Roll No. ☐☐☐☐☐☐☐☐☐☐☐

Total No. of Questions : 09

B.Sc. Hons. (Microbiology) (Sem.–1)

CHEMISTRY-I

Subject Code : BSMB103-19

M.Code : 78981

Date of Examination : 17-05-2023

Max. Marks : 60

Time : 3 Hrs.

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Define Atom and Molecule.

   b) Significance of wave function.

   c) Inductive Effect.

   d) Enantiomers with examples.

   e) Dipole moment.

   f) Flying wedge projection formula.

   g) Meso compounds using suitable examples

   h) Erythro and Threo nomenclature.

   i) Define racemic resolution.

   j) Centre of symmetry.

SECTION-B

2. What are isomers? Give its types using suitable examples.

3. Discuss Bhor's Atomic model along with its merits and demerits.

4. Comment on IUPAC system of nomenclature using suitable examples.

5. What is racemic modification? Give methods for performing racemic modifications.

6. Discuss on the stereochemistry of Allenes and Biphenyls

SECTION-C

7. Discuss in detail about methods used for the resolution of chiral mixture

8. Give the details of :

   a) Hydrogen bonding

   b) Conjugation

   c) Resonance

   d) Polarity of bonds.

9. Write in detail about Quantum numbers and their significance

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student
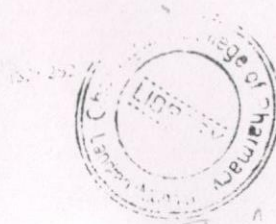
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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem.–1)

INORGANIC CHEMISTRY

Subject Code : BSBT-101-18

M.Code : 75324

Date of Examination : 19-05-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1) Answer briefly :

a) What is the Effective nuclear-charge?

b) Explain the covalent bond.

c) Explain the coordination number with examples.

d) Explain the geometrical isomerism.

e) Explain the paramagnetism and diamagnetism.

f) What are Vander waal forces?

g) Explain the structure of H_2O molecule?

h) What electron affinity.

i) What is the oxidation number?

j) What is inert pair effect?

SECTION-B

2) Explain the valence bond theory and its limitations.

3) Explain the structure of SF_6 and ClF_4.

4) Explain the effect of temperature on paramagnetism.

5) Explain electronegativity and its trend in period.

6) Explain Inter and Intra molecular H-bonding.

SECTION-C

7) Explain the back bonding with examples.

8) Explain the crystal field theory.

9) Explain the Werner's coordination theory.

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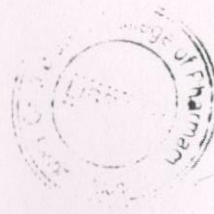
Roll No. ☐☐☐☐☐☐☐☐☐☐☐

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc.(BT) (Sem.–1)
# BASICS OF BIOSCIENCES
Subject Code : BSBT-107-18
M.Code : 75330
Date of Examination : 24-05-2023

Time : 3 Hrs.

Max. Marks : 30

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
2. SECTION-B contains FIVE questions carrying 2½ (Two and Half) marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying FIVE marks each and students has to attempt any TWO questions.

SECTION-A

1. Answer briefly :

   a) Oligosaccharide

   b) Vertebrates

   c) Anaphase

   d) Phospholipids

   e) Diversity

   f) Neuron

   g) Function of root

   h) Vascular tissue in plants

   i) Function of kidney

   j) Shrub.

SECTION-B

2. Discuss the basic features of Kingdom Monera.

3. Explain the significance of Meiosis.

4. Explain the morphology of flower.

5. Describe the organization of Plant cell.

6. Explain the role of protein in cell.

SECTION-C

7. Write a note on the cell as the Basic unit of life.

8. Discuss the structural organization in Animals.

9. Explain the biological classification.

1 | 21

July – 2023

B.Sc.(BT) (Sem–1)
# INTRODUCTION TO BIOTECHNOLOGY
Subject Code : BSBT-102-18
M.Code : 75325
Date of Examination : 26-05-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1 Write briefly :

   a) Traditional Biotechnology

   b) Marine Biotechnology

   c) Biotechnology in healthcare sector.

   d) BT cotton.

