DEPARTMENT OF BIOTECHNOLOGY

Question bank

BIOTECHNOLOGY

SEMESTER I

PAPER I :Microbiology

1. Describe contribution of Louis Pasture in detail. 5M
2. Explain about acidic, basic and neutral stains. 5M
3. Explain in detail about endospores. 5M
4. Write a detailed note on cell cycle. 10M
5. Draw a well labelled diagram of typical bacterial cell with bacterial morphology. 10M
6. Describe brief idea about Bergeys Manual. 05M
7. Explain difference between selective and differential media. 10M
8. Explain in detail various phases of growth curve. 10M

9. Discuss the classification of micro-organisms on the basis of pH and temperature. 10M

10. Explain use and working of a chemostat. 05M

11. Describe temperature as a physical agent for microbial control.

12. Describe filtration as a method of microbial control. 10M

13. Describe any two chemical methods for microbial control. 05M

14. Describe the structure and functions of Golgi complex. 10M

15. Write a note on endoplasmic reticulum. 05M

16. What is lysosome? Explain its functions. 05M

17. Describe various stages of mitosis 10M

18. Write a note on neuromuscular junctions 05M

19. Write a detailed note on cell cycle. 10M

20. Define pure culture. 01M

21. What is synchronous culture. 01M

22. What is generation time? 01M

23. Explain in detail about endospores. 05M

24. Write a detailed note on cell cycle. 10M

25. Draw a well labelled diagram of typical bacterial cell with bacterial morphology. 10M

26. Describe brief idea about Bergeys Manual.

27. Explain difference between selective and differential media. 10M

28. Describe filtration as a method of microbial control. 10M

29. Describe any two chemical methods for microbial control. 05M

30. Describe the structure and functions of Golgi complex. 10M

31. Write a note on endoplasmic reticulum. 05M

32. What is lysosome? Explain its functions. 05M

33. Describe brief idea about Bergeys Manual. 05M

34. Explain difference between selective and differential media. 10M

35. Explain in detail various phases of growth curve. 10M

36. Discuss the classification of micro-organisms on the basis of pH. 05M

37. What is differential staining ? Describe the principle and procedure of gram staining. 10

38. Describe the principle, construction and applications of transmission electron microscope. 10

39. Describe the structure of gram positive bacterial cell wall, in detail. 10

40. Describe the process of endospore formation in bacteria. 10

41. Describe in detail the lytic cycle of T4 phage. 10

42. Write a note on viral symmetry. 5

43. Write a note on classification of viruses on the basis of nucleic acid. 5

44. What are non synthetic media ? Explain with suitable examples. 5

45. How bacteria can be classified on the basis of nutritional requirement ? 5

46. What are micronutrients and macronutrients ? Give one example each. 5

47. Explain enriched and enrichment media with suitable examples. 5

48. What is numerical aperture ? 1

49. Write one example of basic dye. 1

50. Which oil is used while using oil immersion objective ? 1

51. Flagella are made of which protein ? 1

52. What is meant by staphylococci ? 1

53. Define plasmid. 1

54. Name one group of archea. 1

55. What is a phage ? 1

56. Write one example of animal virus. 1

57. What is a differential medium ? 1

58. What is a source of Agar-Agar ? 1

59. What is peptone ? 1

DEPARTMENT OF BIOTECHNOLOGY

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BIOTECHNOLOGY

SEMESTER I

PAPER II : Macromolecules

1. Describe the detailed Watson and Crick Model of DNA. 05M
2. Concept of Slit gene write note. 02M
3. Write a short note on prokaryotic gene. 02M
4. Arrangement of histones in the octamer. 02M
5. Describe the primary structure of protein with end group analysis. 10M
6. What are amino acid? Describe the reaction of amino acids with Edmans reagent. 10M
7. Describes in detail the α-Helical and β-Plated sheet structure of proteins. 05M
8. Describe the forces that stabilize the tertiary structure of protein. 05M
9. Describe the titration curve of amino acid. 05M
10. Write a short note on c- value and c- value paradox. 02M
11. Write a short note telomere and centromere. 02M
12. Describe the domains with motifs and folds. 05M

13. Describe the secondary structure of protein. 05M
14. Add note on A and Z form of DNA. 05M
15. Give a detailed account of Maxam Gilbert Method of DNA sequencing. 10M
16. Describe in detail about Watson and crick model of DNA. 5M
17. Difference between prokaryotic gene and eukaryotic gene. 5M
18. Explain in detail classification of amino acid. 5M
19. Write down about quaternary structure of protein. 5M
20. Describes in detail the α-Helical and β-Plated sheet structure of proteins. 05M
21. Describe the forces that stabilize the tertiary structure of protein. 05M
22. Describe the titration curve of amino acid. 05M
23. Write a short note on c- value and c- value paradox. 02M
24. Write a short note telomere and centromere. 02M
25. Write a short note on prokaryotic gene. 02M
26. Arrangement of histones in the octamer. 02M
27. Write short notes on : (a) Structure of tRNA. 5
28. Forces stabilizing nucleic acid structure. 5
29. Explain in detail the Maxam and Gilbert DNA sequencing method. 10
30. Write short notes on : (a) Concept of splitgenes 5
31. Telomere and centromere. 5
32. C-value and C-value paradox. 5

33.10 nm fibre and 30 nm fibre. 5

34. Write the chemical structures of two acidic and two basic amino acids. 5

35. Write a note on C-terminal analysis reaction. 5

36. Write a note on nutritional classification of amino acids. 5

37. Discuss the Ninhydrin reaction with amino acids. 5

38. Describe the structure of myoglobin. 5

39.Write a note on a-helix of protein. 5

40.Discuss in detail the forces stabilizing the tertiary structure of proteins. 10

