ROYAL CIVIL SERVICE COMMISSION
BHUTAN CIVL SERVICE EXAMINATION (BCSE) 2011
EXAMNATION CATEGORY: TECHNICAL

PAPER III: SUBJECT SPECIALIZATION PAPER FOR AGRICULTURE

Date	: 30th October, 2011
Total Marks	: 100
Examination Time	: 2.5 Hours
Reading Time	: 15 Minutes

INSTRUCTIONS

1. Write your Roll Number clearly on the answer booklet/Sheet in the space provided

2. The first 15 minutes is being provided to check the number of pages, printing error, clarify doubts and to read instructions. You are NOT PERMITED TO WRITE during this time.

3. Use either Blue or Black ink pen or Ball Point pen for written part and H.B. Pencils for sketches and drawings.

4. All answers should be written on the Answer Booklet/Sheet provided. Candidates are not allowed to write anything on the question paper.

5. The Question Booklet/Sheet consists of eight (8) pages including this page and no pages shall be removed or torn. Any pages found mission should be reported to the invigilators within the first 15 minutes of receipt of the question book.

6. It is divided into two sections – SECTION A and SECTION B as detailed in the following para(s) 7 and 8.

7. SECTION A consists of two parts, Part I and Part II.

    a. 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/sheet.

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

8. SECTION B consists of two case studies. Choose only case studies and answer the question of your choice. Each case study carries fifty (50) marks in total.

SECTION A:

Part I : 30 multiple choice questions of one mark each (total marks: 30)

1. Stomata found in the leaf and stem epidermis are used for:

    a. Nutrient exchange
    b. Water exchange
    c. Gas exchange
    d. None of the above

2. Photosynthesis takes place in:

    a. Chloroplast
    b. Cuticle
    c. Bundle sheath
    d. Guard Cell

3. Application of fertilizers, soil amendments, or other water soluble products through an irrigation system is called:

    a. Drip irrigation
    b. Sprinkler irrigation
    c. Fertigation
    d. Soil fumigation

4. The process of wearing away of the soils and land surface by physical forces (rainfall, flowing water, wind etc.) and anthropogenic agents from one point of the earth's surface and deposited elsewhere is called;

    a. Soil deposition
    b. Soil formation
    c. Soil erosion
    d. Soil transportation

5. Cation – Exchange Capacity (CEC) is one way to determine soil fertility. Which soil types indicated in the table below is likely to be more fertile?

Soil Types	CEC (in meq/100g soil)
Soil A	20
Soil B	40
Soil C	100
Soil D	80

6. Mulching is one of the agronomic recommendations. What is its appropriate function or functions?

    a. It helps to control weeds
    b. It helps to control the spread of pests and diseases
    c. It helps to keep the soil cool and moist to enhance the growth and early establishment of vegetation
    d. None of the above

7. What are the macro-nutrients required for the plants?

    a. N, P, K, Ca, Mg, S
    b. N, P, K, Ca, Zn, Fe
    c. N, P, K, Fe, Cl, Cu
    d. N, P, K, Fe, Mg, Zn

8. Organic matter that has been decomposed and recycled as a fertilizer and soil amendment is called:

    a. Chemical fertilizers
    b. Weedicide
    c. Pesticides
    d. Compost

9. Which among the following statement is true for *Conservation Tillage* or *Zero Tillage* technique?

    a. It is costly and reduces yield
    b. It increases the risk of soil erosion and water loss
    c. It improves soil organic contents but results into soil compaction in the long run
    d. It increases the amount of water and organic matter in the soil and decreases erosion.

10. A gas in an atmosphere that absorbs and emits radiation within the thermal infrared range is called;

    a. Green house gas (GHG)
    b. Liquefied petroleum gas
    c. Natural gas
    d. Artificial gas

11. The country continues to import rice from other countries to meet the internal demand. What was the quantity of rice imported in 2009?

    a. 53,471 MT
    b. 50,000 MT

c. 40,000 MT
d. 45,000 MT

12. Rice blast is one of the important diseases in rice in the country. The disease is caused by:

    a. Fungus
    b. Bacteria
    c. Virus
    d. Nematodes

13. Rice hybrids are the F1 progeny of crosses between:

    a. Rice varieties having same genetic attributes
    b. Rice and Maze with different genetic attributes
    c. Rice and wheat with similar genetic attributes
    d. Rice varieties having different genetic attributes

14. International Rice Research Institute, a part Consultative Group on International Agriculture is based in which country?

    a. Bhutan
    b. United States of America
    c. Brazil
    d. The Philippines

15. Maize is:

    a. C1 Plant
    b. C2 Plant
    c. C3 Plant
    d. C4 Plant

16. Turcicum Leaf Blight (TLB) is one of the important diseases in maize that has affected almost all maize growing Dzongkhags in the country. TLB is caused by:

    a. Exserohilum turcicum syn. Helminthosporium turcicum
    b. Cercospora zeae-maydis
    c. Tilletia caries or T. foetida
    d. Venturia Inaequalis

17. More than 11% of the maize crop is lost to wild animals each year. Which among the wild animals listed is the most important pest?

    a. Wild boar/Pigs
    b. Deer
    c. Blue Sheep

d. Takin

18. One of the current researches in maize focuses to genetically ameliorate the poor nutritional value, especially to enhance the content of essential amino acids. Such maize is known as:

    a. Quality maize product (s)
    b. Quality Protein Maize
    c. Hybrid Maize
    d. Processed Maize

19. CIMMYT is one of the international agriculture research organizations. What is their focus crop or crops?

    a. Maize and rice
    b. Maize and wheat
    c. Wheat and Barley
    d. Oat and millet