   e) GM papaya

   f) Food Biotechnology

   g) Food quality determinants

   h) L-asparaginase

   i) Alcoholic beverages

   j) Beers vs. wine

SECTION-B

2 Explain the importance of biotechnology in pharmaceutical sector

3 Give an overview of important biotechnological applications in agriculture sector

4 Compare properties of GM cotton and GM tomato. Also write a brief note on commercial aspects of GM crops in India.

5 Explain microbiological processes involved in developing value added food products and beverages

6 Write a brief note on the fermentative production of citric acid

SECTION-C

7 What is biotechnology? Explain its importance in the agricultural, environmental and food sectors

8 Discuss important microbiological procedures to obtain processed foods of high quality.

9 Define Fermentation Biotechnology. Illustrate its importance in producing microbial enzymes and beverages.

Roll No.

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc.(BT) (Sem–1)
# BIOCHEMISTRY AND METABOLISM
Subject Code : BSBT-103-18
M.Code : 75326
Date of Examination : 12-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly :

    a) What are amphibolic pathways?

    b) In which compartment of cell TCA cycle occurs?

    c) What is the role of cholesterol in fluid mosaic model?

    d) Draw structure of Galactose.

    e) Difference between Homopolysaccharides and Heteropolysaccharides.

    f) What are Co-enzymes? Give explanation.

    g) What are the main features of enzyme active sites?

    h) Give example of any Disaccharides.

    i) Explain the salient features of secondary structure of protein.

    j) What are the pyrimidines?

SECTION-B

2. Write a note on regulation of glycolysis

3. Write different classifications of enzymes

4. Write a note on cerebrosides and gangliosides

5. Draw well labeled structures of aromatic amino acid?

6. What are glycoproteins? Give their functions

SECTION-C

7. Write a note on classification of protein

8. Classify lipids along with their structures and functions.

9. Explain complete oxidation of one module of glucose

1 |

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Total No. of Questions : 09

B.Sc. (BT) (Sem–2)
PHYSICAL CHEMISTRY
Subject Code : BSBT-201-18
M.Code : 75872
Date of Examination : 13-06-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Define adiabatic process.

   b) Explain why no work is done when a gas expands against vaccum?

   c) Define phase.

   d) What is condensed system?

   e) What is transport number?

   f) What is overvoltage?

   g) Explain the term order.

   h) Define mole fraction.

   i) What is isotonic solution?
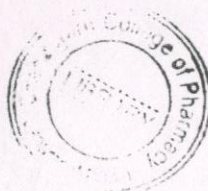
   j) What is osmosis?

SECTION-B

2. What are colligative properties? What do you mean by molal elevation constant of a solvent?

3. Derive Nernst equation for measuring EMF of a cell. Calculate the degree of hydrolysis of 0.1N solution of sodium acetate (the ionic product of water is 1.0×10^{-14} and dissociation constant of acetic acid is 1.8×10^{-5})

4. Calculate the entropy change when one mole of hydrogen is mixed with two moles of oxygen at room temperature. assuming that the gases behave ideally.

5. Derive the rate equation for first order reaction.

6. Explain carnot's cycle

SECTION-C

7. Derive the relationship between elevation in boiling point and relative lowering of vapour pressure.

8. List three criteria for phase equilibrium of a multi component system and one component system.

9. What is conductivity water?, parallel reactions, opposing reactions and chain reactions?

2 |

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July 2023

B.Sc. (Bio Technology) (Sem–2)
BIOSTATISTICS
Subject Code : BSBT-203-18
M.Code : 75874
Date of Examination : 02-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) What do you understand by Sample? Enlist the different methods of sampling.

   b) Give characteristics and properties of normal distribution curve.

   c) What are derivative curves?

   d) What are the differences between correlation and regression coefficients?

   e) Define Null Hypothesis and level of significance.

   f) Define randomization.

   g) What do you understand by Curve Smoothening? Give its purpose.

   h) What are the advantages of graphical representation of data?

   i) What do you understand by Precision? Enlist the methods used to measure precision of statistical tests?

   j) What do you mean by Matrices manipulations?