41.What is base stacking ? 1

42.Draw the structure of a DNA nucleotide. 1

43. Name any two unusual bases found in t-RNA. 1

44. How many histones are present in a nucleosome ? 1

45.What are linkers ? 1

46.What is a scaffolding protein ? 1

47. Name any two aromatic amino acids. 1

48.What is a Zwitter ion ? 1

49. Name any one end opeptidase used for protein sequence determination. 1

50. Name one a-helix destabilizing amino acid. 1

51. What are oligomeric proteins ? 1

52. How many amino acids are present in a b-bend ? 1

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DEPARTMENT OF BIOTECHNOLOGY

Question bank

BIOTECHNOLOGY

SEMESTER II

PAPER I : Macromolecules Microbiology & Cell Biology

1. Explain in detail various phases of growth curve. 10M
2. Discuss the classification of micro-organisms on the basis of pH and temperature. 10M
3. Explain use and working of a chemostat. 05M
4. Describe temperature as a physical agent for microbial control . 05M
5. Describe filtration as a method of microbial control. 10M
6. Describe any two chemical methods for microbial control. 05M
7. Describe the structure and functions of Golgi complex. 10M
8. Write a note on endoplasmic reticulum. 05M
9. What is lysosome? Explain its functions. 05M

10. Describe various stages of mitosis 10M

11. Write a note on neuromuscular junctions 05M

12. Write a detailed note on cell cycle. 10M

13. Define pure culture. 1M

14. What is synchronous culture. 1M

15. What is generation time? 1M

16. Describe in detail physical conditions required for growth. 5M

17. Explain mechanism of cell injury and what is sterilization? 5M

18. Describe about ER, lysosomes and nucleus. 5M

19. Write down in detail about mitosis and meiosis. 5M

20. What is generation time? 1M

21. Draw and explain various phases of a typical bacterial growth curve. 10

22. Write notes on : (a) Chemostat 5

23. Turbidostat. 5

24. Describe various chemical agents used for microbial control. 10

25. Describe various mechanisms of cell injury to control the growth of microorganisms. 10

26. Describe in detail the structure and functions of Golgi complex and peroxisomes. 10

27. Give a detailed account of nucleus and ER. 10 4. Describe the various phases of cell cycle. 10

28. Write notes on : (a) Neuromuscular junction 5

29. Mitosis. 5

30. What is generation time ? 1

31. What is synchronous culture ? 1

32. What is meant by mesophilic organisms ? 1

33. What is the effect of UV-rays on DNA ? 1

34. What is a germicide ? 1

35. What is meant by microbiostasis ? 1

36. Write the function of lysosomes. 1

37. Write the functions of vacuoles. 1

38. Which type of ER are involved in protein synthesis ? 1

39. What is a synapse ? 1

40. What are microtubules ? 1

41. Name the cells responsible for formation of myelin sheath. 1

42.1. Draw and explain various phases of a typical bacterial growth curve. 10

43.Write notes on : (a) Chemostat 5

44. Turbidostat. 5

45. Describe various chemical agents used for microbial control. 10

46.Describe various mechanisms of cell injury to control the growth of microorganisms. 10

47.. Describe in detail the structure and functions of Golgi complex and peroxisomes. 10

48.Give a detailed account of nucleus and ER. 10 Describe the various phases of cell cycle. 10 Write notes on : Neuromuscular junction 5

49.Mitosis. 5

50. What is generation time ? 1

51. What is synchronous culture ? 1

52. What is meant by mesophilic organisms ? 1

53. What is the effect of UV-rays on DNA ?

54. What is a germicide ? 1

55. What is meant by microbiostasis ? 1

56. Write the function of lysosomes. 1

57. Write the functions of vacuoles. 1

58. Which type of ER are involved in protein synthesis ? 1

59. What is a synapse ? 1

60. What are microtubules ? 1

61. Name the cells responsible for formation of myelin sheath. 1

62. Describe in detail the growth curve and its phases. 10

63. Describe different methods of obtaining continuous culture of bacteria. 10

64.. Describe the mechanism of cell injury. 10

65. Write short notes on :

66. Surface tension - a method of physical control of microbes 2½

67. Dry heat sterilization 2½

68. Osmotic pressure 2½

69. Concept of biological control. 2½

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Question bank

BIOTECHNOLOGY

SEMESTER II

PAPER II : Cell Constituents & Enzymology

1. Describe in detail classification and nomenclature of carbohydrates.10M
2. What are Homopolysaccharides? Draw and describe the structure of Starch and Glycogen. 10M
3. Describe the structure of Triglycerides 2½M
4. Describe the structure of Sphingolipids 2½M
5. Saturated and unsaturated fatty acids 2½M
6. Draw the flow diagram for classification of lipids. 2½M
7. Write short notes on: Classification of terpenes 05M
8. Iodine and saponification value. 05M

9. . Discuss in detail classification and nomenclature of enzymes with example and elaborate on E.C. number. 10M

