

Khulna University

School: Life Science **Discipline:** Agrotechnology **Program:** MS in Plant Pathology

Year: 1st **Term:** 1st **Examination Year:** 2026 **Session:** 2025-2026

0811 08 PLP 5101: Seed Pathology

Full Marks: 60 **Time:** 03 Hours **Credit:** 03



- There are four questions in each section, answer any three from each.
- Use separate sheet for each section. Sketch and label wherever necessary.

Section A

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| 1. | (a) Discuss the importance of storage fungi. [L2; CLO1] | 3.0 |
| | (b) Discuss the effect of fungi on seed discoloration and the elimination of seed germination capacity. [L2, L6; CLO1] | 3.0 |
| | (c) Identify the role of temperature in relation to the damage of seed in storage. [L3; CLO1] | 4.0 |
| 2. | (a) Outline and describe the key steps involved in the proper management of seeds during storage. [L4; CLO1] | 4.0 |
| | (b) Discuss how the interaction between moisture and temperature influences the establishment and development of seed-borne diseases. [L3; CLO2] | 6.0 |
| 3. | (a) Explain how physiological factors in the host influence the establishment and development of disease, with a suitable example. [L5; CLO2] | 6.0 |
| | (b) Enlist and explain the essential precautions to be followed for avoiding storage fungal diseases. [L4; CLO1] | 4.0 |
| 4. | (a) Describe the effects of soil moisture and soil pH (soil reaction) on seed-borne pathogens, citing examples. [L2; CLO2] | 4.0 |
| | (b) "Inoculum potential of the pathogen is one of the determining factors of disease development" - justify with examples. [L5; CLO2] | 4.0 |
| | (c) Why is seed transmission of viruses relatively infrequent? [L2; CLO2] | 2.0 |

Section B

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| 5. | (a) Discuss the general guidelines for seed treatment. [L2, L3; CLO3] | 3.0 |
| | (b) What are systemic and contact seed treatments? How do they differ in their action? [L1; CLO3] | 3.0 |
| | (c) Explain how a working sample is prepared from a primary sample, with a real-time example. [L3; CLO3] | 4.0 |
| 6. | (a) What precautions should be taken while handling and applying chemical seed treatments? [L1; CLO3] | 3.0 |
| | (b) Analyze the common seed health testing methods based on their procedures, advantages, and disadvantages. [L4; CLO4] | 4.0 |
| | (c) How can seed health testing contribute to producing disease-free seeds? [L3; CLO4] | 3.0 |
| 7. | (a) "Chemical treated seed prevents seedling infection by pathogens" - explain. [L3, CLO3] | 3.0 |
| | (b) Justify why chemical methods of seed treatment are superior to other methods. [L5; CLO3] | 4.0 |
| | (c) How do incubation conditions affect the detection of pathogens in seed health testing? [L3; CLO4] | 3.0 |
| 8. | (a) Discuss the role of seed quarantine in preventing the introduction and spread of exotic seed-borne pathogens. What are the key regulations and international standards involved? [L4; CLO4] | 4.0 |
| | (b) Explain the plant quarantine system in Bangladesh. [L2; CLO4] | 4.0 |
| | (c) Discuss the role of plant quarantine in controlling seed-borne diseases. [L3; CLO4] | 2.0 |

[L1-Remember, L2-Understand, L3-Apply, L4-Analyze, L5-Evaluate, L6-Create]

Khulna University

School: Life Science Discipline: Agrotechnology Program: MS in Plant Pathology

Year: 1st Term: 1st Examination Year: 2026 Session: 2025-2026

0811 08 PLP 5103: Methods in Plant Pathology

Full Marks: 60 Time: 03 Hours Credit: 02



- There are four questions in each section, answer any three from each.
- Use separate sheet for each section. Sketch and label wherever necessary.

Section A

- What precautions should be taken while collecting diseased samples? [L2; CLO1] 2.0
 - Construct a labelled diagram showing the step-by-step procedure of specimen collection and preservation. [L5; CLO1] 5.0
 - Explain why maintaining pure cultures of plant pathogens is essential for research and accurate disease diagnosis. [L4; CLO1] 3.0
- Explain the importance of pathogenicity tests in plant disease diagnosis. [L2; CLO1] 2.0
 - Analyze contamination risks in local laboratory conditions and suggest causes. [L4; CLO1] 3.0
 - A rice field in Bangladesh shows blast symptoms. Describe how you would isolate, multiply, and confirm the pathogen. [L5; CLO1] 5.0
- Critically analyze how incorrect soil pH can affect both the growth and accurate identification of plant pathogens. [L4; CLO2] 3.0
 - Analyze the advantages and limitations of spectrophotometry in pathogen estimation. [L4; CLO2] 4.0
 - Explain the various types of chromatography used in plant pathology and discuss their roles in detecting plant toxins. [L5; CLO2] 3.0
- Why is pH important in culture media preparation for pathogen isolation? Criticize with an example. [L4; CLO2] 4.0
 - Discuss the use of spectrophotometry in quantifying pathogen concentrations and microbial metabolites. [L5; CLO2] 4.0
 - Enumerate the properties and components of a spectrophotometer. [L3; CLO2] 2.0