SECTION-B

2. Evaluate the determinant :

$$\begin{vmatrix} y^2 + z^2 & xy & xz \\ xy & z^2 + x^2 & yz \\ zx & zy & x^2 + y^2 \end{vmatrix}$$

3. Distinguish between Binomial and Poisson Distribution.

4. Explain Trapezoid rule of Numerical integration.

5. Find the means of X and Y variables and the coefficient of correlation between them from the following two regression equations :

$$4X - 5Y + 33 = 0$$

$$20X - 9Y - 107 = 0$$

6. Write a note on F and Z residuals.

SECTION-C

7. a) Calculate mean and standard deviation of following data

Marks		0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of Students		2	4	8	12	16	6	8	4

   b) Describe the methods of averages and least squares.

8. Write notes on :

   a) Fourier Transformation

   b) Polynomial Interpolations

9. a) Write a detailed note on 'ANOVA'.

   b) Describe different types of 'Design of Experiments'.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

B.Sc. (Bio Technology) (Sem–2)
BIOSTATISTICS
Subject Code : BSBT-203-18
M.Code : 75874
Date of Examination : 02-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) What do you understand by Sample? Enlist the different methods of sampling.

   b) Give characteristics and properties of normal distribution curve.

   c) What are derivative curves?

   d) What are the differences between correlation and regression coefficients?

   e) Define Null Hypothesis and level of significance.

   f) Define randomization.

   g) What do you understand by Curve Smoothening? Give its purpose.

   h) What are the advantages of graphical representation of data?

   i) What do you understand by Precision? Enlist the methods used to measure precision of statistical tests?

   j) What do you mean by Matrices manipulations?

SECTION-B

2. Evaluate the determinant :

$$\begin{vmatrix} y^2 + z^2 & xy & xz \\ xy & z^2 + x^2 & yz \\ zx & zy & x^2 + y^2 \end{vmatrix}$$

3. Distinguish between Binomial and Poisson Distribution.

4. Explain Trapezoid rule of Numerical integration.

5. Find the means of X and Y variables and the coefficient of correlation between them from the following two regression equations :

$$4X - 5Y + 33 = 0$$

$$20X - 9Y - 107 = 0$$

6. Write a note on F and Z residuals.

SECTION-C

7. a) Calculate mean and standard deviation of following data.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of Students	2	4	8	12	16	6	8	4

   b) Describe the methods of averages and least squares.

8. Write notes on :

   a) Fourier Transformation

   b) Polynomial Interpolations

9. a) Write a detailed note on 'ANOVA'.

   b) Describe different types of 'Design of Experiments'.

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Roll No. _____

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc.(BT) (Sem.–2)
INTRODUCTION TO MICROBIOLOGY
Subject Code : BSBT-202-18
M.Code : 75873
Date of examination : 30-05-23

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

    a. Biogenesis

    b. Microbial flora of healthy human

    c. Gram Staining

    d. Mesophiles and Extremophiles

    e. Amoebic dysentery

    f. Sterilization and Pasteurization

    g. Generation time

    h. Sporulation process in microbes

    i. Aflatoxins

    j. Role of Nitrogenase in nitrogen fixation.

SECTION-B

2. Describe the Koch postulates.

3. Explain the working principle of Scanning electron microscope.

4. Describe the salient features of viruses.

5. Explain the host defense mechanisms against pathogens with examples.

6. Describe the different phases of microbial growth with the help of diagram:

SECTION-C

7. Discuss the contributions of Antony Van Leeuwenhoek and Louis Pasteur in Microbiology.

8. What do you mean by true fungi? What are the unique features of slime molds that distinguish them from true fungi?

9. What are monoauxic, diauxic and synchronous growth? Describe different methods used for measurement of growth of microorganisms.

Total No. of Questions : 09

B.Sc. (BT) (Sem–2)

PHYSICAL CHEMISTRY

Subject Code : BSBT-201-18

M.Code : 75872

Date of Examination : 13-06-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Define adiabatic process.

   b) Explain why no work is done when a gas expands against vaccum?

   c) Define phase.

   d) What is condensed system?

   e) What is transport number?

   f) What is overvoltage?

   g) Explain the term order.

   h) Define mole fraction.

   i) What is isotonic solution?

   j) What is osmosis?

