

Khulna University

School: Life Science Discipline: Agrotechnology Program: Bachelor (Hons)

Year: 2nd Term: 1st Examination Year: 2026 Session: 2025-2026

081108 AT 2101: Fundamentals of Plant 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

- 1a. What is the importance of studying plant pathology in agriculture? [L2; CLO1] 2
- b. Distinguish between biotic and abiotic causes of plant diseases. Provide two examples for each category. [L2; CLO1] 2
- c. What was the significance of the Bengal Famine of 1943 in the context of plant pathology? [L2; CLO1] 3
- d. Discuss the significance of plant diseases in agriculture and food security with special reference to Bangladesh. [L3; CLO1] 3
- 2a. Discuss the structure, formation, and functions of fungal modifications such as haustorium, sclerotia, rhizomorphs, and stromata. [L3; CLO2] 3
- b. Analyze, with suitable diagrams, the different types of sexual fruiting bodies in Ascomycotina. [L4; CLO2] 4
- c. Differentiate among oospores, zygospores, ascospores, and basidiospores with examples. [L3; CLO2] 3
- 3a. Name the different types of asexual spores produced by fungi. [L2; CLO1] 2
- b. Explain the harmful effects of *Aspergillus* species and discuss the economic significance of *Penicillium* species in agriculture. [L3; CLO2] 3
- c. Define macrocyclic rust and describe the different spore stages of rust fungi with appropriate diagrams. [L3; CLO2] 3
- d. Analyze the relationship between environmental temperature and the reproductive cycle of fungal pathogens. [L4; CLO2] 2
- 4a. What are teliospore? Name the class to which it belongs to. Draw a germinating teliospore of *Puccinia*. [L3; CLO2] 3
- b. Draw, label, and describe the life cycle of *Saccharomyces cerevisiae*. [L3; CLO2] 3
- c. Why are fungi considered heterotrophic? Draw and describe the different types of zoospores with their characteristics. [L3; CLO2] 4

Section B

- 5a. Describe the structure of a typical bacterial cell with labeled diagram. [L3; CLO2] 4
- b. Classify bacteria based on flagellar arrangement with examples. [L3; CLO2] 3
- c. Explain the major symptoms caused by plant pathogenic bacteria. [L4; CLO2] 3
- 6a. Define plant parasitic nematodes. Describe their feeding mechanism. [L2; CLO2] 3
- b. Discuss the important symptoms of nematode infestation in crop plants. [L4; CLO2] 4

c. Explain integrated nematode management practices. [L5; CLO2]	3
7a. 'Insect vector plays an important role in the transmission of viral diseases' - explain. [L2; CLO2]	3
b. Analyze how you can control viral diseases in plants. [L4; CLO2]	4
c. Describe the below-ground symptoms of nematode disease in plant. [L2; CLO2]	3
8a. Classify parasitic phanerogams with suitable examples. [L4; CLO3]	4
b. Describe the morphology, parasitism, and control measures of <i>Cuscuta</i> spp. [L4; CLO3]	4
c. Write short notes on <i>Orobancha</i> as a plant pathogen. [L2; CLO3]	2

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081108 AT 2103: Plant Physiology

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

- 1a. What is ascent of sap? 'Apoplastic pathway of water movement in root turns into symplastic pathway'- justify the statement with examples. [L1,5; CLO1] 4
- b. Compose the Donnan equilibrium theory of mineral salt absorption mechanism in plants. [L2; CLO1] 3
- c. Differentiate between transpiration and guttation with examples. [L4; CLO1] 3
- 2a. Briefly state the mechanism of stomatal transpiration in crop plants. [L2; CLO2] 4
- b. Draw and label non-cyclic photophosphorylation of light reaction in plants. [L3; CLO2] 3
- c. What is the source-sink relationship? How does it regulate dry matter production and distribution in plants? [L1,2; CLO1] 3
- 3a. How do C₄ plants adapt under adverse environmental conditions? [L2; CLO1] 3
- b. Distinguish between cyclic and non-cyclic photophosphorylation. [L4; CLO1] 3
- c. Give an outline of assimilates' partitioning in higher plants. [L2; CLO3] 4
- 4a. State the mechanism of translocation process in plants. [L2; CLO1] 3
- b. Distinguish between oxidative phosphorylation and photo-phosphorylation with examples. [L4; CLO1] 3
- c. Represent diagrammatically TCA cycle in plants with significance. [L2; CLO2] 4

