

**ROYAL CIVIL SERVICE COMMISSION**  
**BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2013**  
**EXAMINATION CATEGORY: TECHNICAL**

**PAPER III: SUBJECT SPECIALIZATION PAPER for AGRICULTURE**

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<b>Date</b>	: 14 October 2013
<b>Total Marks</b>	: 100
<b>Examination Time</b>	: 150 minutes (2.5 hours)
<b>Reading Time</b>	: 15 Minutes (prior to examination time)

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**GENERAL INSTRUCTIONS:**

1. Write your Roll Number clearly and correctly on the Answer Booklet.
2. The first 15 minutes is being provided to check the number of pages of Question Paper, printing errors, clarify doubts and to read the instructions. You are NOT permitted to write during this time.
3. This paper consists of **TWO SECTIONS**, namely SECTION A and SECTION B:
  - **SECTION A** has two parts:      Part I -      30 Multiple-Choice Questions  
  Part II -      4 Short Answer Questions  
All questions under SECTION A are COMPULSORY.
  - **SECTION B** consists of two Case Studies. Choose only ONE case study and answer the questions under your choice.
4. All answers should be written with correct numbering of Section, Part and Question Number in the Answer Booklet provided to you. Note that any answer written without indicating any or correct Section, Part and Question Number will NOT be evaluated and no marks would be awarded.
5. Begin each Section and Part in a fresh page of the Answer Booklet.
6. You are not permitted to tear off any sheet(s) of the Answer Booklet as well as the Question Paper.
7. Use of any other paper including paper for rough work is not permitted.
8. You are required to hand over the Answer Booklet to the Invigilator before leaving the examination hall.
9. This paper has **07** printed pages in all, including this instruction page.

**GOOD LUCK!**

## SECTION A

### PART I - Multiple Choice Questions (30 Marks)

Choose the correct answer and write down the letter of the correct answer chosen in the Answer Booklet against the question number. E.g. 31 (c). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.

1. All the energy in a food chain originates from
  - a. The plant
  - b. The sun
  - c. The farmer
  - d. The sea
  
2. Blue sheep are voracious grazers, playing some role in grassland habitat. If their population is reduced greatly through hunting what would happen?
  - a. There will be more grass for yaks
  - b. Some important grassland butterfly species would be lost
  - c. Grassland will be invaded by trees and shrubs
  - d. All of above
  
3. Weeds compete with crops for resources. They can be controlled by using
  - a. Herbicide
  - b. Insecticide
  - c. Rodenticide
  - d. Fungicide
  
4. If a pesticide got into a lake which organism would have the highest residue level?
  - a. Osprey
  - b. Fish
  - c. Microscopic animals
  - d. Microscopic plants
  
5. Fertilisers can get washed into water bodies such as rivers and lakes. This can cause
  - a. Biodegradation
  - b. Eutrophication
  - c. Bioaccumulation
  - d. None of above
  
6. UG99 is a disease of the
  - a. Rice
  - b. Wheat
  - c. Potato
  - d. Sugarcane

7. Crop rotation helps to
  - a. Lessen moisture stress
  - b. Increase yield
  - c. Produce a greater choice of crop products
  - d. Lessen parasites which have selective hosts
  
8. All the essential nutrients required by plants are taken up in
  - a. Organic form
  - b. Inorganic form
  - c. Mixture of organic and inorganic form
  - d. All of above
  
9. Which of the following 'essential' nutrients are not essential for some plant species
  - a. Ca
  - b. S
  - c. Na
  - d. Zn
  
10. Normal application rate of sulphur for most crops is
  - a. 0-9 kg/ha/yr
  - b. 10-50 kg/ha/yr
  - c. 60-100 kg/ha/yr
  - d. 100-150 kg/ha/yr
  
11. Which of the following elements are not essential nutrients for plants, rather can even cause toxicity?
  - a. Iodine
  - b. Fluorine
  - c. Nickel
  - d. All of above
  
12. Gypsum is a good source of
  - a. N
  - b. Ca
  - c. P
  - d. K
  
13. The chemical formula for urea is
  - a.  $\text{NH}_4\text{NO}_3$
  - b.  $\text{CO}(\text{NH}_2)_2$
  - c.  $(\text{NH}_4)_2\text{SO}_4$
  - d.  $\text{NH}_3$
  
