MODEL ANSWER
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SEMESTER END THEORY EXAMINATION

B.Sc. (Hons.) Agriculture

Semester	**:**	**IV (New)**	**Term**	**:**	**II**	**Academic Year**	**: 2020-21**
Course No.	**:**	**AGRO 247**	**Title**	**:**	**Farming Systems and Sustainable Agriculture**		
Credits	**:**	**1 (1+0)**					
Day & Date	**:**	**12.11.2021**	**Time**	**:**		**Total Marks**	**: 40**

Note:
1) Solve **ANY FOUR** questions from **SECTION-A**.
2) Solve **ANY SIX** questions from **SECTION-B**.
3) All questions from **SECTION-C** are compulsory.
4) Send the PDF file of answer sheet to the email id of respective course teacher.

SECTION-A

(Write the answers in 4-5 sentences only. Each question carries 4 marks)

Q. 1 Define cropping systems and give its classification.

Cropping system is cropping patterns used on a farm and their interactions with farm resources, other farm enterprises and available technology that determine their make-up. Individual crops are the components of a given cropping pattern/system.

In other words, a cropping system usually refers to a combination of crops in time and space. Combination in time occurs when crops occupy different growing period and combinations in space occur when crops are inter planted.

• Cropping systems has to be evolved based on climate, soil and water availability for efficient use of available natural resources.

• This cropping system should provide enough food for the family, fodder for cattle and generate sufficient cash income for domestic and cultivation expenses.

Types of cropping system

1) Monocropping 2) Multiple cropping 3) Fallowing or Fallow in rotation

1) Parallel Multiple cropping
1) Mixed cropping
2) Intercropping
3) Relay cropping
4) Alley cropping
5) Multistoried cropping

2) Sequential Multiple cropping
i. Sequential cropping
a) Double cropping
b) Triple cropping
c) Quadruple cropping
ii. Ratoon cropping/Ratooning

Q. 2 Write the advantages and disadvantages of subsistence farming

In subsistence farming virtually, there is no sale of crop and animal products, but used for home consumption. Subsistence farming is a type of farming where the farmers of our country cultivate the crop in their land for the livings. Hence, the holding is small in size; so improved method of cultivation is not possible. They fail to meet the total requirement. They reared cattle, poultry, along with crop cultivation in limited land meet their requirement.

Advantages:

1. Utilizing productive resources profitably.
2. Farmers with their family members engaged throughout the year as they rearing cattle, poultry etc.
3. Farmer meet their demand from the income from cattle, poultry etc.
4. By product used properly.

	Disadvantages: 1. Fails to adopt improved crop cultivation technique due to small holding. 2. Cultivation mainly depends on monsoon rain. 3. Procurement of seed, fertilizer as and when required is difficult. 4. Income of this farm is very low.
Q. 3	Define LEISA and enlist its techniques for sustainability. LEISA: Low-External-Input and Sustainable Agriculture (LEISA) is agriculture which makes optimal use of locally available natural and human resources (such as soil, water, vegetation, local plants and animals, and human labour, knowledge and skill) and which is economically feasible, ecologically sound, culturally adapted. LEISA techniques for sustainability: Non-monetary inputs 1. Proper planting time. 2. Depth of sowing. 3. Optimum plant population. 4. Inter cropping. 5. Legumes in rotation. 6. Recycling of farm wastes. 7. Crop rotation and clean cultivation. 8. Crop substitution. 9. Weed control at critical stages of weed competition. Low-cost inputs/ technologies 1. Choice of variety and good quality seed. 2. Efficient use of manures. 3. Biofertilizers. 4. Seed treatments. 5. In situ water conservation. 6. Crop sequence. 7. Water management. 8. Alley cropping. 9. Biopesticides.
Q. 4	What is farming system? Enlist objectives of farming system. Farming system represents appropriate combinations of farm enterprises viz., cropping system, livestock, poultry, fishery and the means available to the farmers to raise them for increasing profitability. They interact adequately with environment without dislocating the ecological and socio-economics balance on the one hand and attempt to meet the national goal on the other. Farming system specially refers to a group combination of enterprises in which the products and or the byproducts of one enterprise serve as the inputs for production of other enterprise. For example, Livestock rising along with crop production is the traditional mixture of activities of the farmer all over the country. The waste of dairying like dung, urine, refuse etc. is used for preparation of FYM, which is an input in cropping systems. The straw obtained from the crops is used as fodder for cattle and bullocks are used for different field operations for growing crops. Thus, different enterprises of farming systems are highly interrelated. Objectives- 1) To identify existing farming system in specific areas and assess their relative viability. 2) To formulate farming system model involving main and allied enterprises for different farming situations. 3) To insure optimal utilization and conservation of available resources and effective recycling of residues within system. 4) To maintain sustainable production system without damaging resources/environment. 5) To rise overall profitability of farmhouse holds by complementing main/allied enterprises with other enterprises.