SECTION-B

2. What are colligative properties? What do you mean by molal elevation constant of a solvent?

3. Derive Nernst equation for measuring EMF of a cell. Calculate the degree of hydrolysis of 0.1N solution of sodium acetate (the ionic product of water is 1.0×10^{-14} and dissociation constant of acetic acid is 1.8×10^{-5})

4. Calculate the entropy change when one mole of hydrogen is mixed with two moles of oxygen at room temperature, assuming that the gases behave ideally.

5. Derive the rate equation for first order reaction.

6. Explain carnot's cycle

SECTION-C

7. Derive the relationship between elevation in boiling point and relative lowering of vapour pressure.

8. List three criteria for phase equilibrium of a multi component system and one component system.

9. What is conductivity water?, parallel reactions, opposing reactions and chain reactions?

July 2023

Roll No. ☐☐☐☐☐☐☐☐☐☐☐

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (Sem.–3)
MOLECULAR BIOLOGY
Subject Code : BSBT-303-18
M.Code : 76610
Date of Examination : 22-05-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Difference between prokaryotic and eukaryotic gene?

   b) What is a replicon?

   c) What is degeneracy in codons?

   d) Define frame-shift mutation.

   e) What are SSB proteins and their role?

   f) Which mutation is caused by UV radiation?

   g) What is Shine-Dalgarno sequence and what is its significance?

   h) What is TBP and its role?

   i) What are trans-acting genes?

   j) Difference between Operon and Regulon.

SECTION-B

2. Discuss the structure of nucleosome with diagram.

3. Describe the experiment which proved that DNA replication is semiconservative.

4. Discuss the proteins and enzymes required for transcription initiation.

5. What is induced mutation and how is it done?

6. Discuss how the antibiotics Kirromycin and Puromycin act as Translational inhibitors.

SECTION-C

7. Describe the replication initiation and termination in Prokaryotes.

8. Discuss the role of ribosomes, t-RNA and other enzymes in translation.

9. Discuss the Positive and Negative regulation of gene in gene expression.

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Roll No. ☐☐☐☐☐☐☐☐☐☐

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem.–3)
INTRODUCTION TO COMPUTERS
Subject Code : BSBT-307-18
M.Code : 76614
Date of Examination : 18-05-2023

Time : 3 Hrs.　　　　　　　　　　　　Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a. What is algorithm?

   b. Name any two latest languages used in computers.

   c. What is the need for computer software?

   d. Discuss voice response system.

   e. Define Primary storage.

   f. Write about online mode in computer.

   g. Write about Hard Disk.

   h. What is the use of Machine learning?

   i. Discuss DNA sequences.

   j. Write the need of bioinformatics.

SECTION-B

2. Write in short the functional units of Computer.

3. Discuss NCBI data model and its uses.

4. Write some output devices used in computer.

5. Explain the types of printers and their features.

6. Discuss the different ways of communication with computer.

SECTION-C

7. Give the brief introduction of Internet. Explain its use for the Biologist.

8. Discuss various mass storage devices used to store data in computer.

9. Give the introduction to sequence analysis and database searching. What is the role of computers in it?

Roll No. ☐☐☐☐☐☐☐☐☐☐☐

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem.–3)
ORGANIC CHEMISTRY
Subject Code : BSBT-301-18
M.Code : 76608
Date of Examination : 16-05-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
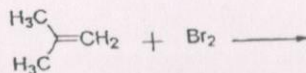3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a. Write IUPAC name for :

   $Br \diagup\diagdown\diagup\diagdown Cl$

   b. Complete the following reaction

   $\underset{H_3C}{\overset{H_3C}{>}}C=CH_2 + Br_2 \longrightarrow$

   c. Arrange the following in the increasing order of acidity:

   Phenol, 2 Methyl phenol, 2 chloro phenol.

   d. Define (-M) effect.

   e. What is Huckel's rule of aromaticity?

   f. Write stability order of primary, secondary and tertiary carbocation.

   g. Hyperconjugation involves delocalization of _____ electrons.

   h. Which alcohol does not react with Lucas's reagent?

   i. Write two chemical properties of alkanes.

   j. Which catalyst is used to catalyze the bromination reaction of phenol?