10. Describe in detail the concept of isoenzymes and multi enzymes with suitable examples. 10M

11. Derive Michaelis-Menten equation and its transformation into equations for straight lines. 10M

12. Write notes on: Effect of pH on enzyme activity 2½M

13. Competitive inhibition 2½M

14. Effect of temperature on enzyme activity 2½M

15. Coupled enzyme assay. 2½M

16. Explain the structure of monosaccharides. 2 ½ M

17. What is saponification value and iodine value. 2 ½ M

18. Describe about concept of isoenzymes with lactate dehydrogenase. 10M

19. Explain Michaelis -Menten equation. 2 ½ M

20. Discuss in detail classification and nomenclature of enzymes with example and elaborate on E.C. number.10M

21. Write notes on : Starch 5

22. Sucrose and maltose 5

23. Glycogen 5

24. Classification of carbohydrates. 5

25. What are triglycerides ? Describe the classification of triglycerides in detail. 10

26. Describe glycero-phospholipids and sphingolipids in detail. 10

27. Describe the Lock and Key model of enzyme specificity. 2½

28. Describe any one multienzyme complex. 2½

29. Explain the terms cofactors and co-enzymes. 2½

30. What are zymogens ? Explain with suitable examples. 2½

31. Describe allosteric enzyme. 2½

32. Write a note on induced-fit model of enzyme specificity. 2½

33. Describe the structure and function of LDH. 2½

34. Describe the mechanism of metal ion catalysis. 2½

35. Derive the Michaelis-Menten equation. How is it transformed into Lineweaver-Burke equation ? 10

36. What is enzyme inhibition ? Describe reversible inhibition along with their LB plots. 10

37. What is a reducing sugar ? 1

38. Write the structural formula of α-D-Glucopyranose. 1

39.)Give one example of heteropolysaccharide. 1

40. What are waxes ? 1

41. Define saponification value. 1

42. What are steroids ? 1

43. What is turnover number ? 1

44. Define allosteric site. 1

45. What is meant by single reciprocal plot ? 1

46. What is a holoenzyme ? 1

47. What is Katal ? 1

48. Give an example of irreversible enzyme inhibition. 1

49. What are homopolysaccharides ?

50. Describe the structure of starch. 10

51. Describe in detail the structure of Glycosaminoglycans. 10

52.. Write short notes on :

53. Simple triglycerides 2½

54. Acid value of fats 2½

55. Lecithins 2½

56. Structure of cholesterol. 2½

57. Describe the classification of lipids. 2½

58.) Describe Saponification value of fat. 2½

59. Describe unsaturated fatty acids. 2½

60. Describe the structure of gangliosides. 2½

61. What are isoenzymes ? Explain with a suitable example. 5

62. Explain the mechanism of metal ion catalysis. 5

63.) Describe the classification of enzymes with suitable example. 5

64. Explain the models of enzyme action. 5

65. Explain competitive, uncompetitive and noncompetitive Inhibition in detail. 10

66. Write the various spectrophotometric methods for assay of enzymes. 10

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BIOTECHNOLOGY

SEMESTER III

PAPER I : Metabolism

1. Describe Gluconeogenesis in detail. 10M

2. Describe the entry of fructose into glycolysis. 05M

3. Write a note on creatine phosphate and phosphoenol pyruvate with their structures. 05M

4. Describe Chemiosmotic theory of Oxidative Phosphorylation with suitable diagram.

5. Describe the reactions of the Fatty Acid Synthase Complex. 10M

6. Explain Ketosis and Ketoacidosis in Physiology and Pathology. 05M

7. Describe the synthesis of unsaturated fatty acids. 05M

8. Describe urea cycle reactions in detail with its regulation. 10M

9. Write note on Salvage pathways of purines. 05M

10. Write note on Decarboxylation of amino acids. 05M

11. What is DGº'? 01M

12. What is the role of ATP in Metabolism? 01M

13. What is Redox Potential? 01M

14. Name one inhibitor of ETC. 01M

15. F1 F0 ATPase is involved in which process in the ce 01M

16. Describe the mechanism of proton-gradient generation. 10M

17. Describe the reactions of TCA Cycle in detail. 10M

18. Describe the entry of fructose into glycolysis. 05M

19. Write a note on creatine phosphate and phosphoenol pyruvate with their structures. 05M

20. Describe Chemiosmotic theory of Oxidative Phosphorylation with suitable diagram. 10M

21. Describe glycolysis and its regulation. 10

22. Structure of ATP and phosphoenolpyruvate 5

23. Bypass reactions of gluconeogenesis. 5

24. Describe the ETC in detail. 10

25.Regulation of TCA cycle. 5

26.Describe chemiosmotic theory of oxidative phosphorylation. 5

27. Describe the β-oxidation of a saturated fatty acid. 10

28. Fatty acid synthetase complex 5

29. Ketosis and ketoacidosis. 5

30. Describe the urea cycle in detail. 10

31.Describe the mechanism of transamination. 5

32. Describe non-oxidative deamination of amino acids. 5

33.What is Entropy ? 1

34.Define gluconeogenesis. 1

35.What is transmethylation ? 1

36.Chemiosmotic hypothesis was proposed by _____. 1

37. What is decarboxylation ? 1

38. Name the label used by Knoop in his experiments. 1

39.Why TCA cycle is amphibolic in nature ? 1

40.What is oxidative deamination ? 1

41. What is free energy ? 1

42.Name any one ketone body. 1

43. Fatty acid synthase complex can synthesize only _____ carbon saturated fatty acid. 1

44. Name one uncoupler of oxidative phosphorylation. 1

45.Describe glycolysis in detail. 10

46. Regulation of glycolysis 5

47. Gluconeogenesis. 5

48. Describe electron transport chain in detail. 10

49. Describe the structure of mitochondria. 5

50. Explain the regulation of TCA cycle. 5

51.Describe in detail the β-oxidation of a saturated fatty acid. 10

52. Describe the synthesis of unsaturated fatty acids. 5

53. Describe Ketoacidosis. 5

54. Describe in detail the pathways of pyrimidine biosynthesis. 10

55. Transmethylation 2½

56.Deamination 2½

57.Disorders of urea cycle 2½

58.Decarboxylation. 2½)

