

ROYAL CIVIL SERVICE COMMISSION
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2012
EXAMINATION CATEGORY: TECHNICAL

PAPER III: SUBJECT SPECIALIZATION PAPER for AGRICULTURE

Date	: 14 October 2012
Total Marks	: 100
Examination Time	: 150 minutes (2.5 hours)
Reading Time	: 15 Minutes (prior to examination time)

READ THE FOLLOWING INSTRUCTIONS CAREFULLY:

1. Write your Roll Number clearly on the Answer Booklet in the space provided.
2. The first 15 minutes is being provided to check the number of pages, printing errors, clarify doubts and to read the instructions. You are NOT PERMITTED TO WRITE during this time.
3. Use either Blue or Black ink pen or ball point pen for the written part and Pencils for the sketches and drawings.
4. All answers should be written on the Answer Booklet provided. Candidates are not allowed to write anything on the question paper or any other materials.
5. This paper is divided into two sections-namely SECTION A and SECTION B.
6. SECTION A consists of two parts: Part I and Part II.

Part I consists of 30 Multiple-Choice Questions carrying one (1) mark each and is compulsory. The answer of your choice should be clearly written in whole along with the question and option number on your answer booklet. Eg. 31(c).

Part II consists of four (4) short answer questions of five (5) marks each and all questions are compulsory.

7. SECTION B consists of two Case Studies. Choose only ONE case study and answer the questions under your choice. Each case study carries fifty (50) marks in total.
8. This Paper consists of seven (7) pages including this Instruction page.

Section A Part I: Answer all following 30 multiple-choice questions (1 mark each)

1. Phosphorus in plants is associated with which of the following role
 - a. Transfer and storage of energy
 - b. Efficient water relationships
 - c. Formation of essential amino acids
 - d. Formation of cell walls

2. Shifting cultivation is also known as
 - a. Organic agriculture
 - b. Swidden agriculture
 - c. Conservation agriculture
 - d. Conventional agriculture

3. Foal is an offspring of
 - a. Goat
 - b. Horse
 - c. Pig
 - d. Buffalo

4. Which of the following is a zoonotic disease
 - a. Anthrax
 - b. Foot and mouth disease
 - c. Bovine Johne's disease
 - d. Gid

5. Which of the following cattle type is associated with migratory pastoralism in Bhutan
 - a. Jersey
 - b. Brown Swiss
 - c. Siri
 - d. Ayrshire

6. Which of the following is not true
 - a. Organic agriculture seeks to eliminate chemical and inorganic inputs
 - b. Organic agriculture seeks to reduce chemical and inorganic inputs
 - c. Organic agriculture seeks to promote soil micro-organisms
 - d. Organic agriculture is synonymous with sustainable agriculture

7. Scientific name of tapioca is
 - a. Capsicum annum
 - b. Sollarum tuberosa
 - c. Manihot esculenta
 - d. Triticum aestivum

8. World Food Day is celebrated in honour of
 - a. Food and Agriculture Organization
 - b. United Nations Development Program
 - c. World Food Program
 - d. None of above

9. World Food Day is celebrated on
 - a. 16 October
 - b. 16 November
 - c. 16 December
 - d. 16 January

10. Triticale is the hybrid of
 - a. Wheat and barley
 - b. Wheat and oat
 - c. Wheat and rye
 - d. Barley and rice

11. What is the main purpose of pruning fruit trees?
 - a. To have beautiful canopy shape
 - b. To maximize quality of fruits
 - c. To maximize quantity of fruits
 - d. To avoid fruit drop before harvest

12. When making silage for winter feeding of animals, the most important thing is to
 - a. Make the whole thing as anaerobic as possible
 - b. Make the whole thing as aerobic as possible
 - c. Aim for maximum production of butyric acid
 - d. None of above

13. Which of the following country is currently the largest producer of milk
 - a. USA
 - b. China
 - c. India
 - d. Australia