SECTION-B

2. Explain alkenes and alkanes in detail. Which test is used to distinguish between alkane and alkenes.

3. Define Kolbe's reaction with mechanism.

4. Benzene undergoes electrophilic substitution reaction. Why? Define halogenation and sulfonation reactions of benzene.

5. What are carbenes? Define hybridization present in singlet and triplet carbene with appropriate diagram.

6. Why is resonance more stable than hyperconjugation? Explain with appropriate examples.

SECTION-C

7. Define Marconicov's rule with suitable example(s). What are the limitations of Marconicov rule?

8. Define inductive effect in detail. What are the types of inductive effect? Write applications of inductive effect.

9. What are the types of organic reactions? Explain each with appropriate example.

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Roll No.

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT)   (Sem.–4)
ANALYTICAL TECHNIQUES IN BIOTECHNOLOGY
Subject Code : BSBT-407-18
M.Code : 77696
Date of Examination : 19-05-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1.   Write briefly :

a) Describe the applications of TLC.

b) What are rate zonal centrifuges?

c) What is PFGE?

d) Define isoelectric focussing

e) Define chemical shift

f) What is Beer-Lambert law?

g) What is the principle of SDS-PAGE?

h) Define Raman effect

i) What is analytical centrifuge?

j) Name two fluorophores used in fluorescence microscopy

SECTION-B

2.   What is autoradiography? Describe its principle and applications.

3.   Discuss the applications of absorption microscopy. What are the factors affecting absorption properties of a chromophore?

4.   Write a note of Western blotting

5.   Describe the technique and instrumentation of NMR spectroscopy

6.   What is phase contrast microscope? Describe its construction and working.

SECTION-C

7.   Discuss in detail the technique of HPLC

8.   Describe construction and working of SEM.

9.   What are the factors affecting sedimentation of a particle in a centrifuge? Describe different types of centrifuges.

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Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT)   (Sem.–4)
PLANT TISSUE CULTURE
Subject Code : BSBT402-18
M.Code : 77691
Date of Examination : 24-05-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Cellular totipotency

   b) Role of 2,4-D

   c) Suspension culture

   d) Explant selection

   e) Cell culture

   f) Embryogenesis

   g) Cloning

   h) HAT Selection

   i) Somatic cell fusion

   j) Organ micro-culture

SECTION-B

2   Write down about the steps involved in surface sterilization of an explant

3   Describe the composition of media and its sterilization.

4   Write short note on selection of hybrid clones

5   What are the steps involved in callus culture? Explain in detail

6   Write short note on monoclonal antibodies production

SECTION-C

7. Write short note on aseptic tissue transfer and somatic embryogenesis

8. Explain the role of growth hormones in culture media

9. Describe the process of plant micropropagation in detail

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student

Bachelor of Science (Bio Technology)(Sem. – 4)
INDUSTRIAL BIOTECHNOLOGY
Subject Code: BSBT403-18
M Code: 77692
Date of Examination : 26-05-23

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly:

   a) What are good Laboratory practices?

   b) Which organisms are exploited for the production of biofertilizers? Why they are better options as compared to chemical fertilizers?

   c) why E.coli is considered a good experimental microbe for industries?

   d) what is an ideal growth medium?

   e) what are the raw materials used for the production of penicillin and streptomycin antibiotics?

   f) Name any aerobic fermentation process and the microbe involved in it.

   g) Why Hop plant is added while manufacturing beer.

   h) What is the importance of immobilization of enzymes?

   i) Why cryopreservation is done of microbial cultures?

   j) Define OTR and its importance.

SECTION-B

2. Name any one fermented beverage and schematically describe its production process.

3. How the fungal cultures are preserved commercially?

4. What are industrial biocatalyst and their applications in food industries?

5. Define biofuels.Which substrates are used for their production? Discuss.

6. How ideal growth medium is prepared?

SECTION-C

7. Give in detail the role of microbes in industries.

8. What do you know about the design and operation of fermentors?

9. Explain the scope and applications of environmental biotechnology.
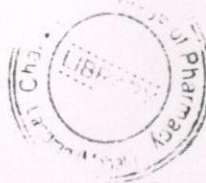
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Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (Sem.–4)
GENETIC ENGINEERING
Subject Code : BSBT-401-18
M.Code : 77690
Date of Examination : 17-05-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a. Define genetic engineering.

   b. Draw a labeled diagram of Biolistic gun or Microprojectile gun.

   c. Give the structure and properties of liposomes.

   d. Explain the principle of PCR.

   e. Write briefly on the properties of chimeric proteins.

   f. Outline features of transgenic animals.

   g. How do transgenic plants differ from wild type plants?

   h. Describe the significance of stem cell research in human health.

   i. Enlist the important human therapeutic proteins and their functions.

   j. What is the role of Agrobacterium tumefaciens in rDNA technology?