59. What is the difference between hexokinase and glucokinase ? 1

60. Name one high energy compound other than ATP. 1

61.What is meant by redox potential ? 1

62. Why TCA cycle is amphibolic in nature ? 1

63.What is meant by oxidative phosphorylation ? 1

64. What are cytochromes ? 1

65. Name two ketone bodies. 1

66. What is meant by omega oxidation ? 1

67. Name the components of fatty acid synthetase complex. 1

68.Name any one disorder of urea cycle. 1

69. Give the linkage point of urea cycle and TCA cycle. 1

70. What is meant by salvage pathway ? 1

DEPARTMENT OF BIOTECHNOLOGY

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BIOTECHNOLOGY

SEMESTER III

PAPER II : BIOPHYSICAL TECHNIQUES

1. Define and derive Beer's law. 2½M

2. Differentiate between colorimeter and spectrophotometer. 2½M

3. Draw a well labelled diagram of double beam spectrometer. 2M

4. Write a note on Monochromators used in UV-Visible spectrophotometry 2½M

5. Write short notes on Deviations from Beer's law. 2½M

6. Concept of auxochrome 2½M

7. Principle of dual-wavelength spectrophotometer. 2½M

8. Describe briefly Principle and applications of absorption flame photometry.05M

9. Mass Spectrometry 05M

10. Applications of UV-Visible spectrophotometry. 05M

11. Principle and instrumentation of emission flame photometry. 05M

12. Describe Thin layer chromatography. 10M

13. Describe Gel filtration chromatography. 10M

14. Describe Ion-exchange chromatography. 10M

15. Describe the elements of HPLC. 10M

16. Absorption spectrum and its uses 2½ M

17. Principle of dual-wavelength spectrophotometer. 2½M

18. Describe briefly Principle and applications of absorption flame photometry.05M

19. Mass Spectrometry 05M

20. Applications of UV-Visible spectrophotometry. 05M

21. Principle and instrumentation of emission flame photometry. 05M

22.Describe in detail the instrumentation of UV-visible spectrophotometer. 10

23.Define Beer's law. Give the derivation of Beer's law. 2½

24. Describe the concept of auxochromes and chromophores. 2½

25. Differentiate between colorimeter and spectrophotometer. 2½

26. Write a note on absorption spectrum.

27. Describe the principle of IR spectrometry. 5

28.Describe any three applications of UV-visible spectrophotometer. 5

29.Describe the principle and instrumentation of absorption flame-photometry. 5

30.Describe the instrumentation of spectrofluorometry. 5

31. Describe thin layer chromatography in detail. 10

32. Describe gel filtration chromatography in detail. 10

33. Describe different types of resins used in ion exchange chromatography. 5

34.Briefly describe HPLC. 5

35. Discuss the principle of ion exchange chromatography. 5

36.Give the applications of affinity chromatography. 5

37. Define extinction coefficient. 1

38. What is a monochromator ? 1

39. What is dual wavelength spectrophotometry ? 1

40. What is the role of nebulizer in emission flame-photometry ? 1

41.What is the source of radiation in IR spectrometer ? 1

42. Name the three main components of mass spectrometer. 1

43. What is partition coefficient ? 1

44. Define Rf value. 1

45.Which is the stationary phase in paper chromatography ? 1

46.What is a ligand ? 1

47. What is meant by elution in affinity chromatography ? 1

48. What is a cationic exchanger ? 1

49.Describe in detail the instrumentation of UV-visible spectrophotometer. 10

50.Define Beer's law. Give the derivation of Beer's law. 2½

51.Describe the concept of auxochromes and chromophores. 2½

52.Differentiate between colorimeter and spectrophotometer. 2½

53.Write a note on absorption spectrum.

54.Describe the principle of IR spectrometry. 5

55.Describe any three applications of UV-visible spectrophotometer. 5

56.Describe the principle and instrumentation of absorption flame-photometry. 5

57. Describe the instrumentation of spectrofluorometry. 5

58. Describe thin layer chromatography in detail. 10

59. Describe gel filtration chromatography in detail. 10

60. Describe different types of resins used in ion exchange chromatography. 5

61. Briefly describe HPLC. 5

62. Discuss the principle of ion exchange chromatography. 5

63. Give the applications of affinity chromatography. 5

64. Define extinction coefficient. 1

65. What is a monochromator ? 1

66. What is dual wavelength spectrophotometry ? 1

67. What is the role of nebulizer in emission flame-photometry ? 1

68. What is the source of radiation in IR spectrometer ? 1

69. Name the three main components of mass spectrometer. 1

70. What is partition coefficient ? 1

71. Define Rf value. 1

72. Which is the stationary phase in paper chromatography ? 1

73. What is a ligand ? 1

74.What is meant by elution in affinity chromatography ?