14. As of 2010, the share of agriculture to Bhutan's GDP is
 - a. 7.9%
 - b. 16.8%
 - c. 22.3%
 - d. 65.8%

15. In analyzing the effect of fertilizer levels on yield of crops, the yield variable is
- Independent
 - Dependant
 - Dummy
 - Covariable
16. Which of the following British visitor to Bhutan is often credited with the introduction of potato in Bhutan
- Ashley Eden
 - Samuel Turner
 - George Bogle
 - Hooker
17. Which of the following person is regarded as “Father of the Green Revolution”
- John Deere
 - Norman Borlaug
 - George Harrison Shull
 - Henry A. Wallace
18. In which of the following crop was the first genetically modified organism produced?
- Cotton
 - Tobacco
 - Soybean
 - Sugarcane
19. Which of the following is a mixture of decomposed organic matter and is usually dark in colour?
- Clay
 - Humus
 - Loam
 - Podzol
20. Soil acidity is measured by the concentration of which ion?
- Magnesium
 - Sodium
 - Hydrogen
 - Calcium
21. Which system is commonly used to describe the colour of a soil?
- USDA soil type table
 - FAO soil classification chart
 - Munsell colour chart
 - Fluorimeter

22. The advantages of transplanting are
- It increases crop production
 - Seedlings can be planted at proper distance
 - The farmer can select only the healthy seedlings
 - All of above
23. Which of the following types of manure is obtained by the decomposition of plants and dead animals?
- Compost
 - Green manure
 - Farmyard manure
 - All of them
24. Burrowing of soil by earthworms will
- Dissolve plant nutrients present
 - improve soil drainage, aeration and soil structure
 - help in photosynthesis and microbes living in the soil
 - provide mechanical support and nutrients to plants
25. The main reason for record keeping in the management of agricultural enterprises is to gain
- data for management analysis
 - information for production and marketing
 - information for making management decisions
 - data for determining the profitability of an enterprise
26. Post-harvest handling is important for maintaining and promoting product
- texture and ripeness
 - freshness and aroma
 - quantity and added value
 - quality and market requirements
27. Drenching animals is a method for
- separation based on performance
 - treatment using tube to the stomach
 - breeding by artificial insemination
 - marking with tags for identification
28. Which of the following is a common disease of poultry?
- Mastitis
 - Coccidiosis
 - Scrapie
 - Blackquarter

29. Which of the following is not an essential element for plant growth?

- a. Boron
- b. Iodine
- c. Zinc
- d. Copper

30. Nitrogen fixation by legumes need

- a. Phosphorus
- b. Magnesium
- c. Calcium
- d. Molybdenum

Section A Part II: Answer all 4 questions (5 marks each)

1. Aum Tashi Lham noticed that her barley plants were showing unusual leaf colouring and concluded that they were symptoms of nutrient deficiencies. She took some samples to the lab at Semtokha to be checked and was told that her plants were showing symptoms of potassium deficiency.
 - a. Give two symptoms that Aum Tashi Lham would have seen. (2 marks)
 - b. Give two functions of potassium in plant growth (2 marks)
 - c. Which of the following nutrient group does potassium belong to (1 mark)
 - i. Micro-nutrient
 - ii. Macro-nutrient
2. Fill in the blanks (5 marks). *Note – write answers on your answer booklet/sheet.*
 - a. The process of separating the grains from the chaff by means of a current of air is called
 - b. Crop diseases can be divided into four general groups. They are air-borne, soil-borne, seed-borne and
 - c. An adult female pig is called
 - d. OGTP is a strategy pursued by the Ministry of Agriculture, Bhutan. OGTP stands for
 - e. Irrigation system in which water drops are placed right at the roots of plants by means of a network of valves, pipes and tubing in order to save water is called
3. The acidity or alkalinity of a soil exerts a strong influence on the nutrient availability and uptake, and hence on crop growth.
 - a. How does a soil become acidic over time? (2 mark)
 - b. How does acidic soil affect plant growth? (2 marks)
 - c. Mention one remedial action to improve acidic soils (1 mark)

4. Match the following 5 classes of plant hormones with their main functions (5 marks).

Classes of plant hormones	Main functions
(a) Auxins	(1) Release apical dominance, prevent senescence, mobilize nutrients.
(b) Cytokinins	(2) Cell elongation, cell division, prevent abscission
(c) Gibberellins	(3) Stomatal closure, induces dormancy, control of embryo development.
(d) Ethylenes	(4) Cell elongation (particularly stem extension), inhibit organ formation, accelerate germination
(e) Abscicic acid	(5) Ripening of fruit, senescence, epinasty.

Section B: Attempt only ONE of the following two case studies (50 marks).

1. Ecosystems can be categorized as forest ecosystem, aquatic ecosystem and agricultural ecosystem. Describe what is an ecosystem? Describe the important features of each of the three ecosystems mentioned above in the context of Bhutan, including opportunities and threats.

OR

2. Bhutan is seeking to adopt 100% organic agriculture in the near future. What is your opinion on this?

----- END OF QUESTION PAPER -----