Rayat Shikshan Sanstha's

Yashavantrao Chavan Institute of Science, Satara (Autonomous)

Department of Biotechnology

B. Sc. I (Semester-II) Examination Biotechnology (Entire)

Question Bank

Chemistry (BBTT-201)

Answer the following questions **2 Marks**

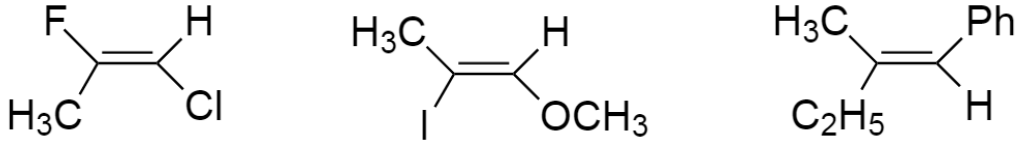
1) Explain in short SN^2 reaction.
2) Explain in short SN^1 reaction.
3) Explain Markovnikoff rule.
4) Explain carbanion formation in compounds.
5) Mention different types of reagents.
6) What are different reactive intermediates?
7) Define nucleophile.
8) Define electrophile.
9) Mention Saytzeff's rule.
10) What is nitration of benzene?
11) Explain Chirality with suitable example.
12) Explain geometrical isomerism.
13) What is plane polarized light.
14) Give chiral carbon with example.
15) Explain diastereomers.
16) Explain enantiomers.
17) Alpha particle disintegration.
18) Give different radioactivity detectors.
19) Define radioactivity with suitable example.
20) Draw neat and labeled gas detector.
21) Define radioactivity with suitable example
22) Draw neat and labeled photomultiplier tube.
23) Applications of nanoparticles.
24) Explain with suitable diagram Geiger Muller counter for radioactivity detection.
25) Explain with suitable diagram scintillation counter for Radioactivity detection.
26) Explain nuclear stability with the help of neutron to proton ratio.
27) What is Terpenoids?

28) Give structure of citral.
29) What is function of carotenoids in plant.
30) Give name and structure of two alkanoids.

Answer the following questions **10 Marks**

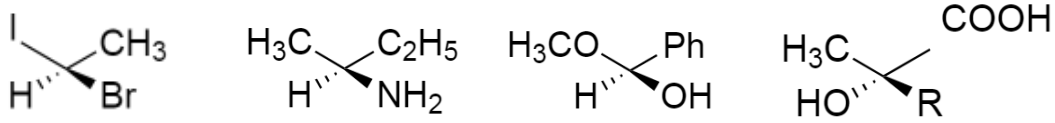
1) With the help of suitable reaction, explain carbocataion and carbanion.
2) With the help of SN^2 mechanism explain hydrolysis of primary alkyl halide.
3) What is hydrolysis of primary alkyl halide? Explain it with suitable energy profile diagram.
4) With the help of SN^1 mechanism explain hydrolysis of tertiary butyl halide.
5) With the help of electrophilic addition of alkenes explain in detail Markovnikoff's rule.
6) What is geometrical isomerism in alkenes? Assign the E & Z conformations for following.

(i) (ii) (iii)



7) What is geometrical isomerism in alkenes? assign the following R and S structures.

(i) (ii) (iii) (iv)



8) What is plane polarized light? With the help of suitable example explain the optical activity.
9) Explain nuclear stability with the help of neutron to proton ratio.
10) Explain with suitable diagram scintillation counter for Radioactivity detection.
11) Explain with suitable diagram Geiger Muller counter for radioactivity detection.
12) With the help of suitable diagram explain photomultiplier tube with its applications and drawbacks.

13) Mention different biological applications radioisotopes; Explain in detail carbon dating process.
14) What are the different steps to follow for determining the structure of citral?
15) What is isoprene rule? Explain Terpenoids with the help of citral.

Answer the following questions **5 Marks**

1) With suitable example explain nitration of benzene.
2) Write a note on electrophilic addition reactions in alkenes.
3) Write a note on SN^1 reaction mechanism.
4) Write a note on SN^2 reaction mechanism.
5) Short note on different types of reagents.
6) Write a note on carbocation.
7) Write a note on Markovnikoff's rule.
8) Explain nitration of benzene with the help of suitable example.
9) Write a short note on diastereomers.
10) Mention different types of geometrical isomerism in alkenes.
11) Write a note on optical activity.
12) With the help of suitable example explain chirality of carbon.
13) Write a note on plane polarized light.
14) With the help of suitable examples mention R-S nomenclature system.
15) Write a note on enantiomers.
16) With suitable diagram explain gas detector.
17) Give difference between alpha and beta particles.
18) Write a note on neutron to proton ratio.
19) Short note on photomultiplier tube.
20) What are the different properties of gamma particles.
21) What are the different applications of nanomaterials.
22) Mention some properties of alpha particles.
23) Mention different applications of nanomaterials.
24) Write a note on carbon dating process.
25) Explain carotenoids and their functions in plants.
26) With the help of structure explain Alkanoids.
27) Write a note on Terpenoids.
28) Give the structure of citral.
29) Write a note on carotenoids.

