


VIT

 Vellore Institute of Technology
(Affiliated to the University of Applied Sciences, Vellore)
Final Assessment Test – November 2025

Course: BABIT100 - Biology

Class NBR(s): 7003

Time: Three Hours

Slot: C1+TC1+TCC1

Max. Marks: 100

- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

COs	CO Statements
CO1	Recall the basic concepts of biology including diversity, evolution and ecology.
CO2	Outline the design principles and functionality of cells.
CO3	Explain the molecular and physical aspects of cellular operations.
CO4	Correlate the biological flow of information at molecular and hereditary levels.
CO5	Summarize the organismal complexities and physiology in living systems as well as outline the key intersections of biology with engineering disciplines.

BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)

Answer ALL Questions

(10 X 10 = 100 Marks)

1. Explain the concept of evolution through natural selection. Illustrate your answer with an example from a population of organisms (such as moths, finches, or bacteria) to show how variation, competition, and selection pressures drive adaptation and ultimately lead to the formation of new species. CO1 BL1

2. a) Illustrate the levels of ecological organization using a labeled diagram. Explain the significance of each level in understanding ecosystem structure and function. [5] CO1 BL1
 b) What would happen to the cell if [5*1=5]
 - i. The plasma membrane breaks down.
 - ii. There is no endoplasmic reticulum.
 - iii. There is no ribosome.
 - iv. The mitochondria stop functioning.
 - v. The nucleus is removed from the cell.

3. Discuss the key similarities and differences between mitosis and meiosis. Explain how these processes ensure both genetic stability and diversity in multicellular organisms. CO2 BL2

4. What is the Signal Hypothesis? Explain its key steps involved in the targeting and translocation of proteins into the endoplasmic reticulum with a suitable diagram or flowchart. CO2 BL2

5. ✓ a) Explain the structure and different levels of organization of proteins (primary, secondary, tertiary, and quaternary). Discuss how protein structure determines its function with one suitable example. Also, list the types of bonds involved in the stabilization of the tertiary structure of the protein. [6] CO3 BL1

b) Describe the structure, classification, and biological significance of carbohydrates. [4]

6. ✓ "The electron transport chain generates most of the ATP during cellular respiration." Enlist the main components of the ETC and draw a flowchart showing the sequence of electron carriers and proton movement, and explain how the proton gradient drives ATP synthesis. CO5 BL2

7. ✓ a) Explain Mendel's dihybrid cross experiment involving two contrasting traits with a suitable example. Illustrate the cross using a neat, labeled Punnett square and state the phenotypic ratio obtained. [5] CO4 BL2

b) Explain the concepts of linkage and crossing over with a suitable example. [5]

8. ✓ a) Describe the process of DNA replication in prokaryotic cells with a suitable diagram. Highlight the role of helicase, DNA polymerase, and ligase in DNA replication. [8] CO4 BL2

b) Suppose the template strand of DNA in a gene has the sequence 3' TACGGTACG 5'. What will be the sequence of the (i) coding strand and (ii) mRNA transcribed from it? [2]

9.a) ✓ Differentiate between: [4*2.5= CO3 BL1
10]
i. Structural difference between chitin and cellulose
ii. Smooth ER and rough ER
iii. Saturated and Unsaturated lipids
iv. Glycolysis and Krebs cycle

OR

9.b) ✓ Differentiate between: [4*2.5= CO3 BL1
10]
i. DNA and RNA
ii. Prokaryotes and Eukaryotes
iii. Microtubules vs microfilaments
iv. Glycosidic and Peptide bonds

10.a) ✓ Discuss any two of the following, emphasizing structure and function: [2*5= CO5 BL2
10]
i. Plant tissue systems
ii. Animal organ systems and homeostasis
iii. Homeostatic mechanisms in temperature regulation

OR

10.b) Explain any two of the following concepts with suitable examples, [2*5= CO5 BL2, highlighting their principles and applications: 10]

- i. Biosensor
- ii. Nanoparticle in drug delivery
- iii. Bio-inspired Design

U/K/TY