Section B

- 5a. Define plant growth. What type of changes occur due to growth? Show it with example. [L1; CLO2] 3
- b. Name different growth phases. Explain arithmetic growth rate. [L1,2; CLO2] 3
- c. Explain relative growth rate (RGR). [L2; CLO2] 2
- d. Mention 2 examples from each of growth promoting and growth inhibiting hormones with their 2 key usage in agriculture. [L1; CLO2] 2
- 6a. Summarize the phytochrome-mediated flowering mechanisms in crop plants. [L4; CLO4] 2
- b. Annotate what is critical day length and compare between short-day plants and long-day plants with examples. [L2,5; CLO2] 3
- c. Explain night break phenomenon. [L2; CLO2] 3
- d. Contrast between facultative and obligate photoperiodic plants with examples. [L4; CLO1] 2
- 7a. What are antitranspirants? Outline its role in improving water use efficiency. [L1, L3; CLO4] 2

- b. What is physiological dormancy of seed, how is it different from physical dormancy? [L1,4; CLO3] 3
- c. Briefly explain the role of abscisic acid (ABA) and gibberellic acid (GA) in seed dormancy. [L2; CLO3] 3
- d. List down the chemical changes occur during seed tetrazolium test. [L2; CLO3] 2
- 8a. Outline drought avoidance and drought escape with examples. Chronologically organize the morphological response of plants to drought. [L2,6; CLO4] 2
- b. Delineate the consequences of water logging in plants. [L2; CLO4] 2
- c. How does salinity affect photosynthesis in plants? [L2; CLO4] 3
- d. Briefly analyze the avoidance cascades the plants generally adopt against salt stress with an example. 3

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081108 AT 2105: Agrometeorology and Environmental Impact

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

- 1a. Outline meteorology. Discuss the significance of meteorology in the field of agriculture at five specific points. [L2; CLO1] 4
- b. Compose a short note about BMD. Mention different types of observatories of BMD. [L2; CLO1] 3
- c. Compare among Assmann psychrometer, Pyrgometer and Eppley Spectral pyranometer in terms of usage. [L5; CLO1] 3
- 2a. Describe the major cloud types and mention the cloud type formed by their combination with height of appearance. [L2; CLO2] 4
- b. 'Climate varies on opposite sides of a mountain' – justify with example. [L5; CLO5] 3
- c. What is a thunderstorm? Narrate the stages of thunderstorm development. [L2; CLO2] 3
- 3a. 'All rainfall is precipitation and all precipitation may not be rainfall' - justify. Classify rainfall and drizzle based on the intensity [L5,3; CLO2] 4
- b. What is tide? Contrast among different types of tides with key features and their neat label sketch. [L1,3; CLO2] 3
- c. Calculate the specific humidity, absolute humidity and relative humidity from the data given below: 3
 - i. Volume of the air = 3 m³
 - ii. Weight of the air including water vapor = 24 g
 - iii. Weight of the water vapor = 25 g
 - iv. Water vapor required for saturation of the air = 25 g [L3; CLO2]
- 4a. Annotate the terms: i) radiative index of dryness, ii) cardinal temperature and iii) lapse-rate. [L2; CLO2] 4
- b. How are heat and temperature linked? [L2; CLO2] 3
- c. How does a cyclone differ from a tornado? [L3; CLO2] 3

Section B

- 5a. Classify weather forecast based on the time range. [L3; CLO5] 2
- b. 'CAM plants are better adapted to stress environments' — justify this statement with examples. [L5; CLO5] 4
- c. 'Production planning of a crop depends on the proper utilization of agrometeorological data'— judge with example. [L5; CLO5] 4
- 6a. Define photosynthetically active radiation. [L1; CLO2] 2
- b. How is the radiation balance of earth surface maintained? Schematically represent the radiation 4

- balance at earth surface. [L2; CLO2]
- c. 'Energy emission is more in blue light than that of red light' - prove mathematically. [L6; CLO2] 4
- 7a. What are antitranspirants? Outline its role in improving water use efficiency. [L1, L3; CLO4] 3
- b. 'The modern agricultural practices enhance the emission of greenhouse gases' - justify with example. [L5; CLO2] 4
- c. 'Predictability of weather forecasting depends on systematic study of weather parameters'- assess. [L5; CLO5] 3
- 8a. Discuss the light-dependent and light-independent reactions of photosynthesis and their interdependence. [L2; CLO3] 4
- b. Analyze how meteorological data are applied in sowing time, irrigation scheduling and fertilizer management. [L4; CLO5] 3
- c. Construct a relation between photosynthesis and water use efficiency. [L6; CLO3] 3