Q. 5	Define sustainable agriculture and enlist the principles of sustainable agriculture. Sustainable Agriculture: It is a form of agriculture aimed at meeting the needs of the present generation without endangering the resource base of the future generation. Sustainable agriculture is also known as Eco farming or organic farming or natural farming. Sustainable agriculture is a balanced management system of renewable resources including soil, wildlife, forests, crops, fish, livestock, plant genetic resources and ecosystems without degradation and to provide food, livelihood for current and future generations maintaining or improving productivity and ecosystem services of these resources. Principles of sustainable agriculture 1) Living soil- maintain the soil healthy 2) No fight with nature, but co-operation with them. 3) Lessen the use of outside and distant resources. 4) Non-renewable resources must preserve and use resources efficiently i,e, sunlight, air etc. which are unlimited in nature. 5) Diversity and Adjustment- The diversity of all animals should be preserved and increased. 6) Durable livelihood- durable limitation about how much resource can be utilized by man in an area. 7) Self-dependence- The new knowledge and technology should be increase self-confidence which helps for effective planning of resources.
SECTION-B	
(Write the answers in one sentence only. Each question carries 2 marks)	
Q. 6	Do as directed.
	a) Write any two advantages of relay cropping. 1) Better utilization of residual moisture and fertilizers. 2) Reduces the cost of cultivation practices. 3) Also reduces the cost of fertilizers and irrigation. 4) Labour requirement is less. 5) Incidence of pest, diseases and weeds is less due to early sowing operation (Any two).
	b) Define cropping pattern Cropping pattern is the yearly sequence and spatial arrangement of crops or crops and fallow on a given land area (District, part of a state, a state or part of the country). It is the pattern of crops for a given piece of land or cropping pattern means the proportion of area under various crops at a point of time in a unit area. Cropping pattern refers to proportion of area under different crops.
	c) Write any two principles of conservation agriculture. 1) Continuous minimum mechanical soil disturbance.2) Permanent soil organic cover. 3) Species diversification (Any two).
	d) Write any two low-cost inputs/ technologies. Choice of variety and good quality seed, Efficient use of manures, Biofertilizers, Seed treatments, In situ water conservation, Crop sequence, Water management, Alley cropping, Biopesticides(Any two).
	e) Write any two goals of sustainable agriculture. Environmental health, Economic profitability and Social and economic equity(Any two).
	f) Write any two objectives of integrated farming system. 1) Efficient recycling of farm and animal waste. 2) Minimizing the nutrient losses 3) Adoption of efficient cropping systems & crop production4) Complementary combination of farm enterprises(Any two).

	g) Write any two non-monetary inputs. Proper planting time, Depth of sowing, Optimum plant population, Inter cropping, Legumes in rotation, Recycling of farm wastes, Crop rotation and clean cultivation, Crop substitution, Weed control at critical stages of weed competition(Any two).
SECTION-C	
(Choose the correct option. Each question carry 1 mark)	
Q. 7	1) In **Subsistence Farming** there is no sale of crop and animal products, but used for home consumption.
	2) A practice of growing only one crop in a piece of land year after year is called as**Monocropping**.
	3) **Collective Farming** includes the direct collection of plant products from non-arable lands.
	4) Benefit to cost ratio (B:C) = Gross monetary returns divided by **Cost of cultivation.**
	5) **Fertilizers** is not Low cost inputs in farming system.
	6) Growing two or more crops simultaneously on the same field per year is called as **Intercropping**.
	7) Nectar and pollen from flowers are the raw materials in **Apiculture**.
	8) Farming enterprises include **All of these.**
	9) **All of these** are non-monetary inputs.
	10) In **Specialized farming** 50% or more income of total crop production is derived from a single crop.
	11) In mixed farming **Cow and buffaloes** included with crop production.
	12) Under **Guard crops** system of cropping the main crop is grown in the centre surrounded by hardy or thorny crops.

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