30) Write a note on Alkanoids.

BBTT 202 PROTEINS AND ENZYMES

Q.1 Define following terms.

1. Define Peptide bond formation.
2. Define Enzymes.
3. What are prosthetic groups?
4. Define Sonication.
5. What is Dialysis?
6. What is Titration curve of amino acid?
7. What are Michaelis and Menten constant?
8. Define Stereo specificity.
9. Define Salting out.
10. Define RDA.
11. Define Zwitterion.
12. Define Coenzyme and cofactor.
13. Define Energy of activation.
14. What is Ammonium salt precipitation?
15. Define Isoelectric pH
16. Define Protein.
17. Define Amino Acid.
18. Define Active site.
19. Define Vitamin.
20. Define Cell Disruption.
21. Define Non competitive Inhibition.
22. Define competitive Inhibition.

23. Define Reversible Inhibition.
24. Define Irreversible Inhibition.
25. Define Enzyme Kinetics.
26. Define Inhibitor.
27. Define Zymogens.
28. Define Transition State

Q.2 Attempt any two of the following.

1. What is enzyme inhibition? Give its types.
2. Define Vitamin and describe in detail about structure, daily requirement, source, biological role and deficiency of Vitamin $B_{12.}$
3. What is cell disruption? Explain in detail enzymatic and physical cell disruption.
4. What is amino acid? Explain classification of 20 different amino acid with structure.
5. Explain in detail IUB classification of enzymes.
6. Define cell disruption? Explain physical, chemical and mechanical methods of cell disruption.
7. Define protein? Describe Quaternary structure of protein with respect to Haemoglobin.
8. What is active site? Discuss hypothesis for the formation of E-S complex in enzyme
9. Explain in detail information about Vitamin $B_{1.}$
10. What is protein? Describe structural level classification of protein
11. What are enzymes? Explain its IUB classification.
12. Define Vitamin and describe in detail about structure, daily requirement, source, biological role and deficiency of Cynocobalamin.

13. What is denaturation of proteins? Discuss agents of denaturation and characteristics of denaturation
14. Define protein? Describe Quaternary structure of protein with respect to Heamoglobin.
15. Describe in detail different types of enzyme inhibition.
16. Give the detail information about Vitamin $B_{2.}$
17. Describe in detail classification of enzymes with sutaible examples.
18. Define cell disruption? Explain verious methods of cell disruption.
19. Describe in detail history, structure, daily requirement, source, biochemical function and deficiency of Vitamin Niacin.

Q.3 Attempt any four of the following

1. Write a note on Ramchandran plot.
2. Write a note on basic amino acids with their structure.
3. Write a note on transition state hypothesis.
4. Write a note on types of proteins.
5. Describe Salting in.
6. Write a note on Salting Out.
7. Explain Biological importance of Folic acid.
8. Write a note on lock and key model for enzyme action.
9. Explain Biological function and deficiency of Cynocobalmin (Vitamin B_{12})
10. Write a note on Dialysis.
11. Write a note on secondary structure of Protein.
12. Describe Peptide bond.
13. Explain Structure, chemistry, biological role of Biotin (B_7).

14. Write a note on Ultrafiltration.
15. Describe Tertiary structure of protein.
16. Explain Induced fit hypothesis.
17. Explain Biological function and deficiency of pantothenic acid.
18. Give Structure, chemistry, biological role of Niacin (vitamin $B_{3)}$.
19. Biological function and dificiency of pyridoxal phosphate
20. Write a note on Induced fit hypothesis.
21. Write a note on Active site.
22. Describe Sructure, chemistry ,biological role of riboflavin
23. Write a note on Ultrafiltration
24. Describe Forces stabilizing secondary structure
25. Write a note on Lock and key hypothesis.
26. Write a note on Biological function and deficiency of Lipoic acid
27. Write a note on Structure, chemistry, biological role of Thiamine.
28. Describe the terms Zwitterion ,Isoelectric point of amino acid and Discuss titration curve of amino acid.
29. Describe Biological importance of Ascorbic acid.
30. Write down the structure of any five amino acids and name them.
31. Write a note on M-M equation.
32. Write a note on types of proteins.
33. Discuss competitive and non-competitive inhibition of enzyme