75.Describe in detail Column Gel Electrophoresis. 10

76.Describe in detail Paper Electrophoresis. 10

77.. Describe in detail Pulsed-Field gel electrophoresis. 10

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SEMESTER IV

PAPER I : IMMUNOLOGY

1.	Describe various cells of the Immune System.	10M
2.	Describe Active and Passive Immunity.	10 M
3.	Explain in detail, delayed type of Hypersensitivity.	10M
4.	Describe the detailed structure of IgG.	05M
5.	Describe NK Cell – mediated immune response.	05M
6.	Explain Type-III Hypersensitivity.	05M
7.	Describe general concept of Autoimmunity.	05M
8.	Describe Anaphylaxis Reaction.	05M
9.	Give an account of Live and Killed vaccines with example.	05M
10.	Write a note on Direct ELISA Test.	2½M

11. Write a short note on Heamagglutination Test. 2½M

12. Explain any one Precipitation Reaction with example. 2½M

13. Give applications of Monoclonal Antibodies. 2½M

14. Write a note on Indirect ELISA Test. 2½M

15. Write the principle of Complement Fixation Test. 2½M

16. Write a note on direct agglutination with example. 2½M

17. Describe the principle of hybridoma technology. 2½M

18. Describe the detailed structure of IgG. 05M

19. Describe NK Cell – mediated immune response. 05M

20. Explain Type-III Hypersensitivity. 05M

21. Describe various cells of the Immune System. 10

22. Describe Active and Passive Immunity. 10

23. Explain in detail, delayed type of Hypersensitivity. 10

24. Describe the detailed structure of IgG. 5

25. Describe NK Cell – mediated immune response. 5

26. Explain Type-III Hypersensitivity. 5

27. Describe general concept of Autoimmunity. 5

28. Describe Anaphylaxis Reaction. 5

29. Give an account of Live and Killed vaccines with example. 5

30. Write a note on Direct ELISA Test. 2½

31. Write a short note on Heamagglutination Test. 2½

32. Explain any one Precipitation Reaction with example. 2½

33. Give applications of Monoclonal Antibodies. 2½

34. Write a note on Indirect ELISA Test. 2½

35. Write the principle of Complement Fixation Test. 2½

36. Write a note on direct agglutination with example. 2½

37. Describe the principle of hybridoma technology. 2½

38. Solve any ten of the following

39. What is an Epitope ? 1

40. What is an Antigen ? 1

41. What is Hapten ? 1

42. What is the full form of ADCC ? 1

43. What is the full form of MHC ? 1

44. Give any one example of Cytokines. 1

45. Name any one Autoimmune disease. 1

46. Name the scientist who developed vaccine against small pox. 1

47. Name the cell involved in type IV hypersensitivity reactions. 1

48. What is immunodiagnosis ? 1

49. What is the full form of 'HAT' ? 1

50. Define monoclonal antibodies. 1

51. Discuss various secondary organs of the immune system. 10

52. Write notes on Classical pathway of complement system 5

53. Active immunity. 5

54. Describe the general structure and characteristics of Immunoglobulins. 10

55. Write notes on NK cells 5

56. MHC–I. 5 3.

57. Describe type I hypersensitivity. 10

58. Write notes on :

59. Significance of vaccination 5

60. Autoimmunity. 5

61. Describe hybridoma technology and its applications. 10

62. Write notes on : Direct ELISA 2½

63. Radial immunodiffusion 2½

64. Precipitation reaction 2½

65. Complement fixation test. 2½

66. Define epitope 1

67. Define autoantigens 1

68. What is a hapten ? 1

69. What is meant by ADCC ?1

70. Give an example of delayed hyper sensitivity reaction. 1

71. What are cytokines ? 1

72. What are edible vaccines ? 1

73. Give one example of recombinant vaccine. 1

74. What are killed vaccines ? 1

75. Give one difference between precipitation and agglutination reaction. 1

76. Name any one commonly used enzyme in ELISA. 1

77. What is antibody titre ? 1

78. Describe the Secondary lymphoid organs. 10

79. What is Acquired Immunity ? Describe active and passive immunity. 10

80. Draw a well labelled diagram of an immunoglobulin. Give the salient features of immunoglobulin molecule. Briefly describe functions of various immunoglobulins. 10

81. Write a note on delayed type of hypersensitivity. 5

82. Describe the mechanism of NK cell mediated immunity. 5

83. Give Gel and Coomb's classification of hypersensitivity.

84. Describe the anaphylaxis. 1

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BIOTECHNOLOGY

SEMESTER IV

PAPER II: BIOSTASTICS & BIOPHYSICAL TECHNIQUES

1. Describe in detail cellulose-acetate electrophoresis.	10M
2. Describe in detail slab gel electrophoresis.	10M
3. Describe the principle, procedure and applications of isoelectric focusing.	10M
4. Give a detailed explanation of pulsed-field gel electrophoresis.	10M
5. Write notes on Liquid scintillation counter.	05M
6. Ionization chamber.	05M
7. Discuss the principle of isotopic tracer technique in metabolic studies.	10M
8. Describe mean, mode and median with suitable examples.	10M
9. Write a detailed note on density gradient centrifugation.	10M

10. Describe the principle and process of High Voltage Electrophoresis (HVE) in detail. 10M

11. Describe Slab Gel Electrophoresis. 10M

12. Describe the process of isoelectric focusing. 05M

13. Explain the application of SDS-PAGE. 5 OR Explain in detail the Pulsed field gel electrophoresis. 10M

14. Explain the principle, instrumentation and procedure of Scintillation countin10M

15. Describe falling drop method for measurement of Deuterium. 10M

16. Describe the principle, procedure and applications of isoelectric focusing. 10M

17. Describe Slab Gel Electrophoresis. 10M

18. Give a detailed explanation of pulsed-field gel electrophoresis. 10M

19. Write notes on Liquid scintillation counter. 05M

20. Ionization chamber. 05M

21. Describe Slab Gel Electrophoresis. 10M

22. **Describe in detail cellulose-acetate electrophoresis. 10**

23. **Describe in detail slab gel electrophoresis. 10**

24. **Describe the principle, procedure and applications of isoelectric focussing. 1**

