Michigan

TEST FOR TEACHER CERTIFICATION

STUDY GUIDE

37 Agricultural Education

MI-SG-FLD037-02

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National Evaluation Systems, P.O. Box 226, Amherst, MA 01004

PART 1: General Information About the MTTC Program and Test Preparation

The first section of the study guide is available in a separate PDF file. Click the link below to view or print this section.

General Information About the MTTC Program and Test Preparation

PART 2: Test Objectives and Sample Test Questions

INTRODUCTION

This section includes a list of the test objectives, immediately followed by sample test questions and an answer key for the field covered by this study guide.

Test Objectives

As noted, the test objectives are broad, conceptual statements that reflect the knowledge, skills, and understanding an entry-level teacher needs in order to teach effectively in a Michigan classroom. Each field's list of test objectives represents the **only** source of information about what a specific test will cover and, therefore, should be studied carefully.

The test objectives are organized into groups known as "subareas." These subareas define the major content areas of the test. You will find a list of subareas at the beginning of the test objective list. The percentages shown in the list of subareas indicate the approximate weighting of the subareas on the test.

Sample Multiple-Choice Test Questions

The sample multiple-choice test questions included in this section are designed to give the test-taker an introduction to the nature of the test questions included on the MTTC test for each field. The sample test questions represent the various types of test questions you may expect to see on an actual test; however, they are **not** designed to provide diagnostic information to help you identify specific areas of individual strengths and weaknesses or predict your performance on the test as a whole. Use the answer key that follows the sample test questions to check your answers.

To help you identify which test objective is being assessed, the objective statement to which the question corresponds is listed in the answer key. When you are finished with the sample test questions, you may wish to go back and review the entire list of test objectives and descriptive statements once again.

TEST OBJECTIVES

Subarea	Approximate Percentage of Questions on Test
Animal Science	22%
Plant and Soil Science	20%
Horticulture	22%
Agricultural Business and Management	20%
Agricultural Resources and Careers	16%

ANIMAL SCIENCE

Understand biological aspects of swine production.

Includes breeds of swine and their characteristics, anatomy, physiology, nutritional requirements, diseases, and parasites.

Understand biological aspects of beef and dairy cattle production.

Includes breeds of beef and dairy cattle and their characteristics, anatomy, physiology, nutritional requirements, diseases, and parasites.

Understand biological aspects of horse production.

Includes breeds of horses and their characteristics, anatomy, physiology, nutritional requirements, diseases, and parasites.

Apply principles of nutrition to livestock.

Includes types and characteristics of livestock feed; the purposes and characteristics of feed additives; the selection of appropriate feed and feeding schedules; and the effects of various feeds on animals and animal products.

Apply procedures to control the diseases and parasites of livestock.

Includes the symptoms of diseases; parasites and parasitic infestations affecting livestock; and methods of prevention and treatment, including legal restrictions.

Understand animal reproduction and breeding practices.

Includes factors involved in selecting breeding stock; the principles of genetics in breeding; and procedures related to breeding animals and parturition.

Understand livestock evaluation.

Includes criteria for evaluating livestock, live animals, and carcasses; and procedures for judging livestock.

Analyze methods of controlling the environment of livestock.

Includes the effect of the environment on livestock; appropriate facilities for raising and handling livestock; equipment and procedures for regulating temperature and humidity; and maintenance of sanitary conditions and waste management.

Understand livestock and poultry product processing.

Includes types of livestock and poultry products; wholesale and retail cuts; types and quality of product packaging; and the principles of quality control.

PLANT AND SOIL SCIENCE

Analyze the processes of plant growth and reproduction.

Includes plant nutrition and growth, including use of fertilizer; and the processes of photosynthesis, respiration, transpiration, and sexual and asexual reproduction in plants.

Identify the characteristics and uses of field crops.

Includes types and characteristics of field crops; crop varieties; market grades of crops; and major uses of field crops.

Analyze methods of preparing seedbeds and planting field crops.

Includes the uses and characteristics of various types of seedbed preparation and planting equipment; types of tillage systems and planting methods and their characteristics; and the selection of appropriate seedbed preparations, planting methods, and crop rotations in various situations.

Analyze methods of harvesting field crops.

Includes the uses and characteristics of various types of harvesting equipment; and the selection of harvesting methods in various situations.

Identify types of plant pests (e.g., insects, diseases, and weeds) and ways of controlling them.

Includes types and characteristics of plant pests; methods for the control of plant pests; and proper use, storage, and disposal of pesticides.

