



FACULTY OF APPLIED SCIENCES

Bachelor of Science in Applied Sciences

Second Year – Semester I Examination – July/ August 2023

BOT 2204 – PLANT PATHOLOGY

Index No.....

Time: Two (02) hours

PART A - Multiple choice questions.

Please read each question carefully and then underline the most suitable response.

1. Diseases caused by abiotic causes **do not** include
 - A. Root lesion caused by *Pratylenchus* spp.
 - B. freezing injury in cucumber.
 - C. leaf scorch caused by drought or high winds.
 - D. death of plants due to increased salinity.
2. Which of the following **is not** a mechanism through which pathogen cause diseases in plants?
 - A. Shade out photosynthesizing tissue
 - B. Grow and block phloem or xylem
 - C. Secrete plant growth regulators
 - D. Producing primary metabolites
3. Disease progressive curves **cannot be** used to
 - A. compare effect of environment on disease development.
 - B. compare control measures.
 - C. predict the distance of how far the disease has extended.
 - D. predict future disease development.
4. The conventional wisdom regarding pathogen-host relationship states that
 - A. pathogens always need their hosts to complete its life cycle.
 - B. a fully-evolved pathogen/parasite would not harm the host it needs for its survival.
 - C. plant host develops defensive responses when a pathogen tries to penetrate and infect it.
 - D. symptoms are shown by plants when they are under attack by a pathogen.
5. Which of the following is the best characteristic to identify a fungal plant pathogen?
 - A. The color/ morphology of mycelium
 - B. The reproductive structures.
 - C. Ooze coming out of infected area
 - D. Symptoms shown by the host plant

6. The disease caused by soil bacterium, *Agrobacterium tumefaciens* in apple is

- A. soft rot. B. crown gall. C. scab. D. leaf curl disease.

7. A good biological control agent may

- A. attack and injure plants. B. attack or repel plant pathogens.
C. attack the farmers tending the crops. D. not attack beneficial microorganisms in soil.

8. Plant Quarantine means

- A. keeping the plants obtained from other countries safe from pathogens.
B. keeping the plants obtained from other countries healthy.
C. prevention of entry of a pathogen, pest or weed to a country.
D. prevention of exit of plants or plant parts out of the country.

9. An example of a systemic symptoms is

- A. galls. B. leaf spots. C. fruit rots. D. stunted growth.

10. Which of the following statements about Incubation period of a plant disease **is incorrect**?

- A. Incubation period is the time period between infection and the appearance of first symptom.
B. The length of the incubation period may range from days to months.
C. Incubation period depends on the pathogen and host plant involved.
D. The crop is mostly harmed during the incubation period.

11. Which of the following statements about defense mechanisms shown during a plant-pathogen interaction **is incorrect**?

- A. Elicitors are components of pathogens that can be recognized by host.
B. A Specific defense mechanism is always initiated when a pathogen comes in contact with the host.
C. Some pathogens can be insensitive to the plants defense reactions.
D. Defense responses can be triggered in the locally attacked tissues as well as in healthy tissues as a systemic response.

12. Which of the following **is not** a method through which a bacterial pathogen enters the host?

- A. Through stomata B. Through a wound C. By producing an appressorium D. Through hydathodes

13. Which of the following terms defines the number of new cases of a disease in the population at a given time?

- A. Disease incidence B. Disease prevalence C. Disease severity E. Disease triangle

14. Which of the following is a common symptom of virus diseases in plants?

- A. Lack of chlorophyll formation in normally green organs B. Oozing
C. Wilting. D. Formation of galls

15. Which of the following **is not** a pathogen exclusion strategy of plant disease management?

- A. Eliminate the inoculum B. Reduce initial inoculum.
C. Delay the introduction of inoculum D. Shorten exposure to favorable conditions

16. Horizontal resistance

- A. is not under genetic control.
B. is the resistance against all races of the pathogen.
C. reduces the initial inoculum.
D. can be easily introduced to a crop variety through breeding.

17. Crop rotation is

- A. useful against soil and air borne diseases.
B. a good control method for the pathogens which are not host-specific but highly mobile.
C. useful as residues of some plants may be toxic to some pathogens.
D. planting crops in the same family in a rotating manner.

PART B – Structured Essay Questions.

Answer all the questions in the space provided.

2. a) "A plant disease is any abnormal condition that alters the appearance or function of a plant".

i. Name **five (05)** causative agents that causes diseases in plants.

(10 marks)

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ii. Give **one (01)** example for the disease caused by any **three (03)** of the above-mentioned causative agents. **(15 marks)**

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iii. Name **five (05)** disease management methods that can be used to control/ manage plant diseases. **(10 marks)**

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iv. Name **three (03)** disease management components which are used to develop an integrated disease management (IDM) method. **(15 marks)**

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b) When a pathogen tries to cause infectious disease to a plant, the plant develops defense mechanisms against the pathogen.

i. Plants have developed natural adaptations as a defense mechanism. State **two (02)** such methods by which plants defends itself against pathogens. **(10 marks)**

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ii. What is hypersensitive reaction in plant pathology? **(08 marks)**

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- lii. The gene-for-gene hypothesis states that for each gene controlling resistance in the host, there is a corresponding, specific gene controlling avirulence in the pathogen.

R genes encoded in the host (**Resistance- R, susceptible - r**) is corresponding to **avr genes** encoded in the respective pathogen (**A – Avirulence, a-Virulence**). The following table shows the possible interaction of the pathogen with its possible host. Indicate whether the disease is caused or not in such instances by (+) or (-) in respective cages, where (+) denotes cause of disease and (-) denotes do not cause disease.

	R gene of the host	
Avr gene of Pathogen	R	r
A		
a		

(32 marks)

PART C – Essay Questions.

Answer two (02) questions only.

3. An Epidemic is known as "The change in disease intensity in a host population over time and space ".
Give a brief account on the factors that affect development of an epidemic. (100 marks)

4. Describe briefly how a fungal pathogen penetrates a host and causes infections assuming it has a monocyclic disease cycle. (100 marks)

5. Write short notes on the following: (100 marks)
 - a) Movement of pathogens from cell to cell in a host plant.
 - b) Classification of plant diseases based on the natural perpetuation (spread) of pathogens.
 - c) Plant viral diseases

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