

AT



Khulna University

Khulna, Bangladesh

Agrotechnology Discipline

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

Course Code: 0811 08 AT 1101, Course Title: Fundamentals of Agronomy

Total Marks: 60, Time: 3.0 Hours, Credit: 03

- Each section has four questions; Answer any three questions from each.
- Figures in the margin indicate full marks. Questions are of equal value.
- Use a separate sheet for each section.

Section A

Question no.	Question Description	Marks	*Level (L1-L6)	CLO No.
1.a	Differentiate between agriculture and agronomy.	3.0	2	2
1.b	Explain the significant developments in the agricultural sector of Bangladesh.	3.0	2	2
1.c	List six important agricultural research institutes in Bangladesh with their locations. Among them which institutes do research on single crop?	2.0+1.0	1	2
1.d	Explain the lethal limits of temperature	1.0	2	1,3
2.a	Compare and contrast between weather and climate.	3.0	2	1
2.b	“Temperature is an important influencing factor for crop growth and development” explore.	4.0	2	1
2.c	Evaluate the importance of rainfall for successful crop cultivation.	3.0	5	1
3.a	Define crop. Classify crops based on their ontogeny with examples.	1+3	1,2	2
3.b	Enlist four important land topographic units of Bangladesh and crops grown therein.	2.0	1	2
3.c	Name the rice growing seasons of Bangladesh mentioning their duration. Give examples.	2.0	1	2
3.d	Define agroecological zone. Why the study of AEZ is important?	1+1	1,1	2
4.a	List the anionic forms of nutrients absorbed by plants. Write the functions of N and S in plants.	4.0	1	3
4.b	Classify the nutrients based on the mobility in the soil.	2.0	2	3
4.c.	Mention the changes in the plant due to deficiency of N and K.	4.0	2	3

Section B

5.a	Differentiate conventional tillage from minimum tillage.	3.0	4	3
5.b	Classify tillage with their brief description and implements used in each tillage type.	3.0	4	3
5.c	How is a plough pan created? What are the effects of a plough pan in crop cultivation? How can you break down the plough pan?	4.0	4	4
6.a	'Deep placement of urea is advantageous over surface application.' Justify.	2.0	5	3
6.b	Write a short note on preparation of green manuring.	2.0	1	3
6.c	Name the commonly used fertilizer in Bangladesh with their chemical formulae and percent of nutrient present in them.	4.0	1,2	3
6.d	"Continuous use of urea fertilizer makes the soil acidic" Explain	2.0	1,1	3
7.a	Mention the name of sowing method with crop example. What are the disadvantages of broadcasting method.	2.0	2	5
b.	What is transplanting? "All plants are not suitable for transplanting" do you agree with the statement? Support your answer.	4.0	4	5
c.	Enumerate the criteria for selecting a site for nursery bed.	3.0	,2	5
8.a	Define intercultural operation? What intercultural operation is needed for broadcasting crop?	3	2,1	5
8.b	Explain the terms: i) thinning, and ii) weeding	1x2=2	2	5
8.c	Differentiate between irrigation and drainage. What are the commonly practiced irrigation and drainage system in Bangladesh?	3	5	3
8.d	Name the water saving irrigation systems. Write their disadvantages.	2	5	2



Khulna University

Khulna, Bangladesh

Agrotechnology Discipline

1st Year, 1st Term, Examination Year: 2026, Session: 2025-2026
Course Code: 0811 08 AT 1103, Course Title: Introductory Soil Science
Total Marks: 60, Time: 3.0 Hours, Credit: 03

- Each section has four questions; Answer any three questions from each.
- Figures in the margin indicate full marks. Questions are of equal value.
- Use a separate sheet for each section.