B.Sc. Part I (SEM -II) End semester examination,
BIOTECHNOLOGY (ENTIRE)
Animal Science (BBTT-203)
Subject code: - 30013

Q.1 Define the following terms (25) (2Marks Each)

1. Host
2. Mollusca
3. Tissue
4. Apiculture
5. Pisciculture
6. Parasite
7. Echinodermata
8. Sericulture
9. Histology
10. Hermaphrodite
11. Digenic life cycle
12. Amphibia
13. Vermiculture
14. Histology
15. Internal fertilization
16. Taxonomy
17. Kingdom
18. Protozoan
19. Digenetic life cycle
20. Adaptations
21. Tissue
22. Corpuscles
23. Apiculture
24. Blood plasma
25. Marine Fisheries.

Q. 2 Long answer questions (15) [10Marks each]

1. Write the general characteristic of phylum porifera with reference to sycon.
2. Write an essay on Plasmodium.
3. Write a essay on life cycle of Bombax mori.
4. Write the general characteristic of phylum mollusca with reference to Pila .
5. Write an essay on Liver fluke.
6. Write a essay on life cycle of Bombyx mori.
7. Write the general characteristic of phylum Echinodermata with reference to starfish .
8. Write an essay on Ascaris.
9. Write a essay on life cycle of Bombyx mori.
10. Write the general characteristic of phylum arthropoda with reference to cockroach
11. Write the general characteristic of pisces with reference to Lebeo rohita
12. Write the general characteristic of Amhibia with reference to Frog.
13. Define tissue with refereance to Mascular tissue.
14. Write an essay on issciculture
15. Write an essay on histology of Skin and uterus.

Q. 3 Short answer questions (30) [5Marks each]

1. Explain the composition of human blood in detail.
2. Histology of Uterus .
3. Genaral characteristic and only names of classes in phylum Ceolentarata.
4. Characteristics of Host and Parasites.
5. Note on types of Honey bees.
6. Describe Nervous tissue.
7. Explain blood as a connective tissue in detail.
8. Histology of skin .
9. General characteristic and only names of classes in phylum Arthropoda .
10. Characteristics of Host and Parasites.
11. Note on types of silkworms.
12. Describe Muscular tissue.
13. Types of Human blood cells..
14. Structural characteristics of Uterus.
15. General characteristic and example of of class Mammalia.
16. Characteristics of Host and Parasites.
17. Note on Economic importance of Pisciculture .
18. General characteristic of class reptiles.
19. Write a note on Bone .
20. Write a note on Cartilage
21. Write a note on Serum and plasma
22. Note on Nervous tissue
23. Economic importance sericulture
24. Write a note on Apiculture
25. Write a Note on Amphibia.

26. Write a Note on Mammalia with eg.
27. Write a Note on Reptiles.
28. Write a Note on locomotion in hydra.
29. General characteristics of Class Pisces.
30. Inland fishery.

Physics - II (BBTT 204)
Sub Code: 30014

Define following Terms

1) Diffraction
2) LASER
3) Fill factor
4) NOR gate
5) Plane polarized light,
6) Chromatic aberration
7) Nernst equation
8) AND gate
9) Electrocardiogram
10) Normal Zeeman effect
11) Polarization
12) Optical activity
13) Huygen's eyepiece
14) Binary and BCD number system
15) NOT gate
16) LASER
17) Conduction velocity
18) Huygen's eyepiece
19) NAND gate
20) Refraction

Short Answer

1) Describe production of polarized light by absorption
2) Write note on Half adder and full adder
3) What do you mean by working efficiency and fill factor in solar cell
4) What is mean by Electroencephalogram(EEG)
5) Explain Concept of interference and diffraction
6) Write a note on spectral distribution of solar energy
7) Explain Rutherford atomic model and Bohr model in brief
8) Write down the properties of LASER
9) What is mean by Chromatic aberration
10) Write a note on Universal gates
11) Explain the Demorgans theorem
12) Write a note on Chromatic aberration
13) Write down the Applications of X-rays
14) Describe the phenomenon of polarization by double refraction

15) Explain the term R-S flip flop.
16) Write a note on Brags law.
17) What is meant by Eye piece? Explain its types.
18) What are the applications of Solar cell
19) Explain the terms Chromatic aberration.
20) Explain the term Spectral distribution of Solar cell
21) Describe Binary and BCD system
22) Explian Bohr's atomic model with figure
23) Explain J.J. Thomson Model in brief.
24) What is EMG?