Section B

- What are the characteristics of an effective technical report in plant pathology? [L2; CLO4] 2.0
 - Describe the steps involved in preparing a technical report on crop loss assessment due to plant disease. [L5; CLO4] 5.0
 - What points should be considered for writing an abstract of a scientific paper? [L5; CLO5] 3.0
- Enlist the basic criteria of a good fungicide. [L2; CLO3] 4.0
 - Define systemic and contact antipathogenic chemicals. How do they differ? [L2; CLO4] 3.0
 - What are antipathogenic chemicals? Give two examples with their target pathogens. [L2; CLO3] 3.0
- Critically assess the advantages and limitations of using chemical control versus host plant resistance in managing plant diseases. [L5; CLO3] 4.0
 - Suppose you have 20 wheat lines from abroad. You want to screen them for resistance to *Bipolaris sorokiniana*. Construct a research protocol for the study. [L6; CLO3] 4.0
 - What are the challenges in developing disease-resistant crop varieties in our country? Justify the answer. [L4; CLO3] 2.0
- Explain why yield loss due to a specific disease of a crop is important. [L4; CLO4] 3.0
 - Develop a working protocol for estimating yield loss due to the cercospora leaf spot of blackgram in a field of Khulna University campus. [L6; CLO4] 4.0
 - How can disease severity scales be used to estimate yield loss? [L3; CLO4] 3.0

[L1-Remember, L2-Understand, L3-Apply, L4-Analyze, L5-Evaluate, L6-Create]

Khulna University

School: Life Science **Discipline:** Agrotechnology **Program:** MS in Plant Pathology

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0811 08 PLP 5105: Plant Pathogenesis

Full Marks: 60 **Time:** 03 Hours **Credit:** 03



- There are four questions in each section, answer any three from each.
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Section A

- Analyze the role of virulence factors in determining pathogenicity. [L3; CLO1] 3.0
 - Discuss how environmental conditions modify pathogenicity and disease severity. [L4; CLO1] 4.0
 - Compare and contrast obligate parasites and facultative parasites with suitable examples. [L3; CLO1] 3.0
- List the stages involved in the infection process of a plant pathogen. [L2; CLO1] 2.0
 - Examine the relationship between colonization and symptom development in infected plants. [L4; CLO1] 4.0
 - Evaluate how different stages of infection contribute to disease severity and spread. [L4; CLO1] 4.0
- List different types of enzymes involved in plant pathogenesis. [L1; CLO2] 2.0
 - Describe different types of toxins produced by plant pathogens and their effects on host tissues. [L4; CLO2] 4.0
 - Examine how toxins interfere with normal physiological processes in plants. [L4; CLO2] 4.0
- Evaluate how the fluctuation of day-night temperature affects epidemic development. [L5; CLO4] 4.0
 - Show how host plant nutrition critically affects disease development. [L2; CLO4] 3.0
 - How do air pollution, herbicides, and light affect disease development? [L5; CLO4] 3.0

Section B

- Evaluate the permeability changes in diseased plants. [L5; CLO5] 5.0
 - Demonstrate the change in respiration in a diseased plant. [L4; CLO5] 5.0
- Conclude how vascular transport affects wilt diseases in plants. [L5; CLO5] 5.0
 - Determine the effect of pathogens on photosynthesis. [L5; CLO5] 5.0
- Define phytoalexins and state their role in plant defense. [L2; CLO5] 2.0
 - Explain the role of biochemical defenses such as phenolic compounds, enzyme inhibitors, and phytoalexins in plant immunity. [L5; CLO5] 5.0
 - How do plants defend themselves by inactivating pathogen-produced enzymes and toxins? Illustrate with examples. [L3; CLO5] 3.0
- "Secondary metabolites of various types have a massive role in defense mechanisms of plants"—explain. [L5; CLO6] 6.0
 - A researcher observes cell wall thickening around the infection site in a fungal disease. Identify the type of defense involved and explain its function critically. [L5; CLO5] 4.0

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