

**ROYAL CIVIL SERVICE COMMISSION  
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2019  
EXAMINATION CATEGORY: TECHNICAL**

**PAPER III: SUBJECT SPECIALISATION PAPER FOR AGRICULTURE**

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<b>Date</b>	: October 13, 2019
<b>Total Marks</b>	: 100
<b>Writing Time</b>	: 150 minutes (2.5 hours)
<b>Reading Time</b>	: 15 Minutes (prior to writing time)

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**GENERAL INSTRUCTIONS:**

1. Write your Registration 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 & 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 of your choice.
4. All answers should be written on the Answer Booklet provided to you. Candidates are not allowed to write anything on the question paper. If required, ask for additional Answer Booklet.
5. 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 the Section, Part and Question Number will NOT be evaluated and no marks will be awarded.
6. Begin each Section and Part in a fresh page of the Answer Booklet.
7. You are not permitted to tear off any sheet(s) of the Answer Booklet as well as the Question Paper.
8. Use of any other paper including paper for rough work is not permitted.
9. **You are required to hand over the Answer Booklet to the Invigilator before leaving the examination hall.**
10. This paper has **7 printed pages**, 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 your chosen answer in the Answer Booklet against the question number e.g. 31 (d). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.

1. A susceptible variety is
  - a) which shows some range of damage done by pests.
  - b) which shows average or more than average damage.
  - c) which shows little or no resistance.
  - d) All of the above.
  
2. The Principle of SRI methods are
  - a) rice field soil is kept moist, and anaerobic condition is minimized.
  - b) rice field soil is kept saturated, and anaerobic condition is maximized.
  - c) 21 days old seedlings are transplanted with just 3 leaves.
  - d) both (b) and (c).
  
3. The hypothesis of “No difference” is known as
  - a) Simple hypothesis
  - b) Null hypothesis
  - c) Composite hypothesis
  - d) Alternative hypothesis
  
4. Which of the following is the smallest order of class insecta?
  - a) Hemiptera
  - b) Odonata
  - c) Zoptera
  - d) Coleoptera
  
5. The quickest method of plant breeding is
  - a) Introduction
  - b) Selection
  - c) Hybridization
  - d) Mutation breeding
  
6. As per the agriculture Statistic 2017, the maximum area in Bhutan is under which of the following crops?
  - a) Rice
  - b) Maize
  - c) Potato
  - d) Wheat
  
7. Golden Rice is rich in
  - a) Vitamin A
  - b) Vitamin B
  - c) Vitamin C
  - d) Vitamin K

8. Genetically most pure seed is
- Certified seed
  - Breeder seed
  - Nucleus seed
  - Foundation seed
9. Generally, standards in 'Organic Farming' are designed to encourage the use of
- manmade substances.
  - synthetics substances.
  - natural substances.
  - genetically modified substances.
10. What are the three pillars of sustainable development?
- Economic growth + Fair judicial systems + Education for everyone.
  - Social equity + Economic growth + Environmental protection.
  - Environmental protection + Eradicating poverty + Education for everyone.
  - None of the above.
11. When was FAO established?
- 1945
  - 1950
  - 1963
  - 1971
12. Transpiration is least in
- good soil moisture.
  - high wind velocity.
  - dry environment.
  - high atmospheric humidity.
13. Gibberellins promote
- seed germination.
  - fruit colour.
  - leaf fall.
  - root elongation.
14. Which one of the following increases in the absence of light?
- Uptake of minerals.
  - Uptake of water.
  - Elongation of internodes.
  - Ascent of sap.
15. The agricultural price support programme is an example of
- Price ceiling.
  - Price floor.
  - Equilibrium pricing.
  - None of the above.