Identify types of soil and their composition.

Includes characteristics, classifications, and components of soil; biological, chemical, physical, and other factors affecting soil; and soil maps.

Understand drainage and irrigation.

Includes various drainage and irrigation methods and their characteristics and selection.

Apply soil-testing methods.

Includes procedures for taking soil samples; methods of soil testing and their characteristics; and soil-test reports.

Apply the principles of soil conservation.

Includes types and characteristics of soil erosion; methods of soil and water conservation; and topographic and land capability maps.

Understand crop product processing.

Includes types of crop products; wholesale and retail crops; types and quality of product packaging; and the principles of quality control.

HORTICULTURE

Identify horticultural plants and their uses.

Includes the classification of different types of horticultural plants; and characteristics and appropriate uses of various horticultural plants.

Analyze the characteristics of horticultural growing media.

Includes types of horticultural growing media and their characteristics, components, and selection; and methods of mixing media and improving soil fertility.

Analyze the growth requirements of horticultural plants.

Includes light, water, pH, nutrient, soil, and other special requirements of plants.

Apply procedures for planting, transplanting, propagating, maintaining, and harvesting horticultural plants.

Includes procedures for planting, transplanting, propagating, maintaining, and harvesting plants.

Identify types of horticultural plant pests (e.g., insects, diseases, and weeds) and ways of controlling them.

Includes types and characteristics of pests and plant diseases affecting horticultural plants; methods for their control; and the proper use, storage, and disposal of pesticides.

Understand the production of nursery plants.

Includes types of equipment and their uses in nurseries; types of plants and other products produced in nurseries; environmental factors affecting nursery production; and procedures for maintaining and improving nursery production.

Understand the production of greenhouse plants.

Includes types of equipment and their uses in greenhouses; types of plants and other products produced in greenhouses; and the facilities, design, and methods for controlling the greenhouse environment.

Understand the principles of floral design.

Includes types of plant materials, design materials, and basic designs.

Understand the principles of landscaping.

Includes design, planting, and maintenance techniques.

Understand the principles of turf management.

Includes types and uses of turf; turf production methods; and turf maintenance procedures.

AGRICULTURAL BUSINESS AND MANAGEMENT

Apply principles of economics in agricultural business.

Includes the principles of supply and demand; factors affecting market prices of agricultural products; the principles of economics involving production costs, labor, income, and profit; and the principles of competition in agricultural economics.

Understand the use of credit in agriculture.

Includes types and sources of credit and their characteristics; the total cost of credit agreements; and the causes and effects of changes in interest rates.

Apply business recordkeeping procedures.

Includes types of business records and their characteristics, including computerized systems; records required for employees; records required for taxes, and their uses; and the use of appropriate accounting procedures.

Analyze the role of the government in agriculture.

Includes the reasons for and effects of government subsidies; the influence of domestic and foreign demand on agricultural production; the role of the government in farm, land, and forestry management; and the historical basis of current problems in agriculture.

Analyze financial practices in agriculture.

Includes types of taxes and insurance and their effective costs in agriculture; and the causes and effects of financial problems in agriculture.

Apply procedures for scheduling and planning agricultural operations.

Includes factors involved in arranging employee work schedules; product and market planning; budgeting procedures; and business plans for various types of agricultural operations.

Understand business ownership.

Includes forms of business ownership and their characteristics and responsibilities; the advantages and disadvantages of incorporating a business; and types of agricultural businesses and their characteristics.

Identify methods of marketing agricultural products and services.

Includes types and characteristics of agricultural markets and marketing and distribution channels; regulations related to agricultural marketing; marketing strategies; and the influence of futures in agricultural marketing.

Apply the principles of marketing to agribusiness.

Includes types, uses, and costs of advertising; the principles of public relations in agribusiness; ways to establish and maintain good customer relations; and the principles of selling.

AGRICULTURAL RESOURCES AND CAREERS

Apply the principles of conservation.

Includes methods of conserving plants, forests, and wildlife and their habitats; and practices to promote soil conservation and water and air quality.

Understand forestry.

Includes types of trees and their characteristics; types of lumber and other products produced in forestry; procedures for estimating, measuring, and producing forestry products; and environmental factors that affect forestry production.

Understand ecology.

Includes the components, plant succession, climax vegetation, cycle of elements, and energy flow in an ecosystem; and the importance of ecological awareness in agricultural resource management.

Understand land-use issues.