25. **Give a detailed explanation of pulsed-field gel electrophoresis. 10**

26. **Write notes on :**

27. **Liquid scintillation counter. 5**

28. **Ionization chamber. 5**

29. **Discuss the principle of isotopic tracer technique in metabolic studies. 10**

30. **Describe mean, mode and median with suitable examples. 10**

31. **Write a detailed note on density gradient centrifugation. 10**

32. **Name any one factor affecting electrophoretic mobility. 1**

33. **Name the tracking dye used in gel electrophoresis. 1**

34. **What is the role of TEMED in polyacrylamide gel preparation ? 1**

35. **What is the full form of SDS ? 1**

36. **Give any one application of SDS-PAGE. 1**

37. **What is meant by isoelectric pH ? 1**

38. **Define curie. 1**

39. **What is a negatron ? 1**

40. **What is dead time in GM counter ? 1**

41. **What is standard error ? 1**

42. **What is RCF ? 1**

43. **What is Svedberg unit ? 1**

44. **Describe the principle and process of High Voltage Electrophoresis (HVE) in detail. 10**

45. **Describe Slab Gel Electrophoresis. 10**

46. **Describe the process of isoelectric focussing. 5**

47. **Explain the application of SDS-PAGE. 5**

48. **Explain in detail the Pulsed field gel electrophoresis. 10**

49. **Explain the principle, instrumentation and procedure of Scintillation counting. 10**

50. **Describe in detail Mass Spectrometry. 5**

51. **Describe falling drop method for measurement of Deuterium. 5**

52. **Arithmetic Mean with example. 2½**

53. **Density gradient centrifugation. 2½**

54. **Standard Error. 2½**

55. **Ultracentrifuge. 2½**

56. **Standard Deviation. 2½**

57. **RCF. 2½**

58. **Mode with example. 2½**

59. **Differential Centrifugation. 2½**

60. **Name any one solubilizer used in gel electrophoresis. 1**

61. **Name the tracking dye used in electrophoresis. 1**

62. **What is the role of TEMED ? 1**

63. **What is the full form of APS ? 1**

64. **What is the role of stacking gel in electrophoresis ? 1**

65. **Write the components of polyacrylamide gel. 1**

66. **What is 'Curie' ? 1**

67. **Give one difference between stable and radioactive isotopes. 1**

68. **What is meant by autoradiography ? 1**

69. **Define Sedimentation coefficient. 1**

70. **What is a Clinical Centrifuge ? 1**

71. **Define Median.**

DEPARTMENT OF BIOTECHNOLOGY

Question bank

BIOTECHNOLOGY

SEMESTER V

PAPER I: Molecular Biology

1. Discuss the experiment that led to the understanding that DNA replication is semi conservative. 10M
2. Write a brief note on rolling circle model of replication. 05M
3. Discuss the termination process of DNA replication. 05M
4. Briefly discuss lac operon. 05M
5. Ames' Test and (ii) Types of DNA damage. 10M
6. Write a note on DNA Polymerase I. 05M
7. Briefly discuss SOS repair. 5 3. Enumerating the four phases of transcription, describe the initiation phase in detail. 10M
8. Write a note on the conserved features of the promoter. 05M
9. Write a note on intrinsic transcription termination. 05M
10. In detail discuss the structure and working of the lac operon. 10M

11. Write a note on reverse trascription. 05M

12. Giving the structure of trp operon, discuss its negative control. 05M

13. Name types of DNA polymerases in prokayotes. 01M

14. What is the role of "tus" proteins in replication? 01M

15. What do you mean by "priming" in DNA replication? 01M

16.Describe in detail the initiation process of replication in prokaryotes. 10

17.Write a note on proof for semiconservative replication. 5

18.Describe DNA polymerase III holoenzyme. 5

19.Discuss in detail type of gene mutation. 10

20.What are mutagens ? Discuss chemical mutagens. 5

21.Give an account on Nucleotide Excision Repair. 5

22.Write a note on abortive initiation. 2½

23.Give the structure and significance of prokaryotic promoter. 2½

24.Write a note on chain elongation. 2½

25.Write a note on σ factor. 2½

26.Describe the initiation process of prokaryotic transcription. 10

27.Describe lac operon in detail. 10

28. Describe the role of CRP and cAMP in lac operon. 5

29. Describe the role of attenuator in trp operon. 5

30.Name the protein which is associated with DNA-B helicase.

31. What is the role of topoisomerases in DNA replication ?

32. 53 '→' activity of DNA polymerase is also called as _____ activity..

33. Name any one type of physical mutagen.

34. What is meant by 'AP' in AP endonuclease ?

35. Name the most common type of DNA damage caused by UV radiations.

36. Name the subunit composition of prokaryotic RNA polymerase core enzyme.

37. Write the concensus sequence of pribnon box.

38.What is the role of Nus A ?

39.What is meant by gratuitous inducer ?