16. Which of the following best defines price discrimination?
- Charging different price on the basis of race.
  - Charging different price for goods with different cost of production.
  - Charging different price based on cost of service differences.
  - Selling a certain product of given quality and cost per unit at different prices to different buyers.
17. The law of demand states that
- as the quantity demanded rises, the price rises.
  - as the price rises, the quantity demanded rises.
  - as the prices rises, the quantity demanded falls.
  - as the supply rises, the demand rises.
18. Population genetics is based on
- principle of population control.
  - Mendel's law.
  - Hardy wienberg's law.
  - genotype-environment inter action.
19. True Potato seed is the
- potato tuber used for propagation.
  - seed developed within the fruit of potato.
  - certified potato tuber sold by seed company.
  - any plant part used for potato propagation.
20. What percentage of employed population is engaged in agriculture sector as per the 2018 Labour Force Survey Report of Bhutan?
- 75%
  - 69%
  - 54%
  - 45%
21. *Fagopyrum esculentum* is the botanical name of
- Quinoa
  - Finger millet
  - Buckwheat
  - Horse gram
22. Yangtsipa is a popular Bhutanese variety of
- Potato
  - Maize
  - Paddy
  - Chilli

23. *Triticum aetivum*, the common bread wheat is
- Diploid
  - Haploid
  - Hexaploid
  - Tetraploid
24. What was the first transgenic crop?
- Cotton
  - Tobacco
  - Rice
  - Maize
25. Light reaction of photosynthesis converts light energy to chemical energy in the form of
- ATP
  - ATP & NADPH
  - NADPH
  - ATP & NADH
26. *Malus sieversii* is the wild species of
- Peach
  - Plum
  - Wood apple
  - Apple
27. Which is more important in drip irrigation?
- Valves
  - Emitters
  - Pipes
  - All of the above.
28. Which one of the following is not a PRA tool?
- Transect walk
  - Resource mapping
  - Venn Diagram
  - Mind mapping
29. There are \_\_\_\_\_ Agriculture Research Centres in Bhutan.
- nine
  - seven
  - four
  - five
30. Isothiocyanate is the cause of pungency in
- Onion
  - Garlic
  - Radish
  - Chilli

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

**This part has 4 Short Answer Questions. Answer ALL the questions. Each question carries 5 marks.**

1. What is Sustainable Development?
2. What you understand by Climate Change? Share your view on how climate change is affecting agriculture sector in Bhutan?
3. Define farming systems, cropping systems and cropping pattern. Describe anyone of the major cropping systems of Bhutan.
4. What is organic farming? Briefly describe four principles of Organic farming.

**SECTION B: Case Study**

**Choose either Case I OR Case II from this section. Each case study carries 50 marks. Mark for each sub-question is indicated in the brackets.**

**Case I**

Rice is a major staple for Bhutanese population and currently Bhutan is approximately 45% self-sufficient. During the 12<sup>th</sup> Five Year Plan, Ministry of Agriculture and Forest has set up an ambitious plan to increase the sufficiency level to 60%.

In this context, answer the following:

1. Define the following: (5 marks)
  - a) Food Security
  - b) Food Self-sufficiency
2. Recently “Global Food Policy Report – 2019” published by International Food Policy Research Institute (IFPRI) was launch in Bhutan and the report emphasizes on Rural Revitalization as key to food security. Briefly explain what you understand by Rural Revitalization and why it is important for food security? (10 marks)
3. Discuss in details the strategies for the Ministry to enhance rice production to achieve the targeted sufficiency level. (35 marks)

**Case II**

The use of digital technologies in Agriculture has been increasing at a rapid pace worldwide. The reason for increasing it is that it provides tremendous value and opportunities to improve the way we farm and conduct agriculture business. However, application of digital technologies in Bhutanese agriculture is limited.

In relation to promoting digital technologies in Agriculture, answer the following:

1. What you understand by digital Agriculture? (5 marks)
2. Define precision farming. (5 marks)
3. Following the success of past green revolution involving plant breeding to develop high yielding varieties and use of inputs, third green revolution is taking over agriculture. Briefly discuss what you understand by Third Green revolution. (5 marks)
4. There are some basic conditions that must exist for the use of digital technologies and therefore for digital transformation of the agriculture and food sector. List and briefly describe the basic conditions required for digital transformation in Agriculture sector. (5 marks)
5. List down and discuss in detail the opportunities and challenges of promoting digital technologies in Bhutanese Agricultural systems. (30 marks)

**TASHI DELEK**