Includes different types of land-use in the United States; processes involving the loss of farm land to nonfarm uses; and issues involved in increasing productive land.

Identify the characteristics and functions of vocational student organizations (e.g., FFA).

Includes the purposes of the organizations; the role and responsibilities of the advisor; and organizational activities.

Identify the characteristics and functions of supervised agriscience and natural resource experience programs.

Includes types of supervised student experience programs; and program records and their characteristics.

Identify career opportunities and requirements in agriculture.

Includes career areas, opportunities, job titles, and prerequisites for career areas in agriculture; and procedures for securing and maintaining employment in agriculture.

SAMPLE MULTIPLE-CHOICE TEST QUESTIONS

1. As part of a balanced ration for hogs, soybean meal is often used as a supplement to corn primarily to:

   A. provide a source of carbohydrates.

   B. correct the amino acid deficiencies of corn.

   C. serve as a vitamin supplement.

   D. provide the extra roughage that hogs require.

2. Which of the following considerations would be most important in selecting a bull for breeding stock?

   A. weight of the bull

   B. growth rate of the bull's progeny

   C. height of the bull

   D. total number of progeny already produced by the bull

3. To promote good production of leguminous crops such as soybeans, it is most important to subject the seeds to which of the following treatments before planting?

   A. inoculation with symbiotic bacteria

   B. cooling to just above freezing

   C. soaking in water overnight

   D. exposure to pure oxygen

4. A producer would like to improve the water-conserving ability of the soil on the farm's cropland. Which of the following steps would be most effective in achieving this goal?

   A. installing an irrigation system

   B. increasing the amount of chemical fertilizers used

   C. adding organic matter to the soil

   D. tilling the soil more thoroughly and frequently

5. Horticultural plants are being propagated in a greenhouse until they are large enough to be moved outside and hardened off. The plants are watered daily, but several of the plants are wilting and show signs of leafscorch. These plants do not appear to be suffering from any pathogenic diseases. Which of the following actions is most likely to improve the condition of the wilting plants?

   A. adjusting the pH of the watering solution

   B. increasing the intensity of the light to which the plants are exposed

   C. thinning the plants so there is more space between them

   D. increasing the humidity level in the greenhouse

6. To achieve the proper scale in a floral arrangement, it is most important to follow which of the following principles?

   A. The arrangement should have a single focal point.

   B. The flowers should be arranged symmetrically around a central axis.

   C. The arrangement should be one and one-half to two times the height or width of the container.

   D. The flowers should complement each other in color and shape.

7. An analysis of a farming enterprise shows a farmer that she is not taking full advantage of potential economies of scale. After implementing strategies to take greater advantage of such economies, the farmer is most likely to have succeeded in:

   A. increasing the variety of products produced.

   B. decreasing total farm labor requirements.

   C. increasing the market price for her products.

   D. decreasing per-unit production costs.

8. Which of the following would be the most effective advertising technique for a nationally known agricultural equipment firm to use to ensure that past and current customers are informed about an upcoming sale?

   A. network television advertising

   B. inserts in national newspapers

   C. direct mail advertising

   D. advertisements in national agricultural magazines

9. A stream on a farm runs adjacent to a cornfield. The stream then passes through a pasture and provides water for dairy cattle as they graze. To ensure the quality of the stream water, it would be most effective for the farmer to:

   A. minimize the use of chemical fertilizers and pesticides on the cornfield.

   B. dam the stream before it enters the pasture to allow sediments to settle out of the water.

   C. relocate the pasture to an area where the stream will not run through it.

   D. add chlorine to the water after it passes through the pasture to kill bacteria.

10. Which of the following careers deals primarily with the maintenance and renewal of natural resources?

   A. farm manager

   B. agricultural economist

   C. forester

   D. horticulturist

ANSWER KEY FOR THE SAMPLE MULTIPLE-CHOICE TEST QUESTIONS

Item Number	Correct Response	Objective
1.	**B**	Apply principles of nutrition to livestock.
2.	**B**	Understand animal reproduction and breeding practices.
3.	**A**	Analyze methods of preparing seedbeds and planting field crops.
4.	**C**	Apply the principles of soil conservation.
5.	**D**	Analyze the growth requirements of horticultural plants.
6.	**C**	Understand the principles of floral design.
7.	**D**	Apply principles of economics in agricultural business.
8.	**C**	Apply the principles of marketing to agribusiness.
9.	**A**	Apply the principles of conservation.
10.	**C**	Identify career opportunities and requirements in agriculture.