



Department of Genetic Engineering and Biotechnology
Faculty of Health and Life Sciences
B. Sc. (Hons.) in Genetic Engineering and Biotechnology
Final Examination Summer 2026

Course Code: 0512-2203

Level and Term: L2, T2

Time: 2 Hours

Section: 251 (A+B)

Course Title: Plant Physiology

Course Teacher Initials: AR

Total Marks: 40

Answer the Following Questions:

Marks

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| 1 | (a) What is respiration? Calculate how many ATP molecules are produced from one glucose molecule through aerobic respiration when the glycerol-3-phosphate shuttle is used. | [CLO2, PLO1, C1] | 3.0 |
| | (b) Explain the structure and function of the ETC and analyze how reduced coenzymes such as NADH and FADH ₂ contribute to ATP production. | [CLO2, PLO1, C4] | 5.0 |
| 2 | (a) What is plant growth? Explain how plant growth can be measured using changes in different parameters. | [CLO5, PLO2, C2] | 3.0 |
| | (b) A crop initially has a dry weight of 150 g and leaf area of 2.0 m ² ; after 12 days, its dry weight becomes 240 g and leaf area becomes 4.0 m ² in a field area of 15 m ² . Calculate the RGR, CGR, and NAR using the given growth data. Mention the significance of each result. | [CLO5, PLO1, C3] | 5.0 |
| 3 | (a) What are phytohormones? Classify the major plant hormones according to their chemical nature and mention their major sites of synthesis and functions. | [CLO7, PLO1, C2] | 4.0 |
| | (b) What is <u>growth retardant</u> ? Explain the interactions of hormones in plant growth and development. | [CLO7, PLO2, C4] | 4.0 |
| 4 | (a) What is photoperiod? Discuss how photoperiod regulate flowering through the actions of different genes. | [CLO8, PLO1, C6] | 4.0 |
| | (b) Explain why vernalization is important and <u>analyze how cold treatment suppresses the FLC gene to promote flowering.</u> | [CLO8, PLO2, C5] | 4.0 |
| 5 | (a) Describe the major structural features of a seed with a suitable illustration. State why a seed is important. | [CLO7, PLO2, C1] | 4.0 |
| | (b) What is <u>seed viability</u> ? Explain how suitable artificial treatments can break dormancy and induce germination in a dormant seed. | [CLO7, PLO2, C3] | 4.0 |