20. The national mandate of RNR RDC Bajo located in Wangdi Phodrang Dzongkhag is to co-ordinate;

    a. National field crop research
    b. National horticulture research
    c. National organic research
    d. National livestock research

21. In Bhutan cereal crops are generally classified as major and minor depending on area under cultivation and its level of contribution towards country's food security basket. Which are minor cereal crops?

    a. Maize and wheat
    b. Rice and millet
    c. Wheat and millet
    d. Rice and maize

22. Bulk density is an indicator of:

    a. Solar radiation
    b. High soil organism presence
    c. Percentage of stone contents in the soil
    d. Soil Compaction

23. Ministry of Agriculture and Forest is also referred to as RNR Sector. RNR stands for

    a. Re-useable Natural Resources
    b. Renewable Natural Resources
    c. Reuse N Recycle
    d. None of the above

24. Who is the Secretary of Ministry of Agriculture and Forest?

    a. Sherub Tenzin
    b. Sherub Rinchen
    c. Sherub Gyaltshen
    d. Sherub Dorji

25. There are three functional divisions under the Department of Agriculture. They are;

    a. Agriculture Division, Horticulture Division, Organic Division
    b. Agriculture Division, Fishery Division, Organic Division
    c. Agriculture Division, Horticulture Division, Engineering Division
    d. Agriculture Division, Horticulture Division, Social Forestry Division

26. MAP is the triple gem concept of the MoAF. MAP stands for

    a. Medicinal Plant and Aromatic Plants
    b. Marketing, Access and Production
    c. Mapping and Planning
    d. None of the above

27. One of the initiatives of the Ministry of Agriculture and Forest in the 10^{th} FYP is the implementation of OGTP activities. OGTP stands for:

    a. One Geog Two Products
    b. One Geog Three Products
    c. One Geog Ten Products
    d. One Geog Twenty Products

28. Regression analysis allows us to understand the relationship between a dependent variable and one or more independent variables. Understanding of such relationship can allow us to:

    a. Check the level of data accuracy
    b. Check the normal distribution of the data
    c. Predict and forecast
    d. None of the above

29. What percentage of land in the country is under cultivated agriculture area?

    a. 10%
    b. 20%
    c. 1%
    d. 2.93%

30. Agriculture system that relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects is called:

    a. Intensive agriculture
    b. Extensive agriculture
    c. Modern agriculture
    d. Organic agriculture

SECTION A

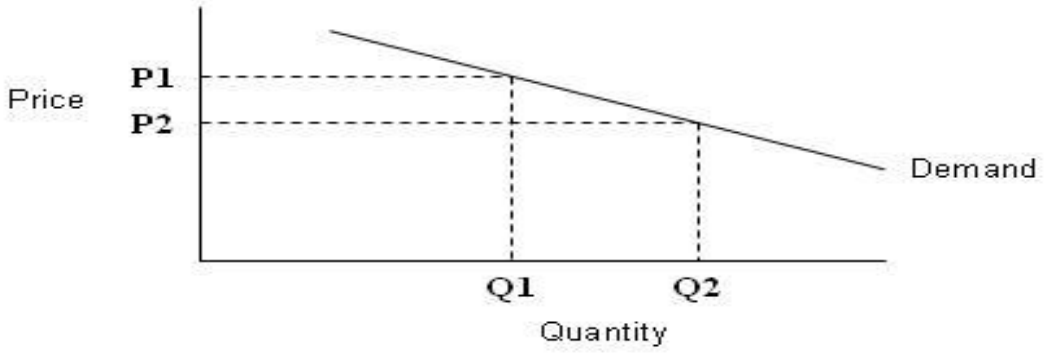
Part II : Four short questions of 5 marks each. Answer all the four questions.

1. What are the advantages of growing vegetables on raised bed?

2. Define seed treatment, and mention at least two benefits of treated seeds?

3. Soil erosion is one example of land degradation that affects Bhutan. What is land degradation? List two different ways in which soil erosions can be checked or contained, and also explain additional benefits?

4. The figure below represents elastic demand, where P represents *Price*, and Q represents *Quantity*. Explain using the figure what is elastic demand? Give one example of agriculture product with elastic demand and justify your choice of example.



SECTION B: Attempt only one of the following two case studies (50 marks)

1. One of the current concerns globally, regionally and nationally is *Climate Change*. What is climate change?

   While it is hotly debated among the scientist and academia alike, it is gene rally accepted that over the years our climate has changed greatly. What are the physical evidences or events in Bhutan that supports that climate has changed?

   Some argue that it will negatively affect agriculture and hence food security will be a concern. There are also expert groups who think it is good for agriculture. In your assessment, what are the opportunities and problems regarding agriculture in the context of climate change in Bhutan and hence food security?

OR

2. Since the start of agriculture development in the early 60's, Ministry of Agriculture and Forest has been pursuing the policy to attain "food security" or "food self sufficiency". However, considering the present trend of population growth and the import of cereal, especially rice (which is close to 50% of internal requirement annually), it is unlikely that we will achieve our policy goals. There is also an increase of rural – urban migration, aggravating already dwindling labour force in the villages. Further the available land for agriculture is limited and most are located on steep slopes which are prone to landslides, erosions etc.

   First, define "food security" and "food self sufficiency". Given the above short background on agriculture situations in the country, do you think we can achieve our policy objective s in the foreseeable future? Provide your arguments and also suggest strategies to achieve the policy objectives.

   If you think we cannot achieve our policy objectives, what are your suggestion for agriculture development in the country and provide strong arguments.