Section A

Question no.	Question Description	Marks	*Level (L1-L6)	CLO No.
1.a	Define soil profile. Illustrate a typical soil profile with all of its horizons.	4.5	2	2
1.b	What is meant by soil water?	3.0	2	2
1.c	Why is organic matter important for crop production?	2.5	1	2
2.a	Define rocks and minerals. Classify rocks based on origin and formation.	4.0	2	1
2.b	Describe the physical and chemical process of weathering involved in soil formation.	3.0	2	1
2.c	Write down the impacts of water, ice, air and organism on the mechanical weathering process.	3.0	5	1
3.a	What is meant by soil forming factors?	3.0	1,2	2
3.b	Describe the origin, characteristics and distribution of Madhupur clay in Bangladesh	3.0	2	3
3.c	Define mechanical analysis of soil and mention the principles of it. Write down its importance in agriculture.	4.0	1	2
4.a	State Stoke's law. Discuss its assumptions in soil particle analysis.	3.0	1,3	1
4.b	Mention the characteristics of sand particle and clay particles of soil.	2.0	1	1
4.c	Distinguish between soil texture and soil structure. Briefly describe different types of soil structures.	5.0	1	1

Section B

5.a	Define soil fertility and soil productivity. "A fertile soil may not be productive" explain	3.5	1	3
5.b	Classify essential plant nutrients. Write down the criteria for essentiality of nutrients for plants.	3.5	1	3
5.c	Mention the deficiency symptoms of N, P and K in crop plants.	3.0	2	1
6.a	What is manure? "Manures improve the soil health" justify the statement.	3.0	4	3
6.b	Write a short note on process of preparing compost.	3.0	3	3
6.c	Name the commonly used fertilizer in Bangladesh with their chemical formula and percent of nutrient present in them.	4.0	1,2	3
7.a	Classify soil according to pH. How can you reclaim an acidic soil?	3.0	2	5
b.	How does pH affects the availability of phosphorus ions in soil?	2.0	4	5
c.	Define soil organism. Show a brief accounts of classification of soil organisms.	3.0	4	2
d.	Mention the functions of soil bacteria.	2.0	4	2
8.a	Differentiate between procaryotes and eucaryotes with suitable examples.	3.0	2,1	5
8.b	Describe the occurrence and functions of fungi, algae in soil for crop production.	4.0	2	5
8.c	Define biofertilizer and discuss its concept and importance in sustainable agriculture.	3.0	5	3



Khulna University

School: Life Science

Discipline: Agrotechnology

Program: Bachelor

Year: 1st

Term: I

Examination Year: 2026

Session: 2025-26

Course Code: 081108 AT-1105

Course Title: Agricultural Botany

Total Marks: 60

Time: 03 hours

Credit: 03

Instructions (if any):

Comments/Remarks (if any):

Section B

There are 04 questions in this section. Answer any 03 questions.

Question No.	Question Description	Marks	*Level (L1-L6)	CLO No.
6. a)	Briefly describe the fluid mosaic model of plasma membrane with figure.	4.0	L2	3
6. b)	Nucleus is not considered as a cell organelle- why?	2.0	L2	3
6. c)	Classify meristems based on functions.	2.0	L2	3
6. d)	Differentiate between meristematic tissue and permanent tissue.	2.0	L1	3
7. a)	Enumerate the cellular characteristics and functions of parenchyma tissue in plants.	4.0	L2	3
7. b)	Draw and label different types of vascular bundles in plants.	3.0	L2	3
7. c)	Detect the differences between monocotyledon and dicotyledon roots in terms of pericycle, xylem and pith.	3.0	L3	3
8. a)	What is pollen tetrad? Explain the process of syngamy.	2.0+2.0	L1	4
8. b)	Describe megagametogenesis in angiosperms with suitable illustration.	4.0	L2	4
8. c)	Endosperm development is a post fertilization event- explain.	2.0	L2	4

*Levels of Bloom's cognitive domain:

[L1=Remember; L2=Understand; L3=Apply; L4=Analyze; L5=Evaluate; L6=Create]

**Khulna University****School: Life Science****Discipline: Agrotechnology****Program: Bachelor****Year: 1st****Term: I****Examination Year: 2026****Session: 2025-26****Course Code: 081108 AT-1105****Course Title: Agricultural Botany****Total Marks: 60****Time: 03 hours****Credit: 03****Instructions (if any):****Comments/Remarks (if any):****Section A**

There are 04 questions in this section. Answer any 03 questions.