40. What is the role of operator in operon ?

41. Name the enzymes involved in lactase metabolism. 1×

42.Describe the important properties of DNA polymerase I. 10

43. Describe in detail the semiconservative nature of replication. 5

44. Write a note on helicase and topoisomerase. 5

45.Give the detailed account of mutagens and explain mechanism of action. 10

46. Explain the mechanism of Mismatch Repair. 5

47. Describe mis-sense and non-sense mutation. 5

48. Explain the concept of promoter. 2½

49.Give the significance of sigma factor. 2½

50. Give the structure and functions of prokaryotic RNA polymerase. 2½

51.Write a note on promotor escape. 2½

52. Explain rho dependent termination. 2½

53.Diagramatically represent the transcription process. 2½

54.Write a note on prokaryotic RNA polymerase. 2½

55.Describe the role of –10, –35 sequence in transcription process. 2½

56. Diagramatically explain the trp operon. 5

57. Explain the process of reverse transcription. 5

58. Describe the intrinsic termination of transcription with suitable diagrams. 5

59. Explain the positive control of lac operon. 5

60.Write the role of primase in replication. 1

61.What are okazaki fregments ? 1

62.Write the function of Dna C protein in helicase. 1

63.Which enzyme is responsible for SOS repair ? 1

64.What is frame shift mutation ? 1

65.What is photoreactivation ? 1

66. What is rho)(ρ factor ? 1

67. What is the role of Nus A in transcription ? 1

68.What is the difference between RNA polymerase core enzyme and holo enzyme ? 1

69.What is operon ? 1

70.What is the primer used in reverse transcription ? 1

71.What is the main characteristic of intrinsic transcription termination ? 1

72.Describe semi conservative replication of DNA. 5

73.Write a note on helicase and topoisomerase.

74.Discuss the role of DNA polymerase I, II, III in DNA

75.replication. 10

76.Give detail account of physical and chemical mutagens.

77. Mismatch repair. 5

78.Light induced repair. 5

79.Explain the role of prokaryotic RNA polymerase. 5

80.Explain promoter binding and activation. 5

81.Describe the role of -10, -35 sequence in

82.transcription process. 5

83.Explain rho dependent termination. 5

84.Describe Lac operon in detail. 10

85.Reverse transcription. 5

86.Intrinsic termination of transcription. 5

87.What is the role of beta subunit in replication.

88.Who proposed concept of Okazaki fragments ?

89.What is the direction of movement of DNA B

90.helicase on DNA ?

91.What is meant by frame shift mutation ?

92. What is meant by NER ?

93.What is meant by SOS repair ?

94.What is role of Nus A ?

95.What is meant by "70" in sigma 70 ?

96. What is the difference between RNA polymerase

97.core enzyme and holoenzyme ?

98. What is the primer used in reverse transcription ?

99. What is meant by attenuation ?

100. What is meant by gratuitous inducers ?

DEPARTMENT OF BIOTECHNOLOGY

Question bank

BIOTECHNOLOGY

SEMESTER V

PAPER II: Molecular Biology & rDNA Technology

1. Describe in detail the attachment of amino acids to tRNA. 10M
2. Describe in detail how the genetic code was deciphered. 10M
3. Describe the initiation process of prokaryotic protein biosynthesis. 10M
4. Describe the role of release factors in prokaryotic translation. 05M
5. Describe the role of antibiotics affecting translation process. 05M
6. Describe the technique of transformation and transfection. Add a note on selection of transformed cells. 10M
7. Describe briefly the PUC series of vectors. 05M
8. Describe briefly the restriction endonucleases. 05M
9. Describe in detail the applications of rDNA technology in medicine and agriculture. 10M
10. Write short notes on Expression vectors. 2½M
11. Primer designing.2½M
12. cDNA library. 2½M

13. Steps in PCR technique. 2½M

14. Name any one rDNA product used in the field of medicine.10M

15. Why two primers which are 90% complimentary to each other cannot be used as primers in the PCR technique? Give any one reason.10M

16.Describe in detail the attachment of amino acids to tRNA. 10

17.Describe in detail how the genetic code was deciphered. 10

18. Describe the initiation process of prokaryotic protein biosynthesis. 10

19. Describe the role of release factors in prokaryotic translation. 5

20. Describe the role of antibiotics affecting translation process. 5

21. Describe the technique of transformation and transfection. Add a note on selection of transformed cells. 10

22. Describe briefly the PUC series of vectors. 5

23. Describe briefly the restriction endonucleases. 5

24.Describe in detail the applications of rDNA technology in medicine and agriculture. 10

25.Write short notes on :

26. Expression vectors 2½

27. Primer designing 2½

28. cDNA library 2½

29. Steps in PCR technique 2½

30. To which end of tRNA, the amino acid is attached ?

31.Who proposed Wobble hypothesis ?

32. Give any one role of Shine-Dalgarno sequence.

33. Name any one elongation factors used in protein biosynthesis.

34.Name the factor which separates the large and small subunit of Ribosomes

35. What is meant by autogenous control ?

36.What is meant by PBR322 ?

37.What is meant by "EcoRI" ?

38.Name the enzyme efficient in blunt-end ligation.

39. Give any one advantage of cDNA library over genomic library.

40. Name any one rDNA product used in the field of medicine.

41. Why two primers which are 90% complimentary to each other cannot be used as primers in

42.the PCR technique ? Give any one reason. 1×10=10

43.Describe in detail the amino acyl synthetases and activation of amino acids. 10

44.Write a note on Wobble Hypothesis. 5

45.Describe the structure of tRNA. 5

46.Describe the process of initiation of Prokaryotic Translation. 10

47. Explain autogenous control of r-proteins. 5

48. Describe the termination of translation in prokaryotes. 5

49.Give detail account of cohesive and blunt end ligation. 10

50.Describe pBR322 vector. 5

51.Describe cosmid vector. 5

52.Describe concept and method of creating the genomic DNA library. Give its advantages and disadvantages. 10

53. Describe applications of rDNA technology. 5

54.Describe general features of PCR. 5

55. Write the sequence of any one stop codon.1

56. What is meant by degeneracy of genetic code ?1

57. Name the scientist who proposed Wobble Hypothesis1.

58.Name any one prokaryotic elongation factor.1

59.Name the prokaryotic ribosomal subunits required for initiation of protein synthesis.1