SECTION-B

2. Draw a well labeled diagram of a typical bacterial plasmid

3. Explain the principle of electroporation technique. Also discuss the procedure of obtaining recombinants using electroporation

4. Define the term mutagenesis. How do you generate mutants using random mutagenesis?

5. What are transgenics? Explain heterologous expression of genes in transgenic mice

6. Give an overview of the methods for developing transgenic plants

SECTION-C

7. Explain important methods of microbial gene transfer using suitable diagrams.

8. Describe the role of PCR technique in site directed mutagenesis and generation of mutants.

9. Write a detailed note on the production of human therapeutic proteins in transgenic animals.

B.Sc. (BT) (Sem–5)

ORGANIC FARMING

Subject Code : BSBT-501-18

M.Code : 78346

Date of Examination : 14-06-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Green manuring

   b) Soil enzymes

   c) Liquid organic manures

   d) NADEP

   e) Soil health card

   f) Bulky organic manure

   g) Homa fanning

   h) Bio-pesticide

   i) Consortium

   j) Contribution of Sir Albert Howard.

SECTION-B

2. Define organic farming. Discuss concept of organic farming.

3. Write a short note on phytoremediation.

4. a) Rock phosphate can be used in organic farming. comment.

   b) Composite variety seedscan be used in organic farming, comment.

5. Discuss use of soil health cards

6. Write a short note on degradation of pesticides by micro-organisms.

SECTION-C

7. Differentiate between vermiwash and vermicompost and how will you construct vermicompost unit and what types of earthworms are used for vermicomposting. Discuss its procedure from starting upto harvesting of Vermicompost. in detail. How can we use vermiwash?

8. a) Write-down the advantages and disadvantages of organic agriculture

   b) Discuss in detail about role of micro-organisms in degradation of pesticides.

9. a) Discuss the harmful effects of non-judicious chemical fertilization.

   b) Define sustainable agriculture. How organic farming will help in sustainable agriculture.

B.Sc (Bio Technology) (Sem–5)
FERMENTATION TECHNOLOGY
Subject Code : BSBT140-18
M.Code : 78351
Date of Examination : 09-06-2023

Time : 3 Hrs.

Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
2. SECTION-B contains FIVE questions carrying TWO AND A HALF marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) What is the difference between simple and complex reactions?

   b) Write the advantage of enzyme immobilization?

   c) What are the various processes involved in the upstream process?

   d) What is the difference between centrifugation and ultracentrifugation?

   e) Name a few microbes that are involved in the production of fragrances.

   f) Outline the production of propionic acid.

   g) Write the substrate for biodiesel production.

   h) Site a few examples of anti-cancerous agents.

   i) What is fermentation?

   j) Write the advantage of bio-fuels over conventional fuels?

SECTION-B

2. What are biosurfactants? Cite few examples?

3. What are the different types of cell immobilization?

4. What is Km? What are the different factors that affect Km?

5. Write the different chemotherapeutic agents and their applications?

6. What is the difference between primary and secondary metabolites? Cite a few examples.

SECTION-C

7. Write the steps involved in ethanol production from agricultural wastes. What are the different downstream processes used for ethanol purification?

8. Write a brief note on any two :

   a) Steroid fermentation

   b) Ion exchange chromatography

   c) Biodiesel

   d) Microbial insecticides.

9. What is biogas? How is it produced from agricultural waste?

B.Sc. (BT)   (Sem.–5)
HUMAN BEHAVIOUR & PSYCHOLOGY
Subject Code : BSBT-137-18
M.Code : 78348
Date of Examination : 07-06-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1) Write briefly :

a) Define cognitive psychology.

b) Why study of psychology is important?

c) Define perception.

d) What is memory?

e) Write the nature of intelligence.

f) Individual differences.

g) Personality tests.

h) Functions of memory.

i) Introvert personality.

j) What is the use of personality tests?