Long Answer

1) Explain production of X-rays and describes its properties
2) Derive an expression for Nicol prism
3) Explain the Huygens double refraction through uniaxial crystals
4) Describe the Basic Logic gates? Explain Demorgans theorem
5) Explain steps involved in LASER action with Energy level diagram
6) Explain the Ruby Laser. Write down properties of LASER.
7) Explain construction and working of Solar cell.
8) Explain the term Polarization of light. Describe Nicol's Prism
9) Explain construction and working of Ruby Laser.
10) Describe Liquid drop model ans Shell model in detail
11) Explain Mosley's experimental work with neat labeled diagram.
12) Explain electricity observed in living organism with examples.
13) Describe energy level diagram of Hydrogen atom.
14) Explain origin of compound action potential.

BBTT 205 Bioinstrumentation II

Q. Define

1. Xray crystallography
2. Miller indices
3. crystal
4. UV visible spectroscopy
5. Electromagnetic radiation
6. Colorimeter
7. IR spectroscopy
8. Vibration spectra
9. Bandwidth
10. Hallow cathode lamp
11. Spectrum
12. Atomic absorption spectroscopy
13. Electron spin resonance spectroscopy
14. Nuclear magnetic resonance
15. Spin spin coupling
16. Mass spectroscopy
17. Lattice
18. Chemical shifting
19. Hyperfine shifting
20. Monochromator
21. Electronic transition
22. Photomultiplier tubes
23. Miller indices
24. Rotating crystal method
25. Detector

Q. Long answer question:

1. Explain different methods for determination of crystal structures.
2. Explain the Theory, Principle and Applications Mass Spectroscopy
3. Explain the principle, instrumentation and applications of UV Spectrometer..
4. Explain the principle, instrumentation and applications of Atomic absorption spectroscopy.
5. Explain the principle, instrumentation and applications of NMR spectroscopy.
6. Explain the Theory, Principle and Applications IR Spectrometer.
7. Explain Bragg's law with equation.
8. Explain the principle, instrumentation and applications of Laue method of crystal structure determination.

9. Explain principle , working of Rotating crystal method of crystal determination.
10. What is chemical shiffiting? Explain principle and instrumentation of nuclear Magnetic Resonance spectroscopy.
11. Explain different types of crystals.
12. Explain the Theory, Principle and Applications Colorimeter.
13. Explain principle, working and instrumentation with respect to spectroscopy.
14. Explain the Theory, Principle and working of x-ray crystallography.
15. Explain characteristics of electromagnetic radiation. Give short note on diagnostic application of spectroscopy.

Q. Short notes:

1. Explain Instrumentation of atomic absorption spectroscopy
2. Explain Beer's law
3. Give the application of UV visible spectroscopy
4. Bragg's law of diffraction.
5. Hyperfine splitting
6. Write the properties of electromagnetic spectrum.
7. Explain Lambert's law.
8. Write the instrumentation of Colorimeter.
9. Explain principle of electron spin resonance spectroscopy.
10. Types of crystal structures.
11. Applications of AAS
12. Instrumentation of ESR.
13. Explain principle and Instrumentation of colorimeter.
14. Write the properties of electromagnetic spectrum.
15. Write a note on vibration spectra.
16. Chemical Shift
17. application mass spectroscopy
18. Principles of NMR spectroscopy
19. Explain hyperfine splitting.
20. Applications of Laue method.
21. Explain lattice with equation
22. Explain electromagnetic spectrum.
23. Principle of colorimeter.
24. Explain Application spectroscopy.
25. Explain instrumentation of mass spectroscopy
26. Principle of IR spectroscopy.
27. Principle of Atomic absorption spectroscopy.

28. Application X-ray crystallography.
29.Explain characteristics of electromagnetic radiations.
30.Explain Rotating crystal method.

B.Sc. Part I (SEM -II)
BIOTECHNOLOGY (ENTIRE)
Basics in Microbiology-II (BBTT- 206)

Q.1. 2 marks question

1. Culture media
2. Growth curve
3. Water Microbiology
4. Parasite
5. Infection
6. Pure culture
7. Generation time
8. Soil Microbiology
9. Host
10. Pathogen
11. Peptone
12. Growth kinetics
13. Soil Microbiology
14. Opportunistic pathogen
15. Virulence
16. Living Media
17. Nonliving media
18. Growth rate
19. specific growth rate
20. Symbiosis
21. Commensalism
22. Amensalism
23. Saprophytes
24. Disease

25. Prophylaxis

Q.2. 10 mark question

1. Describe in detail common components of media? And short note on their function
2. Explain in detail phases of growth curve
3. Describe in detail production of endotoxin and exotoxin
4. Describe in detail methods for isolation of pure culture.
5. Explain detail effect of environmental factors on growth
6. Write a short note on types of infection
7. Describe in detail methods for isolation of pure culture.
8. Write a note Microbial interaction in soil.
9. Write a short note on types of diseases
10. What is generation time? Enlist different phases of Growth.
11. Write a short note on Production of endotoxin?
12. Describe in detail Mode of transmission of disease
13. What is MPN technique and describe procedure?
14. Write a note on Common components of media and their functions?
15. Explain in detail effect of environmental factors on growth?

