



S.V.K.P. & Dr. K.S. RAJU ARTS & SCIENCE COLLEGE
(Autonomous)

Recognized by UGC as "College with Potential for Excellence"

Accredited by NAAC with "A" Grade

(Affiliated to ADIKAVI NANNAYA UNIVERSITY - Recognised by Govt. of Andhra Pradesh)

PENUGONDA-534 320, West Godavari District., (A.P.)

BIOTECHNOLOGY	CODE: 23BSC12	2023-24	B.Sc.
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Semester – I

BIOTECHNOLOGY

Time: 3 Hours

Paper – 23BSC12

MODEL QUESTION PAPER

Max. Marks:70

INTRODUCTION TO APPLIED BIOLOGY(23BSC12)

SECTION – A

Choose the Correct Answer for the following Questions

30 X 1 =30 M

- Who is considered the "Father of Microbiology"?
a. Louis Pasteur b. Anton van Leeuwenhoek c. Robert Koch d. Joseph Lister
- Who developed the first successful vaccine for smallpox?
a. Robert Koch b. Edward Jenner c. Paul Farmer d. Alexander Fleming
- Which bacterial structure is responsible for locomotion and movement?
a. Flagellum b. Capsule c. Ribosome d. Cell wall
- What is the primary function of the immune system?
a. Digestion b. Protection against disease c. Oxygen transport d. Muscle contraction
- Which type of immunity is present at birth and provides immediate defense against pathogens?
a. Adaptive immunity b. Acquired immunity c. Innate immunity d. Passive immunity
- Antibodies are produced by which cells of the immune system?
a. T cells b. B cells c. Natural killer cells d. Macrophages
- What is the main function of memory cells in the immune system?
a. Produce antibodies b. Provide immediate defense
c. Remember previous infections d. Engulf pathogens
- Which immunoglobulin is involved in allergic reactions?
a. IgA b. IgG c. IgE d. IgM
- Which of the following is a monosaccharide?
a. Starch b. Glycogen c. Glucose d. Cellulose
- Why are omega-3 and omega-6 fatty acids considered essential?
a. They provide energy. b. They are vital for membrane structure.
c. The body cannot synthesize. d. They regulate body temperature.

11. How many standard amino acids are commonly found in proteins?
a. 10 **b.** 15 **c.** 20 **d.** 25
12. What type of bond is formed between amino acids during protein synthesis?
a. Peptide bond **b.** Ionic bond **c.** Covalent bond **d.** Hydrogen bond
13. What are the three components of a nucleotide?
a. Sugar, phosphate, & amino group **b.** Sugar, phosphate, & nitrogenous base
c. Fatty acid, phosphate, & nitrogenous base **d.** Sugar, fatty acid, & nitrogenous base
14. Which nitrogenous base is present in RNA but not in DNA?
a. Adenine **b.** Thymine **c.** Uracil **d.** Cytosine
15. What is the primary purpose of catabolic reactions in the body?
a. Build complex molecules **b.** Store energy
c. Break down complex molecules **d.** Synthesize ATP
16. Which of the following is an application of genetic engineering in medicine?
a. Producing genetically modified crops **b.** Cloning animals for research
c. Creating transgenic mice **d.** Producing human insulin using bacteria
17. Which of the following is a genetically engineered crop used for pest resistance?
a. Golden rice **b.** Bt cotton **c.** Roundup Ready soybeans **d.** Hybrid maize
18. Which of the following is a well-known nitrogen-fixing bacterium used as a biofertilizer?
a. Escherichia coli **b.** Bacillus subtilis **c.** Rhizobium spp. **d.** Pseudomonas aeruginosa
19. Which enzyme is essential for DNA synthesis in PCR?
a. DNA ligase **b.** Taq DNA polymerase **c.** RNA polymerase **d.** Helicase
20. What is the purpose of adding a loading dye to DNA samples in gel electrophoresis?
a. To amplify DNA **b.** To cut DNA at specific sites
c. To visualize DNA under UV light **d.** To separate DNA fragments
21. What is the primary purpose of immunoblotting (Western blot)?
a. DNA analysis **b.** Protein analysis **c.** RNA analysis **d.** Cell counting
22. In competitive ELISA, what competes for binding to the immobilized antigen?
a. Antibodies in the sample **b.** Enzyme-labeled antibodies
c. Blocking agents **d.** Substrate molecules
23. How are monoclonal antibodies produced?
a. Isolation from human serum **b.** Fusion of B cells and myeloma cells
c. Direct synthesis in a laboratory **d.** Injection into animals for immune response

24. How do monoclonal antibodies work in cancer therapy?
 - a. Inducing inflammation
 - b. Inhibiting cell division
 - c. Enhancing viral replication
 - d. Promoting angiogenesis
25. What is eugenics?
 - a. Study of genetics
 - b. Improvement of human genetic traits
 - c. Treatment of genetic disorders
 - d. Analysis of gene expression
26. Which genetic disorder has been successfully treated with gene therapy?
 - a. Huntington's disease
 - b. Cystic fibrosis
 - c. Duchenne muscular dystrophy
 - d. Sickle cell anemia
27. Which of the following is a widely used biological database for protein sequence information?
 - a. iTunes
 - b. GenBank
 - c. Amazon
 - d. Netflix
28. What does the standard deviation measure in a set of data?
 - a. Central tendency
 - b. Spread or dispersion
 - c. Skewness
 - d. Kurtosis
29. What is the median in a dataset?
 - a. The most frequently occurring value
 - b. The middle value when the data is arranged in ascending order
 - c. The average of all values
 - d. The range of the data
30. What is the mode of the dataset: 2, 4, 5, 6, 2, 7, 8, 2?
 - a. 2
 - b. 6
 - c. 5
 - d. 7

