Printed Page:- 04 Subject Code:- BBT0306

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: III - THEORY EXAMINATION (2024 - 2025)

Subject: Plant and Animal Science

Time: 3 Hours Max. Marks: 100

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A 20

1. Attempt all parts:-

1-a. In a cell, protoplast consists of the following EXCEPT? (CO1, K1) 1

(a) Cell wall

(b) Cell Membrane

(c) Nucleus

(d) Cytoplasm

1-b. What is the name of the bacteria known as natural genetic engineer of plants? (CO1, K1) 1

(a) *Escherichia coli*

(b) *Agrobacterium tumefaciens*

(c) *Pseudomonas aeruginosa*

(d) *Aspergillus niger*

1-c. What is the first step in the process of photosynthesis? (CO2, K1) 1

(a) Joining of three carbon atoms to form glucose

(b) Formation of ATP

(c) Ionization of water

(d) Excitement of an electron of chlorophyll a by a photon of light

1-d. . How many molecules of ATP and $NADPH_2$ are required, respectively, for each molecule of glucose formed in plants? (CO2, K1) 1

(a) 15 and 10

(b) 12 and 18
(c) 18 and 12
(d) 33 and 22

1-e. The light-dependent reactions of photosynthesis occur in the: (CO3, K1) 1

(a) Cytoplasm
(b) Stroma
(c) Thylakoid membrane
(d) Mitochondria

1-f. Which molecule acts as the main energy carrier in the process of photosynthesis?(CO3, K1) 1

(a) ATP
(b) NADPH
(c) FADH2
(d) NADH

1-g. The molecular attraction between water is known as- (CO4, K1) 1

(a) Cohesion
(b) Adhesion
(c) Transpiration
(d) Osmosis

1-h. Special type of epidermal cells composing the stomata is (CO4, K1) 1

(a) guard cells
(b) Nerve cell
(c) Vacuole
(d) Chloroplast

1-i. Which organ is responsible for pumping blood throughout the body? (CO5, K1) 1

(a) Lungs
(b) Heart
(c) Liver
(d) Brain

1-j. Which of the following is NOT a part of the digestive system? (CO5, K1) 1

(a) Stomach
(b) Small intestine
(c) Lungs
(d) Large intestine

2. Attempt all parts:-

2.a. Define the term callus? (CO1, K1) 2

2.b. Where do the light reactions and dark reactions of photosynthesis take place in plant cells? (CO2, K1) 2

2.c.	What is the primary source of carbon for primary consumers in an ecosystem? (CO3, K1)	2
2.d.	Name the three parts of small intestine of man. (CO4, K1)	2
2.e.	In which group of organisms is external fertilization most common? (CO5, K1)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Tabulate the difference between tap root and fibrous root? (CO1, K2)	6
3-b.	Describe the term inflorescence. Name two major types of inflorescences. (CO1, K2)	6
3-c.	Explain what will happen to a plant cell if it is kept in a solution having higher water potential. (CO2, K2)	6
3-d.	Why is aerobic respiration considered more efficient than anaerobic respiration? Provide evidence to support this claim. (CO2, K2)	6
3.e.	What environmental factors affect nitrogen fixation? (CO3, K2)	6
3.f.	Define and differentiate between absorption and assimilation in the context of digestion. (CO4, K2)	6
3.g.	What are the main differences between sexual and asexual reproduction in plants? Discuss the advantages and disadvantages of each method. (CO5, K2)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Stolon, offset and rhizome are different forms of stem modifications. How can these modified forms of stem be distinguished from each other? (CO1, K2)	10
4-b.	Discuss the role of auxin and cytokinenin in plant organogenesis? How direct organogenesis differ from indirect organogenesis? (CO1, K2)	10

5. Answer any one of the following:-

5-a.	Describe the mechanisms and events that occur during Photosystem I and Photosystem II of the light reaction up to the formation of NADPH. (CO2, K2)	10
5-b.	Define osmosis and compare endosmosis with exosmosis.. What essential role does the root endodermis play during mineral absorption in plants? (CO2, K2)	10

6. Answer any one of the following:-

6-a.	Describe the nitrogen cycle in nature. How does nitrogen move through different ecosystems and forms? (CO3, K2)	10
6-b.	How do legumes, such as peas and beans, benefit from their symbiotic relationship with nitrogen-fixing bacteria? Describe this process in detail. (CO3, K2)	10

7. Answer any one of the following:-

7-a.	Explain how urine is formed in the nephron through filtration, reabsorption and secretion. (CO4, K2)	10
7-b.	What is the cardiac cycle? Describe the events during joint diastole and ventricular systole. (CO4, K2)	10

8. Answer any <u>one</u> of the following:-

8-a.	What is reproduction? Explain its two main types and discuss how one type leads to new characteristics in offspring. (CO5, K2)	10
8-b.	Describe the structure and function of the male and female reproductive organs in flowering plants. (CO5, K2)	10