps. [2]

b) Complete the table given below.

[4]

Pest and disease of Vegetables	Symptoms
1.	Initially, small dark spots form on older foliage near the ground. Leaf spots are round, brown and can grow up to half-inch in diameter and severely infected leaves turn brown and fall off.
2.	
3.	
4.	Yellowing and wilting of above ground parts and large spindle-shaped gall on the roots.

c) Rearrange Ap Sangay's draft dairy farm business plan in the correct order.

[4]

1. Market analysis	5. Selection of breeds and products
2. Publicity and advertising strategy	6. Job roles and responsibilities
3. Sales and marketing strategy	7. Budgeting (start-up expenditure)
4. Sustainability and expansion strategy	8. SWOT analysis

Question 3

- a) Tomatoes can be cultivated in protective coverings like greenhouses, rooftops and in open spaces. If you are asked to grow tomatoes, which cultivation practice (open field or protected) would you choose and why? List **FOUR** benefits. [5]

- b) The udder of a Jersey cow has become hard, swollen, hot and milk produced is watery or bloody.
- i. What disease is the Jersey suffering from? [1]

- ii. List any **TWO** control measures of this disease.

[1]

- c) Harvesting is one of the important operations that decide the quality as well as storage life of produce and helps in preventing huge losses of fruits. Write **THREE** procedures of harvesting that must to be taken into consideration to control the post-harvest loss of fruits.

[3]

Question 4

- a) State **THREE** horticultural management practices that can be adopted to overcome the effect of climate change. [3]

- b) Study the images of landscape designs given below. Which one is better? Give **THREE** reasons to support your choice. [4]



Landscape design I



Landscape design II

c) If you were to choose between organic farming and agrochemical farming, which would you prefer? Support your stand with **THREE** points. **[3]**

Question 5

- a) The following are examples of common pests and diseases of dairy farming. Classify each of them under pest and disease. [3]

Mastitis, Anthrax, Horn flies, Lice, Black Quarter and Mites

Pest	Disease	

- b) Design and layout a landscape by incorporating any **TWO** landscape design elements and label them. [2]

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- c) Container gardening is one of the smart ways of farming in the cities where there is no land for cultivating vegetables. List down the steps for container gardening. [2]

- d) Dairy farming is an integral part of small holder farming system in Bhutan. Despite government assistance and support, farmers are losing interest. State **THREE** reasons. [3]

Question 6

- a) What will happen if hydroponic growers forget to change water or over water the plants?

[4]

- b) “The nursery structure and management are very important for floriculture”. Explain **TWO** advantages of growing flowers in a nursery instead of direct sowing.

[2]

- c) One way of increasing Manu production is by practising mulching. Examine **FOUR** [4]
roles played by mulching in increasing the production.

Question 7

- a) A group of farmers is planning to construct a pack house facility for their [4]
community. What **FOUR** features of a good pack house facility would you
recommend?

b) Explain how rose is propagated through stem cutting. [4]

c) Write **TWO** benefits of proper post-harvest management of fruits and vegetables. [2]