SECTION – B

Fill in the Blanks for the following Questions

10 X 1 =10 M

31. Microorganisms play a key role in the _____ of bread and other bakery products.
32. Certain bacteria are employed in the nitrogen-fixing process in agriculture to enhance _____ fertility.
33. The process by which a protein loses its structure and function due to heat or chemical exposure is called _____.
34. The primary goal of anabolism is to store and utilize _____.
35. Bioremediation is a process where microorganisms are used to degrade and detoxify _____ pollutants in the environment.
36. The enzyme _____ is used to cut both the foreign DNA and the cloning vector at specific sites.
37. Hybridoma cells are often cultured in HAT media, which stands for _____.
38. During the denaturation step of PCR, the DNA template is heated to a high temperature, causing the double-stranded DNA to _____ into single strands. Answer: denature
39. NCBI, which stands for _____, is a part of the United States National Library of Medicine (NLM).
40. EBI, which stands for _____, is part of the European Molecular Biology Laboratory (EMBL).

SECTION – C

Write the following very Short Answer Questions?

10 X 1 =10 M

41. Define Microbiology
42. Describe about Secondary Lymphoid Organs.
43. What are Proteins?
44. What are Nucleic Acids?
45. Define Genetic Engineering
46. What are Biopesticides
47. What does Elisa stand for?
48. What are Monoclonal Antibodies (Mabs)?
49. Define Mean
50. Define Range

SECTION – D

Match the following

2 X 5 =10 M

- | | | |
|-----|---------------------------|----------------------------------|
| 51. | a) Golden Rice | i) First cloned mammal |
| | b) Flavr Savr Tomato | ii) Glyphosate tolerance |
| | c) Dolly the Sheep | iii) Increased vitamin A content |
| | d) Roundup Ready Soybeans | iv) Enhanced shelf life |
| | e) GloFish | v) Fluorescent coloration |
| 52. | a) Glucose | i) monosaccharide |
| | b) Starch | ii) RNA |
| | c) Thiamine | iii) milk sugar |
| | d) Uracil | iv) polysaccharide |
| | e) Lactose | v) DNA |

SECTION – E

Choose the TRUE or FALSE for the following Questions.

10 X 1 =20

53. Viruses are considered living organisms.
54. Fungi can reproduce both sexually and asexually.
55. Lipids are hydrophobic molecules.
56. Amino acids are the building blocks of nucleic acids.
57. In plant biotechnology, tissue culture techniques are commonly used for mass propagation of plants with desirable traits.
58. In animal biotechnology, the use of in vitro fertilization (IVF) is limited to human reproduction and not applicable to livestock breeding.
59. Gene therapy involves the direct manipulation of an individual's DNA to treat or prevent genetic diseases.
60. Gel electrophoresis is a key step in DNA fingerprinting, separating DNA fragments based on their size.
61. Genomics involves the analysis of entire sets of genes and their DNA sequences.
62. Proteomics is primarily concerned with the study of DNA sequences and their variations.

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PENUGONDA-534 320, West Godavari District., (A.P.)

II Semester (w.e.f. 2023-24 Admitted Batch)

BIOTECHNOLOGY	CODE : 23BT21	2023-24	B.Sc.
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Semester – II
Paper – 23BT21

BIOTECHNOLOGY
MODEL QUESTION PAPER
(23BT21-Analytical Techniques)

Time: 3 Hours
Max. Marks: 70

Part – 1

Answer any five questions choosing at least two from each section. Each question carries 10 marks.

5x10=50 marks

Section-A

1. Explain about classification of Carbohydrates?
2. Write about Classification of Protein?
3. Describe about Structure and function of DNA?.
4. Explain about Structure, Function and Deficiency of Vitamin A&D
5. Write about Principle and Types of Centrifugation

Section-B

6. Describe about Ion exchange Chromatography
7. Write about principles & Applications of Spectrophotometer
8. Write about Compound Microscopy and its Applications?
9. Explain about Mean and Median
10. Describe about ANOVA?

Part – 2

Answer any five questions. Each question carries 4 marks.

5x4=20 marks

11. Unsaturated Fatty Acids
12. Peptide Bond
13. Vitamin -C
14. Glycolysis
15. Paper Chromatography
16. Radioisotopes
17. Mode
18. Chi-Square Test



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II Semester (w.e.f. 2023-24 Admitted Batch)

BIOTECHNOLOGY	CODE: 23BT22	2023-24	B.Sc.
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Semester – II
Paper – 23BT22

BIOTECHNOLOGY
MODEL QUESTION PAPER
(MICROBIOLOGY, CELL BIOLOGY)

Time: 3 Hours
Max. Marks: 70

Part – 1

Answer any five questions choosing at least two from each section. Each question carries 10 marks. **5x10=50 Marks**

Section-A

1. Describe about the ultra structure of Bacteria?
2. What is sterilization? Write about different sterilization methods?
3. Write about Nutritional classification of Bacteria?
4. Describe about Microbial production of Penicillin?
5. Write about the structure and function of Mitochondria and Golgibodies ?

Section-B

6. Describe about Mitotic cell division and its significance?
7. Write about Chemical composition and dynamic nature of cell membrane?
8. Write about cell signaling and communication mechanism?
9. Describe about enzymes involved in DNA Replication?
10. Explain about different DNA repair mechanisms?

Part – 2

Answer any five questions. Each question carries 4 marks. **5x4=20 Marks**

11. Louis Pasture
12. Bacterial Growth curve
13. HIV
14. Fungi
15. Nucleus
16. Cell surface receptors
17. RNA Polymerase
18. Termination of Translation