Question No.	Question Description	Marks	*Level (L1-L6)	CLO No.
1. a)	Write down the components of plant taxonomy and define them.	3.0	L1	1
1. b)	Show the schematic representation of plant classification given by Bentham and Hooker. [L2; CLO1].	3.0	L2	1
1. c)	What is binomial nomenclature? Enumerate the taxa and endings used for plant classification with examples.	4.0	L2	1
2. a)	Define flower. Classify flower based on symmetry and ovary position.	4.0	L2	2
2. b)	Categorize stem modifications with examples.	4.0	L3	2
2. c)	Explain the functions of leaf.	2.0	L2	2
3. a)	Define panicle, spadix, umbel and leaf tendril.	4.0	L2	1
3. b)	Embryo is called miniature form of plants- why?	2.0	L5	3
3. c)	Point out distinguishing characteristics of Poaceae family with economic importances.	4.0	L3	2
4. a)	What is placentation? Outline different types of placentation in plants.	4.0	L4	3
4. b)	Enlist four botanical name of legume crop. Assess the economic importance of Fabaceae family in agriculture.	4.0	L2	3
4. c)	Enumerate the identifying characteristics of Cucurbitaceae family.	2.0	L3	2

Section B

5. a)	Clarify cell theory.	2.0	L2	3
5. b)	Draw and label a typical plant cell.	4.0	L3	3
5. c)	Compare and contrast between rough ER and smooth ER with proper diagram.	4.0	L4	3

*Levels of Bloom's cognitive domain:

[L1=Remember; L2=Understand; L3=Apply; L4=Analyze; L5=Evaluate; L6=Create]

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Agrotechnology Discipline
Khulna University, Khulna
BSc (Honors) in Agrotechnology
First Year, First Term Session: 2025-2026
Course No.: 0314 08 SOC 1155 Course Title: Sociology

Time: 03 Hours

Full Marks: 60

▪ The figures in the right margin indicate full marks. The questions are of equal value.

Section A

There are **four** questions in this section. Answer any **three** questions.

	Marks	*Level (L1-L6)	CLO No.
1. (a) What is Sociology and what does it study in society?	03	L2	1
(b) Critically analyze the major theoretical perspectives of Sociology.	03	L4	1
(c) How an undergraduate student of Agriculture can contribute sociologically to the agricultural sector of Bangladesh?	04	L3	1
2. (a) What are social norms in society?	03	L1	2
(b) Describe the following sociological terms with suitable examples: i) Society; ii) Community; iii) Association	03	L4	2
(c) Evaluate the role of social institutions and groups in the process of socialization. Discuss how these contribute to social cohesion or conflict?	2+2	L4	1
3. (a) What is cultural lag? Identify the main elements of social structure.	2+4	L2	2
(b) Evaluate the importance of understanding social structure from a global perspective.	04	L5	2
4. (a) Explain the contribution of family and religion for socialization?	03	L4	4
(b) Describe the functions of education as a social institution.	03	L2	3
(c) Distinguish between institution and association with relevant examples.	04	L4	3

Section B

There are **four** questions in this section. Answer any **three** questions.

