MAHARASHTRA AGRICULTURAL UNIVERSITY EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION
B.Sc. (Agri.)

Semester : III (New)	**Term: I** **Academic year: 2023-24**
Course No : PATH-232	**Title : Principles of Integrated Disease Management**
Credits : 2 (1+1)	
Day & Date :	**Total Marks: 40** **Time:**

Note: 1. Solve **ANY EIGHT** questions from **SECTION 'A'**
2. All questions from **SECTION 'B'** are compulsory.
3. All questions carry equal marks.
4. Draw neat and well labelled diagrams wherever necessary.

SECTION-'A'

Model Answer Set

Q.1 **Definition:** Integration of available methods of exclusion, eradication, prevention and disease resistance without disturbing equilibrium of ecosystem. **1 Mark**

Importance with concept and advantages : Description on following points- **3 Marks**

- Low cost inputs.
- Obtaining seeds from disease free localities.
- Prevention of inputs from epidemic pockets.
- Use of low cost cultural practices.
- Least use of chemicals preferably use bio control agent like *Trichoderma* etc.

Use available disease resistant crop varieties.

Q.2 **Plant Disease:** Plant disease is defined as it is any malfunctioning of host cells and tissues that results from continuous irritation by a pathogenic agent or environmental factor and lead to development of symptoms. **1 Mark**

Economic importance of plant diseases: **3 Marks**

1) Important historical events in plant pathology.2) Ancient writings in which plant diseases are mentioned.3)Irish famine. Bengal famine.4) Changes agricultural pattern 5) Peoples depend upon agriculture for survival 6) Destroy beauty of environment by damaging plants. 7) Losses due to diseases 8) Changes food habits of human population.

Q.3 **Enlist general principles of plant disease management. Explain in short exclusion and plant quarantine.**

- **General principles of plant disease management:** **2 Marks**
- Avoidance
- Exclusion
- Eradication
- Protection
- Disease Resistance
- Therapy

A. **Exclusion:** It aims at excluding the parasites/pathogens from reaching an area hitherto free from them. **2 Marks**

B. **Plant Quarantine:**. Plant quarantine is the legal restriction on the

movements of plants and plant materials between countries and between states within the country in order to prevent entry of exotic pathogen in disease free country /state/ locality.

- Quarantine can also be classified as

1. **Domestic**: It restricts the spread of a disease with in a country, from one place to another within the state or between states.
2. **International**: The international quarantine deals with the movement of plants/ plant materials between the countries in order to ward off the risk of the infiltration of exotic pests and diseases into the countries.

Q.4 **PRA:** Pest Risk Analysis that means PRA is a form of risk analysis conducted by regulatory plant health authorities to identify the appropriate phytosanitary measures required to protect plant resources against new or emerging pests and regulated pest of plants or plant products. **1 Mark**

Different stages of PRA:

STAGE 1: Initiation- 1) Pest based information 2) Path way based information 3) Review of existing Phytosanitary policy. **1 Mark**

STAGE 2: Pest risk assessment-1) Pest categorization 2) Assessment of pest entry, establishment and spread.3) Assessment of potential consequences resulting from pest entry, establishment and spread. **1 Mark**

STAGE 3: Pest risk management- The guiding principle of this stage is to manage risk to achieve the required degree of protection that can be justified and is feasible within the limits of available resources. **1 Mark**

Q.5 **Write short notes. (Any two)**

1) Component for development of IPM module. **2 Marks**

a) Pruning and removal of pest infected plant parts b) Ploughing c) Farm yard manure use d) Sowing of trap crops e) Spraying botanicals

2) Disease forecasting. **2 Marks**

Forecasting of plant diseases involves all the activities in ascertaining and notifying the farmers in a community that conditions are sufficiently favourable for certain disease.

It requires some observed correspondence between weather and the development of a disease.

It gives advance notice to save the crop.

Prediction models have been established for late blight of potato, bacterial blight of maize, blast of paddy.

3) Tools of IPM. **2 Marks**

a) Biological control b) Mechanical control c) Chemical control d) Cultural control.

Q.6 **Plant quarantine:** Plant quarantine is defined as a legal restriction on the movement of agricultural commodities for the purpose of exclusion, prevention, or delaying the spread of the plant pest and diseases in uninfected areas. **1 Mark**

Types of plant quarantine:

Domestic quarantine: Rules and regulations issued prohibiting the movement of insect and diseases and their host from one state to another state in India. Examples of two pest and three diseases. **1 Mark**

Foreign quarantine: Rules and regulations issued prohibiting the import of plant, plant material, insect and fungi into india from foreign countries by air, sea and land with examples. **1 Mark**

Total embargoes: Total restriction on import and export of agricultural **1 Mark**

commodities.

Q.7 **Survey:** An official procedure conducted over a defined period of time to determine the characteristics of a pest population or to determine which pest species occur in an area. **1 Mark**

Surveillance: It refers to an official process which constantly collects and record data on pest occurrence or absence by survey, monitoring or other procedures. **1 Mark**

Objectives: **1 Mark**

1) To know existing and new species
2) To assess pest population and damage at different growth stage of crop.
3)To study the influence of weather parameters on pest
4)To study changing major and minor pest status

Types of survey **1 Mark**

1) Roving survey : Assessment of pest population from randomly selected spots representing large area
2) Fixed plot survey: Assessment of pest population from a fixed plot of a region.

Q.8 **Diagnosis:** Diagnosis is a form of hypothesis testing, where the hypothesis is simply identity of the disease. **1 Mark**

Different steps involved in plant disease diagnosis. **3 Marks**

a) Consider the possible agent b) Consult literature sources for possible disease and disorder c) Investigate the symptoms d) Ask questions and observe the pattern e)Review cultural practise f) Review environmental conditions g) Check host specificity h) check for symptoms and sign i)Laboratory Examination and testing j) Investigate pathogenisity k) Final diagnosis l)Develop control and recommend to grower.

Q.9 **Safety guidelines in pesticide uses:** 1. Reading Pesticide Labels. **4 Marks**
2. Understanding Pesticide Risks. 3. Minimizing Pesticide Risks
4. Minimizing Exposure at Work. 5. Reducing Disinfectant. Exposures at work. 6. Pesticide Storage. 7. Pesticide Disposal.
8. Poison Prevention. 9. Choosing and Using Insect Repellents

Q.10 **Disease Incidence:** Disease incidence is the number or proportion of plant units that are diseased in relation to the total number of the units examined. **1 Mark**

Different methods used for measurement of plant diseases. **3 Marks**

a) Disease Incidence b) Disease Severity c) Percentage scale d) Standard area diagrams e) Remote sensing.

SECTION-'B'

Q.11 Answer in one sentence.

1	*Trichoderma asperellum* or any fungal bioagent.	**1 Mark**
2	Grassy shoot of sugarcane, Loose smut of wheat.	**1 Mark**
3	Zineb, Thiram, Copper oxychloride or any non systemic fungicide.	**1 Mark**
4	Plant Growth Promoting Rhizobacteria.	**1 Mark**

Q. 12 Match the pairs

"A"		"B"	
1.	Irish Famine	d. 1845	**1 Mark**
2.	Destructive Insect and Pest Act (DIPA)	c. 1914	**1 Mark**
3.	Bengal Famine	b. 1943	**1 Mark**
4.	International Plant Protection Convention (IPPC)	a. 1997	**1 Mark**

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