

**ROYAL CIVIL SERVICE COMMISSION**  
**CIVIL SERVICE COMMON EXAMINATION (CSCE) 2008-12-16 EXAMINATION**  
**CATEGORY: TECHNICAL**

**PAPER III: SUBJECT SPECIALIZATION PAPER FOR HORTICULTURE**

Date	20/12/2008
Total Marks	100
Examination Time	2.5 hours
Reading time	15 minutes

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**General Instructions**

1. This paper consists of 2 sections. Section A consists of 30 multiple choice questions of 1 mark each and 4 short answer questions of 5 mark each. Answer all the questions in the answer sheet provided.
2. Section B consists of two case studies. Candidates are required to attempt one case study and answer the questions. This consists of 50 marks.
3. The total number of pages on this question paper is **8 pages**

**Section A**

**Answer all the questions**

1. Choose the correct answer (30 x 1 = 30 marks)
  1. The term pH is derived from
    - a. the physical Haze in solution
    - b. the parts hydrogen in solution
    - c. the parts of highlighted particles
    - d. particle hydrogenation
  2. The addition of lime in soil helps to
    - a. tie up the NPK for better utilisation
    - b. locks and water in the cells of the plant
    - c. frees up the elements plant nutrition
    - d. dilutes the plant sap
  3. The presence of organic matter is required in soil even when chemical fertilisers are used because
    - a. it competes with the fertiliser and locks the nutrients
    - b. it mobilises the elements in the soil for absorption
    - c. it is a traditional practice and it is important to continue it
    - d. It helps to keep the soil compact
  4. A form of tree training that shows a slanted tree trunk in a row is called
    - a. the espaliered system
    - b. the cordon system
    - c. the free from system
    - d. the central leader system
  5. The most important resulting effect of rootstock on the tree is the
    - a. the shape of the tree

- b. the canopy density of the tree
  - c. the height of the tree
  - d. the taste of the fruits
6. One of the benefits of companion planting is
- a. the benefit of physical support
  - b. the repulsion of pests
  - c. the benefit of soil nutrition sharing
  - d. the yield improvement of the companion crop
7. The time for collection of cutting for propagation by soft wood cutting is best done at this time of the year
- a. the early spring
  - b. the mid summer
  - c. the early autumn
  - d. the late winter
8. layering and air layering is a suitable method of propagating this plant
- a. Strawberry
  - b. Apple trees
  - c. Calendula
  - d. Chestnut
9. If you wanted to rejuvenate an old tree you would choose this type of pruning
- a. Thinning cuts
  - b. Renovative pruning
  - c. Regenerative pruning
  - d. Formative pruning
10. When there is high nitrogen content in the soil environment it has this effect
- a. Increased nitrogen fixation
  - b. Decreased nitrogen fixation
  - c. More nodulation in legumes
  - d. No nodulation in legumes
11. This system of farming is not in line with organic agriculture
- a. Ecological horticulture
  - b. Biological horticulture
  - c. Sustainable horticulture
  - d. Conventional horticulture
12. This is the least environmentally friendly fruit management system
- a. Biological control of pests
  - b. Alternative pesticides
  - c. Little or allowable chemical pesticides
  - d. Orchard designs and canopy management system for isolation of problems
13. This is not true in hydroponics
- a. There is no soil involved

- b. There is no nutrients involved
  - c. There can be plastic support involved
  - d. There is need for freely available water
14. Deficiency of calcium can be seen as:
- a. Yellow lower leaves
  - b. Small purple blotches
  - c. Interveinal chlorosis
  - d. Blossom end rot
15. This combination of fresh produce in storage is good
- a. Apples and cut carnations
  - b. Carrots and cut carnations
  - c. Bananas and cut carnations
  - d. Peaches and cut carnations.
16. this is not useful in post harvest storage
- a. Removal of water from produce
  - b. Removal of alcohol from produce
  - c. Addition of sugar in produce
  - d. Addition of humidity in produce
17. The crop need not have a polliniser variety
- a. Apple
  - b. Kiwi fruit
  - c. Cherry
  - d. Banana
18. This is not a maturity indicators used in assessment for harvesting a fruit
- a. Sugar content
  - b. Starch content
  - c. Flesh firmness
  - d. Salt content
19. Broccoli is an example of \_\_\_\_\_ flower buds
- a. edible
  - b. cultivated
  - c. lateral
  - d. dehydrated
20. When selecting a soil sample to determine the need for fertilizer, the best tool to use is
- a:
- a. hoe
  - b. scoop shovel
  - c. auger
  - d. backhoe
21. The pH in soils can be raised by adding:
- a. Sand
  - b. lime

