

KAMARAJ COLLEGE (Autonomous)

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(4 Pages)

Reg. No:.....

Question Code: 26E03502

Course Code : 24PMBO42

PG Degree - End Semester Examinations, April 2026

Fourth Semester

M.Sc., BOTANY

Biochemistry & Applied Biotechnology

(For those who joined in July 2024 onwards)

Time : 3Hours

Maximum : 75 Marks

PART - A (10 X 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer:

- CO:1 1. Molecules in which the atoms are held together by _____ bonds
K:1 have the strongest chemical linkages.
- (a) Hydrogen (b) Covalent
(c) Noncovalent (d) Ionic
- CO:1 2. Which of the following solutions will act as a buffer?
K:2
- (a) HNO_2 and NaNO_2 (b) HCl and KCl
(c) HNO_3 and NH_4NO_3 (d) NaOH and NaCl
- CO:2 3. Which of the following amino acids contains a sulfur atom in its
K:1 side chain R-group?
- (a) Glutamine (b) Cysteine
(c) Lysine (d) Serine
- CO:2 4. The repeating units of proteins are
K:2
- (a) Glucose units (b) Amino acids
(c) Fatty acids (d) Peptides
- CO:3 5. In the feedback regulation, the end product binds at
K:1
- (a) Active site (b) Allosteric site
(c) E-S complex (d) None of these

- CO:3 6. Terpenoids provides the plants
K:2 (a) Taste and Smell (b) Shape
(c) Size (d) Growth
- CO:4 7. Polymerase chain reaction was invented by_____
K:1 (a) Hargobind khorana (b) James watson
(c) John Hopkins (d) Kary mullis
- CO:4 8. Western blotting is the technique for the identification of
K:2 (a) DNA (b) Carbohydrates
(c) Proteins (d) RNA
- CO:5 9. Name the enzyme involved in the conversion of complex sugars
K:1 into simple sugars during digestion.
(a) Protease (b) Kinase
(c) Amylase (d) Zeamase
- CO:5 10. Identify the organism used in alcoholic fermentation
K:2 (a) *Pseudomonas* (b) *Pencillium*
(c) *Aspergillus* (d) *Saccharomyces*

PART - B (5 X 5 = 25 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 250 words.

- CO:1 11. (a) Classify acids and bases according to different acid-base
K:4 theories.

(OR)

(b) Distinguish between free energy and entropy.

- CO:2 12. (a) Discuss the structure and properties of disaccharides.

K:3 **(OR)**

(b) Describe the structure and functions of cholesterol.

- CO:3 13. (a) List out the various factors affecting enzyme action.

K:4 **(OR)**

(b) Analyze the different types of flavonoids with bioactive properties.

CO:4 14. (a) Differentiate between southern and Northern blotting
K:4 techniques.

(OR)

(b) Describe the process and benefits of antisense technology in delaying fruit ripening.

CO:5 15. (a) Elaborately explain the different types of the fermentation
K:3 techniques.

(OR)

(b) Summarize the industrial production of alcohol.

PART - C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 600 words.

CO:1 16. (a) Discuss the different types of chemical bonds (Covalent and
K:3 Hydrogen bonds) with examples.

(OR)

(b) Discuss the laws of thermodynamics.

CO:2 17. (a) Classify amino acids based on their structure.

K:5

(OR)

(b) Justify the role of Primary and secondary structures in protein organization.

CO:3 18. (a) Explain the mechanism of enzyme action with reference to
K:5 the Michaelis – Menton constant.

(OR)

(b) Describe the structure and properties of alkaloids.

CO:4 19. (a) Explain the principle involved in ELISA and add its
K:4 applications.

(OR)

(b) How *Agrobacterium* mediated transformation is different from other genetic transformation system? Discuss.

CO:5 20. (a) Discuss the industrial production of penicillin and explain the
K:6 role of fermentation in this process.

(OR)

(b) Design a bioremediation strategy using In situ and Ex situ methods.