	Marks	*Level (L1-L6)	CLO No.
5. (a) What are the forms of social stratification? Classify.	03	L2	5
(b) Elaborate the major determinants of social stratification.	04	L6	5
(c) What are the consequences of social mobility? Discuss.	03	L2	5
6. (a) What is industrialization? Enumerate the characteristics of industrialization.	2+3	L1	5
(b) How does technology impact on society?	05	L5	5
7. (a) How does deviance differ from crime?	02	L6	6
(b) Critically analyze the strain theory of deviance.	05	L4	6
(c) What are the main causes of Juvenile delinquency? Explain.	03	L2	6
8. Write short notes on the following:			
(a) Neo-colonialism	03	L2	6
(b) Causes of crime	03	L2	6
(c) Discuss the causes of juvenile delinquency and how the family, peer group and media influence youth behavior.	04	L3	6

[Question of Term Final Examination]



Khulna University

School: Life Sciences

Discipline: Agrotechnology

Program: Bachelor

Year: 1st

Term: 1st

Examination Year: 2026

Session: 2025-26

Course Code: 0531 08 Chem 1159

Course Title: Chemistry

Total Marks: 60

Time: 03 hours

Credit: 03

Instructions (if any):

Comments/Remarks (if any):

Section B

There are **FOUR** questions in this section. Answer any **THREE** questions.

Question No.	Question Description	Marks
5.	A chemist claims that in extremely pure water, adding a very tiny amount of strong acid does not significantly change pH. Under what concentration range could this statement become approximately true? [L1; CLO3]	3
	b) Give the mathematical formulation of the first law of thermodynamics. [L5; CLO3]	3
	c) Deduce a relation between ΔH and ΔE [L4; CLO3]	4
6.	a) Derive the relation between K_C and K_P [L1; CLO4]	3
	b) What is Le Chatelier's Principle? Explain with example. [L3; CLO4]	4
	c) State and explain Henry's Law and its limitation. [L5; CLO4]	3
7.	(a) Discuss the SN^2 reaction mechanism of substitution in alkylhalides. Why does SN^2 reaction take place with stereo-chemical inversion?	5
	(b) Describe the mechanism of Aldol condensation.: [L2; CLO5]	5
8.	(a) Name and explain the mechanism of addition of unsymmetrical molecules over an unsaturated double bond. [L3; CLO5]	5
	(b) Define electrophilic substitution and explain the mechanism taking nitration as example. [L4; CLO5]	5

[Question of Term Final Examination]



Khulna University

School: Life Sciences

Discipline: Agrotechnology

Program: Bachelor

Year: 1st

Term: 1st

Examination Year: 2026

Session: 2025-26

Course Code: 0531 08 Chem 1159

Course Title: Chemistry

Total Marks: 60

Time: 03 hours

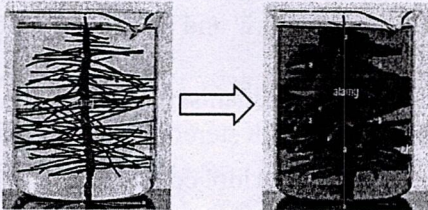
Credit: 03

Instructions (if any):

Comments/Remarks (if any):

Section A

There are **FOUR** questions in this section. Answer any **THREE** questions.

Question No.	Question Description	Marks
1.	a) Explain intensive properties of matter. [L2; CLO1] b) Evaluate the effect of temperature during interconversion of matter. [L4; CLO1] c) Assess the contribution of Bohr's atomic theory to modern chemistry. [L5; CLO1]	3 3 4
2.	a) Sketch the different 'd' orbitals. [L3; CLO1] b) Draw the ionic crystal of NaCl. [L3; CLO1] c) Justify why Cr and Cu do not follow the expected rules of electronic configuration. [L5; CLO1]	3 3 4
3.	a) Determine the amount of 0.610 M NaOH solution needed to neutralize 20.0 mL of 0.245 M H ₂ SO ₄ solution. [L3; CLO2] b) Predict the redox reaction and resulting color change observed when a copper wire is dipped into a solution of silver nitrate. [L4; CLO2]	5 5
		
4.	a. Discuss the advantages and limitations of Beer-Lamert law. [L2; CLO2] b. A radiation has a wavelength of 3000 Å. Calculate its wavelength in meters (m), centimeters (cm), and nanometers (nm). Also determine its wavenumber and frequency. [L3; CLO2]	5 5

Khulna University, Khulna
Agrotechnology Discipline
1st Year, Term-I, Examination 2026; Session: 2025-2026
Course No: 0541 08 Math-1161, Full Title of Course: Mathematics
Full Marks: 60, Time: 03 Hours

- The figures in the margin indicate full marks. The questions are of equal value.
- Use separate sheet for each section.