- c. sulphur
  - d. nitrogen
22. The botanical name of onion is:
- a. *Allium cepa*
  - b. *Allium sativum*
  - c. *Allium porrum*
  - d. *Allium schoenoparsum*
23. Blossom end rot in tomatoes are caused by:
- a. *Botrytis cineria*
  - b. *Alternaria solani*
  - c. Stress for water and calcium
  - d. None of the above
24. TSS / TAA indicates:
- a. Total soluble solids in fruits
  - b. Total sugar content
  - c. Maturity index
  - d. Total titratable acidity
25. Is the edible type of fig:
- a. *Ficus elastica*
  - b. *Ficus benjamina*
  - c. *Ficus carica*
  - d. *Ficus lyrata*
26. This is the most common disease in apples of Bhutan:
- a. Fire blight
  - b. Phytophthora rot
  - c. Scab
  - d. Rust
27. This is a very high value medicinal plant collected from high altitudes in Bhutan:
- a. *Actinidia chinensis*
  - b. *Ruta graveolens*
  - c. *Dianthus chinensis*
  - d. *Cordyceps sinensis*
28. "Mary Washington" is a classic variety of:
- a. chive
  - b. asparagus
  - c. tomato
  - d. pepper
29. The biggest horticultural export commodity from Bhutan, by volume is:
- a. Mandarin citrus
  - b. Apple
  - c. Potato
  - d. Cardamom

30. Vermi-compost is the product obtained from:

- Composting using vermiculite
- Composting using vermins
- Composting using earthworms
- Composting using manure

II. Answer the following short questions (4 x 5 marks = 20)

- What are the advantages and disadvantages of vegetative propagation and name two plants they are generally used for. (5 marks)
- From the list provided in Table 1, choose the pest or disease that you are most familiar with by placing a tick in the appropriate box.

Table 1. Selected pests or diseases

powdery mildew	
<i>Phytophthora capsici</i>	
aphids	
cabbage moth	
rusts	

- Explain how a manager would recognize that this pest or disease is present. (2 marks)
- For your chosen pest or disease select and answer the following. (1.5 marks each)
  - Describe the best way to monitor the likelihood of your chosen pest or disease becoming a problem.
  - List the best times to prevent and control your chosen pest or disease
- What is a cultivar? Write how this word is derived. (5 marks)
- Proper selection of rootstock is done for many reasons besides height control of the tree, mention three other reasons (5 marks)

## Section B

Choose one of the case studies presented and answer the questions. (50 marks)

### Case 1

Apple growing community in Thimphu has found that the size of the fruit has decreased over the years as the orchard has grown over the years. The yield of the orchard has not been consistent because some years it is high but other years it is low and they growers have used the same amount of fertilisers every year. They do not have good irrigation so they rely on rainfall as the main water supply. The quality of fruits is poor as the colouration is not uniform and the buyers reject the small and green fruit and the price they fetch is low. If they could produce bigger better coloured fruit annually they would have better consistency in their income. They have had no training on tree management so they do not know about pruning.

1. Describe the problems that are likely to be present in the community's management of the orchards and identify the causes.
2. Write a management plan and corrective actions that need to be taken to improve the productivity of this orchard.
3. Suggest additional specific actions to be taken to improve the profitability of the orchard

## Case 2

From **Table 2** below, choose one horticultural business that you are familiar with in terms of its business management. Show your choice by placing a tick in the box next to it and answer the following questions. (50 marks)

**Table 2. Selected business types**

Turf production	
Garden design	
Ornamental garden maintenance	
Field grown vegetables, herbs	
Production of fruit/ nut from trees	

**i.** Managers need financial, marketing and production skills to operate a business.

**i.** List four different production skills needed to operate a business of the type you have chosen. (10 marks)

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

**ii.** Four broad types of risk that can influence the profitability of a business are listed below. In the space provided, describe an example of each type of risk that specifically affects your chosen business type. (20 marks)

Type of risk	Example of a risk that specifically affects your chosen business type
Environmental	
Marketing	
Financial	
Production	

- 2.
- i. Describe a quality standard appropriate to your chosen business (10 marks)
  - ii. Explain how the business manager would ensure that this standard is achieved (10 marks)

END OF QUESTION PAPER

TASHI DELEK!!!!!!