Q. 4 marks question.

1. SPC test for coliform
2. Microbes as Biofertilizers eg. Nitrogen fixation
3. Escaping of phagocytosis
4. Spread plate method
5. SPC test for coliform qualitative detetction
6. Biocontrol agents of *Bacillus thuringenesis*
7. General principles of prevention and their control of microbial diseases
8. Spread plate method
9. Streak plate method
10. Airborne transmission

11.Biocontrol agents of *Bacillus thuringenesis*

12.Phases of growth curve

13. Write short note on continuous culture

14.Write short note on synchronous growth

15.Synthetic media

16.Semisynthetic media

17.Differential media

18.Selective media

19.Synchronous growth

20.Diauxic growth

21.Nitrogen fixers

22.Phosphate Solubilizers

23.Contact transmissions

24.Control of microbial diseases

25..Types of diseases: Epidemic,

26.Types of diseases: Endemic,

27.Types of diseases: Pandemic,

28.Types of diseases: Sporadic

29.Escaping of phagocytosis

30.Types of infections: Chronic

B.Sc. Part I (SEM -II)
BIOTECHNOLOGY (ENTIRE)
Computer Basics (BBTT- 208)

Define the term Keywords.

1. What is mean by Algorithm?
2. Define the term Constants.
3. What is the use of if…else statement?
4. How to declare array in C?
5. What is mean by Flowchart?
6. Define the term Identifiers.
7. What is mean by array?
8. What is the syntax of for loop?
9. Which arithmetic operators are used in C?
10. What is mean by Variable?
11. How to declare array in C?
12. Which relational operators are used in C?
13. What is the use of switch statement?
14. How to declare a variable in C?
15. How to define and initialize constants?
16. What is the syntax of while loop?
17. What are the types of relational operators?
18. What are the types of logical operators?
19. What are the types of arrays?
20. Write any two applications of C.
21. How to initialize a variable in C?
22. Write syntax of switch statement.

23. Write syntax of do while loop.

24. What is one dimensional array?

Long Answer Questions.

1) Explain Flowcharts with example.

2) What is mean by operators? Explain any two operators in detail.

3) Explain any two types of conditional statements with example.

4) Explain any two types of looping statements with example.

5) Explain Algorithms in detail.

6) Explain logical and relational operators.

7) What is mean by array? Explain with types.

8) Explain Data types in C in detail.

9) Explain for and while loop with example.

10) Explain if else and switch statement.

11) Explain C input output statements.

12) Explain characteristics of C.

13) Explain one and two dimensional arrays with example.

14) Explain arithmetic and logical operators.

15) Explain if else and switch statement.

Short Answer Questions.

1) What is mean by identifiers? What are the rules for constructing identifiers?

2) Explain for loop with one example.

3) Write an algorithm for Multiplication of two numbers.

4) Write a short note on Character set in C.

5) Write a C program to print addition of two numbers.

6) Explain any two input output statements with examples.

7) Explain while loop with one example.

8) Draw a flowchart for checking given number is even or odd.

9) Explain switch statement with example.

10) Explain any two input output statements with example.

11) Write a short note on one dimensional array.

12) Write a C program to print addition of two numbers.

13) Explain do while loop with one example.

14) Write a short note on Constants in C.

15) Write a C program to print addition of two numbers.

16) Write an algorithm for checking given number is even or odd.

17) What is mean by identifiers? What are the rules for constructing identifiers?

18) Write a short note on two dimensional arrays.

19) Write a C program to check if the given number is even or odd.

20) Explain if else statement with one example.

21) Write a C program to print multiplication of two numbers.

22) Explain if statement with syntax and example.

23) Write a short note on keywords in C.

24) Write an algorithm for division of two numbers.

25) Explain relational operators in C.

26) Explain logical operators in C.

27) Explain arithmetic operators in C.

28) Draw a flowchart for addition of two numbers.

29) How to create arrays? Explain with example.

30) How to declare and initialize variables? Explain