60. Name any one antibiotic affecting translation process.

61.What is meant by 'pUC' in pUC vectors ?1

62. What is the difference between transformation and transfection ?1

63.Why cosmids are so called ?1

64.Name the scientist who developed PCR technique.1

65. What is Tm in PCR ?1

66.Name any one medicine developed by rDNA technology.1

67.Describe various characteristic properties of genetic code. 10

68. Draw the structure of t-RNA. 2½

69. Shine-Dalgarno sequence. 2½

70. Wobble-hypothesis. 2½

71. Role of 16S rRNA in selection of initiation codon. 2½

72.Explain in detail about initiation of protein synthesis. 10

73.Translation Elongation. 2½

74.Antibiotics affecting translation. 2½

75.Autogenous control of r-protein. 2½

76. P32 translation regulation. 2½

77.Restriction endonucleases. 2½

78.Lambda replacement vectors. 2½

79. Selection of transformed cells. 2½

80. Cosmid. 2½

81.Describe DNA manipulating enzymes. 10

82.Explain in detail polymerase chain reaction. 10

83. Advantages and disadvantages of cDNA library over genomic DNA library. 2½

84.Designing of primer. 2½

85. Applications of rDNA Technology. 2½

86.Expression vector. 2½

87. Give the initiation codon present in prokaryotes. 1

88. Who proposed Wobble hypothesis ? 1

89. Name the first codon deciphered. 1

90.Name the proteins involved in termination of protein synthesis. 1

91.Puromycin blocks which site in the ribosome ? 1

92. Name the enzyme which attaches an amino acid to the tRNA. 1

93. Name the types of restriction endonucleases. 1

94.What is meant by PUC ? 1

95.Name the popular enzyme used in ligation of two DNA. 1

96.Who invented PCR ? 1

97.What is the role of reverse transcriptase in cDNA library ? 1

98.Name any one rDNA product having application in medicine. 1

DEPARTMENT OF BIOTECHNOLOGY

Question bank

BIOTECHNOLOGY

SEMESTER VI

PAPER I: Application of Biotechnology

1. Describe methods of chlorination in detail. 10M
2. Write notes on Concept of Biodegradation.10M
3. Activated sludge treatment. 05M
4. Describe the principle and mechanism of IMVic Test. 10M
5. Write notes on MPN. 05M
6. Write notes on BOD.05M
7. Explain various parts of a fermentor.10M
8. Write notes on Crowded plate technique. 05M
9. Important features of secondary screening of industrially important microorganisms. 10M
10. Explain in detail production of edible mushroom. 10M
11. What is mean by GMO. 01M
12. Types of cheese. 05M
13. Quality assurance in pharmaceutical industry. 10M

14. Mention any one good manufacturing practice in Pharmaceutical industry. 10M

15. What is meant by ripening of cheese? 10M

16. Describe the composition and preparation of PTC media. 10

17. Laboratory facilities required for a plant tissue culture. 5

18. Initiation and maintenance of suspension culture. 5

19. Write short notes on :

20. Protoplast culture 5

21. Applications of transgenic plants. 5

22. Discuss the techniques of micropropagation and its applications. 10

23. Primary culture 5

24. Growth factors required for cell culture. 5

25. Describe the maintenance of cell lines in laboratory. 10

26. Describe in short on :

27. Insulin — a product of rDNA technology 5

28. Transgenic animals. 5

29. Production of hepatitis vaccine 5

30. Gene therapy. 5

31. Define callus

32. What is single cell clone ?

33. Name any one phytohormone.

34. What is Ti plasmid ?

35.Give full form of PEG.

36. Name the gene of Bacillus thuriengensis used in Bt-cotton.

37. What is Hayflick's limit ?

38.What are trophic factors ?

39. What is CAM ?

40.Give the role of somatostatin.

41. Name any one transgenic animal.

42. What is meant by in-vitro fertilization ?

43.Describe methods of chorination in detail. 10

44. Concept of Biodegradation 5

45. Activated sludge treatment. 5

46.Describe the principle and mechanism of IMVic Test. 10

47.MPN 5

48.BOD. 5

49. Explain various parts of a fermentor. 10

50. Crowded plate technique 5

51. Important features of secondary screening of industrially important microorganisms. 5

52. Explain in detail production of edible mushroom. 10

53. Types of cheese 5

54. Quality assurance in pharmaceutical industry. 5

55.Define biotransformation 1

56. What is ozonation ? 1

57. Name a biogas formed in an anaerobic digester. 1

58. What are recalcitrant compounds ? 1

59. Define Xenobiotics. 1

60. Define biomagnification. 1

61. What is meant by GMO ? 1

62. Name any one pharmaceutical product produced by GMO's. 1

63. What is meant by antifoaming agents ? 1

64. Name any one example of SCP. 1

65. Mention any one good manufacturing practice in Pharmaceutical industry. 1

66. What is meant by ripening of cheese ? 1

DEPARTMENT OF BIOTECHNOLOGY

Question bank

BIOTECHNOLOGY

SEMESTER V

PAPER II: Plant & Animal Biotechnology

1. Describe the composition and preparation of PTC media. 10M

2. Write on Laboratory facilities required for a plant tissue culture. 05M

3. Initiation and maintenance of suspension culture. 05M

4. Write short notes on Protoplast culture. 05M

5. Applications of transgenic plants. 05M

6. Discuss the techniques of micropropagation and its applications 10M

7. Write notes on Primary culture05M

8. Growth factors required for cell culture.05M

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