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(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2024 ONLY)

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REG.NO. :

N.G.M. COLLEGE (AUTONOMOUS), POLLACHI
END-OF-SEMESTER EXAMINATIONS: APRIL- 2026

B.Sc.-BOTANY **MAXIMUM MARKS: 75**
SEMESTER: IV **TIME : 3 HOURS**

PART - III

CELL BIOLOGY, BIOPHYSICS & BIOCHEMISTRY

SECTION – A **(10 X 1 = 10 MARKS)**

ANSWER THE FOLLOWING QUESTIONS.

MULTIPLE CHOICE QUESTIONS. **K1**

1. The cell wall of a plant is primarily composed of_____.
   a) Chitin b) Cellulose
   c) Peptidoglycan d) Glycogen
2. Pauli's Exclusion Principle states that: _____.
   a) No two electrons in an atom can have the same set of four quantum numbers
   b) All electrons in an atom must have opposite spins
   c) Electrons fill orbitals in order of increasing energy
   d) Electrons in the same subshell occupy orbitals singly before pairing
3. Which type of filter paper are mostly used in paper chromatography?
   a) Butter paper b) Sample paper
   c) Whatmann No. 1 filter paper d) Filter paper
4. Which one of the following is the simplest form of carbohydrates?
   a) Monosaccharides b) Disaccharides
   c) Polysaccharides d) Oligosaccharides
5. What are non-protein organic molecules that assist enzymes, often derived from vitamins?
   a) Cofactors b) Coenzymes
   c) Inhibitors d) Hormones

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES. **K2**

6. What are dictyosomes?
7. Comment on energy states of atom.
8. List the components of a centrifuge.
9. What are the four major classes biomolecules found in living organisms?
10. Give examples for coenzymes.

SECTION – B **(5 X 5 = 25 MARKS)**

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. K3

11. a) Outline the ultrastructure of a plant cell.

(OR)

b) Brief the sequence of events in mitosis.

(CONTD…….2)

12.a) Discuss the importance of Van der Waals forces.

(OR)

b) What is electron spin? Explain the applications of electron spin.

13. a) Explain the working principle of pH meter.

(OR)

b) Describe in brief the types and applications of paper chromatography.

14. a) Outline the primary functions of DNA and RNA.

(OR)

b) How will you classify lipids? Briefly explain their functions.

15. a) List the major classes of enzymes.

(OR)

b) Organize the primary role of coenzymes in metabolic reactions.

SECTION – C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. K4 & K5

16. a) Elaborate the structure and functions of mitochondria.

(OR)

b) Compare the structure and properties of polytene and lamp brush chromosomes.

17. a) Categorize the first and second laws of thermodynamics.

(OR)

b) Analyze the properties of covalent, non-covalent and ionic bonds.

18. a) What is the principle of centrifugation? Elaborate the types of centrifuges.

(OR)

b) Interpret the importance of Agarose and Polyacrylamide Gel Electrophoresis.

19. a) Classify carbohydrates with suitable examples.

(OR)

b) Elucidate the four levels of protein structure.

20. a) Elaborate the properties and major functions of enzymes.

(OR)

b) What are the main factors affecting enzyme activity? Explain in detail.

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