ROYAL CIVIL SERVICE COMMISSION BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2020 EXAMINATION CATEGORY: TECHNICAL

PAPER III: SUBJECT SPECIALISATION PAPER FOR AGRICULTURE

Date : February 27, 2021

Total Marks : 100

Writing Time : 150 minutes (2.5 hours)

Reading Time : 15 Minutes (prior to writing time)

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 the 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 on 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 must 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.	Which of the following central tendency should be used to represent the soil type of any locality? a) Mean b) Median c) Mode d) All of the above
2.	Which one of the following is NOT a PRA tool? a) Transect walk b) Resource mapping c) Mind mapping d) Venn Diagram
3.	One decimal of land is equal to square meter. a) 40.5 b) 45.5 c) 35.5 d) 50.5
4.	Self-pollination is a form of a) Inbreeding b) Outbreeding c) Random mating d) None of the above
5.	According to the RNR census 2019, the reported fallow agricultural land in the country is about acre. a) 55000 b) 66000 c) 77000 d) 88000
6.	The scientific study of fungi is known as a) Parasitology b) Phycology c) Mycology d) Myology

- 7. Corylusavellana is a scientific name for
 - a) Arecanut
 - b) Chestnut
 - c) Cashew
 - d) Hazelnut
- 8. The alternative form of a gene is known as
 - a) Transgene
 - b) Mixed gene
 - c) Psuedogene
 - d) Alleles
- 9. Whiptail in cauliflower is caused due to
 - a) excess of boron.
 - b) deficiency of boron.
 - c) excess of molybdenum.
 - d) deficiency of molybdenum.
- 10. Powdery mildew disease is caused by
 - a) Bacteria
 - b) Fungus
 - c) Virus
 - d) None of the above
- 11. Which of the following is not an essential micronutrient for plant growth?
 - a) Iron
 - b) Zinc
 - c) Magnesium
 - d) Manganese
- 12. When we say maize belongs to Poaceae, we are referring to its
 - a) Order
 - b) Family
 - c) Sub-family
 - d) Genus
- 13. Organic carbon is a measure of
 - a) Available n in soil
 - b) Available p in soil
 - c) Available k in soil
 - d) Available mg in soil
- 14. UG-99 is a serious disease of the
 - a) Rice
 - b) Wheat
 - c) Chilli
 - d) Buckwheat

- 15. What is the role of Rhizobium bacteria found in the nodules on the legume plants?
 - a) They provide energy for root growth.
 - b) They provide an available source of nitrogen to the plant.
 - c) They provide resistance to plant pathogens.
 - d) They assist in absorbing water and plant nutrients.
- 16. When is the World Soil day celebrated?
 - a) December 5
 - b) October 16
 - c) June 5
 - d) June 17
- 17. A farmer decides to stop growing a crop A and instead use the land to grow crop B. The amount of potential profit lost by not growing crop A represent the farmer's
 - a) Opportunity costs
 - b) Variable costs
 - c) Marginal cost
 - d) Fixed costs
- 18. Cropping pattern is define as
 - a) the proportion of area under different crops.
 - b) growing different crops in a recurrent succession.
 - c) the proportion of area under different crops at a particular point of time.
 - d) a method of growing different crops.
- 19. "Yusi Map" is an improved Bhutanese variety of
 - a) Rice
 - b) Apple
 - c) Potato
 - a) Strawberry
- 20. Monili form antennae is in
 - a) Termite
 - b) Cockroach
 - c) Beetle
 - d) Grasshopper
- 21. Which of the following is not an essential amino acid?
 - a) Histidine
 - b) Proline
 - c) Leucine
 - d) Methionine

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 22. Hybrid is also known as a) Homozygous b) Heterozygous c) Often homozygous d) None of the above 	
 23. A farmer in Punakha planted rice as first crop and after harvesting it, he introduced pota second crop in the field. This type of cropping pattern is known as a) Relay b) Sequential c) Mix d) Differential 	to as
 24. Minimum, optimum and maximum temperature for growth of individual plant is called a) Average temperature b) Suitable temperature c) Cardinal temperature d) Kelvin temperature 	
25. At low pH or acidic condition, gets fixed in the soil. a) nitrogen b) potassium c) phosphorus d) hydrogen	
 26. Potato is propagated through a) Tuber b) Micro tuber c) TPS (True Potato Seed) d) All of the above 	
27. The response of the plant to the relative length of day and night is calleda) Thermoperiodism	

- b) Photoperiodismc) Light intensityd) Day length

- 28. Foundation seed is produced from
 - a) Nucleus seeds

 - b) Quality seedsc) Breeder seeds
 - d) Certified seeds

29. According to the	Bhutan Labour Force Survey report 20	2018, the	agriculture	sector	provides
employment to	percentage of employed populatio	on.			

- a) 70%
- b) 54%
- c) 60%
- d) 48%
- 30. A plant bearing both male and female flower on the same plant is called
 - a) Diocious
 - b) Monocious
 - c) Polygamous
 - d) None of the above

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 Composting? Briefly explain how compost improves the Soil. (2+3 marks)
- 2. What you mean by agro-forestry? Briefly discuss its ecological and economic benefits in Bhutanese farming system. (1+4 marks)
- 3. Briefly describe the following terms. (5x1 marks)
 - a) Saprophyte
 - b) Carbon sink
 - c) Backcross breeding
 - d) Permanent wilting percentage
 - e) Disease triangle
- 4. What do you mean by *Organic Standards* and *Certified Organic* in the context of organic farming? Describe briefly the LOAS and Third Party organic certification system available in Bhutan. (1+1+3 marks)

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

Climate change is a global concern and food & agriculture is often considered as the cause of and solution for climate change. Bhutan is not spared from its impact too. Over the years, we have observed changing patterns of climate and many extreme weather events. In this context:

- 1. Briefly define climate change and global warming and describe why Food and Agricultural sector is considered cause of climate change. (10 marks)
- 2. Discuss the effects of climate change on the four pillars of food security. (20 marks)
- 3. Explain how Bhutanese agriculture is vulnerable to climate change. (20 marks)

CASE II

Despite decades of plans to promote food self-sufficiency, Bhutan still remains hugely dependent on food import to meet the demand of the population. The urgency to enhance self-sufficiency in food production is felt even greater due to event like Covid-19 pandemic and its impact.

In view of above scenario and the country's desire to attain food self-sufficiency, discuss major *issues* leading to continued import of food with focus on rice and vegetables and suggest your strategy in details to mitigate it and enhance food self-sufficiency. (25+25 marks)

TASHI DELEK