14. Swede is a kind of
  - a. Vegetable crop
  - b. Fodder crop

- c. Brassica species
  - d. All of above
15. Lucerne, a fodder legume is also known as
- a. triticale
  - b. alfalfa
  - c. leek
  - d. allium
16. Hemp (*Cannabis sativa*) can be grown to produce
- a. fibre
  - b. drugs
  - c. pig fodder
  - d. all of above
17. Which of the following is good choice for coppicing
- a. Blue pine
  - b. Willow
  - c. Walnut
  - d. Poplar
18. Standard error is the standard deviation of
- a. The population
  - b. The sampling distribution
  - c. The sample
  - d. None of above
19. *Jatropha* is found aplenty in Bhutan's sub-tropical areas. It is very good for
- a. Fodder production
  - b. Medicinal properties
  - c. Biofuel production
  - d. Making furniture
20. A flail is used in the villages for
- a. Weeding
  - b. Drying grains
  - c. Sieving flour from coarse grains
  - d. Threshing
21. Chili is a native of
- a. Europe
  - b. North America
  - c. Asia
  - d. South America

22. The metabolizable energy content of maize grain is in the range
- 2-4 MJ/kg DM
  - 6-8 MJ/kg DM
  - 12-14 MJ/kg DM
  - 18-20 MJ/kg DM
23. Mushrooms are
- Plants
  - Fungi
  - Protozoa
  - Animals
24. Legumes prefer
- Neutral soil
  - Alkaline soil
  - Acidic soil
  - All of above
25. Soil salinity can be caused by
- Overuse of urea fertilizer
  - Lack of crop rotation
  - Frequent plowing
  - Deep irrigation
26. The wettest place (receiving highest average rainfall) on Earth is
- Mawsynram, India
  - Cherapunji, India
  - Emai Shan, China
  - Tutunendo, Colombia
27. Which of the following term is used by opponents of GM food?
- Bioengineered food
  - Genetically modified food
  - Nanotechnology food
  - Frankenfood
28. Which of the following countries has a complete ban on GM food?
- Norway
  - Sri Lanka
  - Japan
  - Egypt
29. Dolly the sheep was the first cloned animal. In which country did this take place?
- USA
  - Japan
  - UK
  - Germany

30. Crop harvest index is defined as
- Economic yield  $\div$  Total biomass
  - Grain yield per unit area
  - (Total biomass X grain yield)  $\div$  harvested area
  - $\sqrt{\text{Grain yield} \div (\text{Vegetative yield})^2}$

**PART – II : Short Answer Questions (20 marks)**

**Answer ALL the questions. Each question carries 5 marks. Mark for each sub-question is indicated in the brackets.**

- Write five important features of organic fertilizers.
- In Bhutan farmyard manure (FYM) is an important source of crop nutrients.
  - Mention two factors that determine the nutrient value of FYM? (2 marks)
  - Give two methods to reduce the risk of Salmonella infection due to FYM application on pasture or crops? (2 marks)
  - Which element would be found most in cattle manure – N, P or K? (1 mark)
- In agriculture, the term cover crop is quite common. Many farmers employ cover crops in their farming system.
  - What is a cover crop? (1 mark)
  - Give three functions of a cover crop. (3 marks)
  - Give an example of a suitable cover crop. (1 mark)
- The knowledge of soil is of primary importance to farmers and agriculture development workers. Write true or false against the following statements.
  - Soil texture relates to organic component of the soil. (1 mark)
  - Soil texture can be rapidly determined in the field by hand. (1 mark)
  - Applying lime to soil decreases soil pH. (1 mark)
  - Most soils of Bhutanese farms are deficient in phosphorus. (1 mark)
  - Clayey soils are good for crops during drought. (1 mark)

**SECTION B**  
**Case Study**

**Choose either Case 1 or Case 2 from this Section. Each Case carries 50 marks. Mark for each sub-question is indicated in the brackets.**

**CASE 1**

Bhutan is currently on the fence with regard to joining WTO or not. If you were an advisor to the current government of Bhutan, what will be your recommendation, particularly in the context of agricultural goods? Give justifications for your recommendation.

**CASE 2**

In Bhutan nowadays cases of wild animals like monkeys, wild boars or elephants attacking crops; and leopards and tigers preying on domestic animals are all too common issues in the rural areas. The food security of farmers is threatened. What could be the reasons for this surge in human-wildlife conflict? What are your observations with regard to how the Ministry of Agriculture and Forests is dealing with human-wildlife conflict? Give your own practical suggestions or ideas to deal with this issue.