Section-A

There are **FOUR** questions in this section. Answer any **THREE** questions

		Marks	CLO
1.	(a) Define continuity and differentiability of a function. A function $f(x)$ is defined as follows: $f(x) = \begin{cases} 4x^2 - 3x & \text{for } 1 < x < 2 \\ 3x + 4 & \text{for } x \geq 2 \end{cases}$ Discuss the continuity and differentiability of $f(x)$ at $x=2$.	07	CLO1,2
	(b) If $\sin y = a \sin(a + y)$, then prove that $\frac{dy}{dx} = \frac{\sin^2(a+y)}{\sin a}$	03	CLO2
2.	(a) Find y_n , where $y = \frac{1}{x^2+16}$	03	CLO2
	(b) State Leibnitz's theorem. If $y = \sin(m \sin^{-1} x)$, then prove that (i) $(1 - x^2)y_2 - xy_1 + m^2y = 0$ (ii) $(1 - x^2)y_{n+2} + (2n - 1)xy_{n+1} + (m^2 - n^2)y_n = 0$.	07	CLO1,2
3.	(a) If $u = \sin^{-1} \frac{x}{y} + \tan^{-1} \frac{y}{x}$, then prove that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = 0$.	03	CLO1,2
	(b) If $u = \log(x^3 + y^3 + z^3 - 3xyz)$, then show that $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = \frac{3}{x+y+z}$.	04	CLO1,2
	(c) If $u = x^2y + y^2z + z^2x$, then prove that $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = (x + y + z)^2$	03	CLO1,2
4.	(a) Define maximum and minimum of a function. Find the maximum and minimum values of $2x^3 - 21x^2 + 36x - 20$	06	CLO1,2
	(b) Find the maximum and minimum values of $1 + 2\sin x + 2\cos^2 x$ ($0 \leq x \leq \frac{\pi}{2}$)	04	CLO2

Section-B

- There are **FOUR** questions in this section. Answer any **THREE** questions
5. Integrate any two of the followings: (a) $\int \sqrt{4 + 8x - 5x^2} dx$, (b) $\int \frac{dx}{\cos x + \sin x}$ 10 CLO1,2
 (c) $\int \frac{x-1}{(x-3)(x-2)} dx$
6. Answer any two of the followings: 10 CLO1,2
 (a) Evaluate $\int_0^{\pi/2} \frac{dx}{4+5\sin x}$, (b) Evaluate $\int_1^2 \sqrt{(x-1)(2-x)} dx$
 (c) Evaluate $\lim_{n \rightarrow \infty} \left\{ \frac{n}{n^2 + 1^2} + \frac{n}{n^2 + 2^2} + \frac{n}{n^2 + 3^2} + \dots + \frac{n}{n^2 + n^2} \right\}$
7. (a) Show that $\int_0^{\pi/2} \log \cos x dx = \frac{\pi}{2} \log \frac{1}{2}$ 05 CLO1,2
 (b) Show that $\int_0^1 \frac{\log(1+x)}{1+x^2} dx = \frac{\pi}{8} \log 2$ 05 CLO1,2
8. (a) Find the length of the arc of the parabola $y^2 = 4ax$ measured from the vertex to one extremity of the latus rectum. 05 CLO1,2
 (b) Prove that $B(m, n) = \frac{\Gamma m \Gamma n}{\Gamma(mn)}$ 05 CLO1,2