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081108 AT 2107: Ornamental Horticulture

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

- 1a. Define ornamental horticulture. How is ornamental horticulture linked with other disciplines of science? [L2; CLO1] 3
- b. Assess the importance of growing ornamental plants in Bangladesh. [L5; CLO1] 4
- c. 'Bangladesh has a tremendous scope of exporting horticulture commodities' - justify. [L5; CLO1] 3
- 2a. Classify ornamental plants based on ecological distribution. [L3; CLO1] 2
- b. Analyze the watering and feeding of bedding annuals. [L4; CLO2] 3
- c. Describe the cultivation procedure of cock's comb. [L2; CLO2] 5
- 3a. Differentiate between the propagating materials of gladiolus and tuberose. [L4; CLO2] 2
- b. Outline the cultivation procedure of marigolds. [L2; CLO2] 4
- c. Name the parents of roses. Delineate the harvesting and post-harvesting handling of roses. [L2; CLO2] 4
- 4a. Discuss the harvesting techniques of chrysanthemum. [L2; CLO2] 3
- b. What are the salient features of cacti? Which management practice is the most important for cactus and why? [L2; CLO2] 3
- c. Why is the orchid so popular worldwide? Draw and label an orchid flower. [L2; CLO2] 4

Section B

- 5a. Define landscape horticulture. Assess the importance of landscape gardening in Bangladesh. [L1,5; CLO3] 4
- b. Explain the basic principles of landscape design. [L2; CLO3] 3
- c. Classify shrubs based on uses and tolerance to sun light. [L3; CLO3] 3
- 6a. Enlist the various types of hedge plants. [L1; CLO4] 3
- b. How can an informal water garden be established? [L2; CLO4] 4
- c. Discuss the salient features of a Japanese garden. [L2; CLO4] 3
- 7a. What is Ikebana? Enlist the methods of Ikebana. [L1; CLO5] 4
- b. How to develop a turf? Describe the maintenance of a turf. [L2; CLO4] 3
- c. 'Bangladesh should go for more roof gardening' - justify. [L5; CLO4] 3
- 8a. What is a flower arrangement? Explain how a flower arrangement can express the culture of a nation with an example. [L2; CLO4] 4

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| b. What is bonsai? Classify bonsai with their labeled diagrams. [L1,3; CLO5] | 3 |
| c. Explain the maintenance procedure of bonsai. [L2; CLO5] | 3 |

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031108 Econ 2155: Agricultural Economics

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

- 1a. Define agricultural economics? [L1; CLO1] 2
- b. Analyze how agricultural economics contributes to rural development. [L4; CLO1] 4
- c. 'Technology without economic analysis may not benefit farmers' – discuss [L2; CLO1] 4
- 2a. Explain the law of demand and state its exceptions. How can you derive a market demand curve? [L3; CLO2] 6
- b. 'All goods do not follow the law of demand' - justify this statement. [L5; CLO2] 4
- 3a. Explain the concept of GDP and GNP with suitable examples. [L2; CLO1] 2
- b. How can national income statistics be used for economic planning? [L2; CLO1] 3
- c. Analyze the three methods of measuring national income with real-life examples. [L5; CLO1] 5
- 4a. 'Efficient use of land is essential for sustainable agricultural development' – judge with example. [L6; CLO2] 6
- b. Explain the circular flow of income in a three-sector economy. [L2; CLO6] 4

Section B

- 5a. Discuss the significance of agricultural finance in achieving food security and accelerating agricultural development in Bangladesh. [L2; CLO5] 6
- b. Critically examine the causes and consequences of rural poverty. [L5; CLO4] 4
- 6a. 'Agriculture plays a diminishing but still vital role in the economy of Bangladesh' - justify. [L5; CLO5] 5
- b. Analyze the role of modern agriculture in ensuring food security. [L4; CLO5] 5
- 7a. Why is a farm considered a basic unit of agricultural production? [L1; CLO4] 2
- b. Explain the role of subsistence farming in rural livelihoods. [L2; CLO4] 3
- c. Evaluate the impact of specialised farming on rural development in Bangladesh. [L5; CLO4] 5
- 8a. What is a Land Tenure System? [L1; CLO4] 2
- b. Why is land tenure important in agriculture? [L2; CLO4] 3
- c. Critically judge the major land reform measures with their objectives. [L5; CLO4] 5