SECTION-B

2) Discuss the various theories of learning.

3) Discuss the nature & scope of psychology.

4) Explain the various models of intelligence.

5) What are the various issues involved in the assessment of intelligence?

6) What are the environmental & genetic bases for understanding individual differences?

SECTION-C

7) Discuss the features and attributes of perception.

8) Explain the environmental bases of individual differences.

9) Discuss the various sub fields of psychology. What are the applications of psychology to the study of human-behavior?

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Total No. of Questions : 09

B.Sc. (BT)   (Sem–5)
BIOTECHNOLOGY IN FORENSIC SCIENCES
Subject Code : BSBT142-18
M.Code : 78353
Date of Examination : 05-06-2023

Time : 3 Hrs.   Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
2. SECTION-B contains FIVE questions carrying $2\frac{1}{2}$ marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

    a) Define chronic injury.

    b) What does forensic handwriting analyst do?

    c) What are class 4 weapons?

    d) What do you mean by ballistics?

    e) Why are fingerprints important in forensic science?

    f) What is DNA profiling?

    g) Define cyber security.

    h) Define electronic discovery.

    i) What is forensic anthropology?

   j) What is the role of modus operandi in crime records?

SECTION-B

2. How are forensic evidences preserved?

3. What is the role of DNA fingerprinting in forensic investigation?

4. Describe forensic toxicology.

5. What is meant by seizure of digital evidence?

6. Which tests are used to identify the type of explosives?

SECTION-C

7. Write a note on tools and techniques in forensic science.

8. Discuss the organization and necessary elements of a forensic science laboratory.

9. Describe the role of computers in forensic science.

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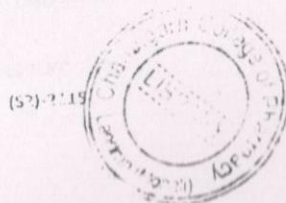
B.Sc. (BT)   (Sem.-6)
BIOTECHNOLOGY & HUMAN WELFARE
Subject Code : BSBT-148-18
M.Code : 79459
Date of Examination : 18-05-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C THREE questions carrying TEN mark each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Biofertilizers

   b) Xenobiotic compounds

   c) Recombinant vaccines

   d) DNA fingerprinting

   e) Microbial polysaccharides

   f) Monoclonal antibodies

   g) Human genome project

   h) Penicillin

   i) Gene therapy

   j) Chemical pesticides.

SECTION-B

2. How are microbes helpful in abatement of pollution.

3. Write a note on symbiotic nitrogen fixation.

4. What are the substrates used for industrial production of ethanol.

5. Describe production and use of biodegradable polymer.

6. How is biotechnology helpful in diagnosis of the disease Explain.

SECTION-C

7. Describe the role of biotechnology in criminal investigation.

8. Write a note on microbial production of therapeutic agents.

9. What is the scope of protein engineering ? Describe the techniques of protein engineering.

B.Sc. - Honours (Microbiology) (Sem.-6)
PLANT MICROBIAL INTERACTIONS
Subject Code : BSMB605-20
M.Code : 92521
Date of Examination : 16-05-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

I. Write a brief note on the following :

a) Mutualism

b) Phylosphere

c) Mycorrhizae

d) Phytohormones

e) Dairy Products

f) Microorganisms as food

g) Endotoxins

h) Nutrients

i) Microbial interactions

j) Plant disease

SECTION-B

2. Give an account on Toxicology of microbes in relation to dairy products.

3. Write a brief note on plant defense mechanism against microbes.

4. Write a short note on Nitrogen fixation.

5. Give an account on role of bactericidal agents for plants.

6. Discuss important plant pathogenic organisms.

SECTION-C

7. Discuss future prospects challenges and limitations of plant microbial interactions.

8. Give an account on various plant extract and their role in antifungal agents.

9. Discuss multitude functions of microbial consortia in rhizosphere with emphasis on phytohormones.

July-2023

Total No. of Questions : 09

B.Sc (BT) (Sem.–6)
TECHNICAL WRITING
Subject Code : BSBT-601-18
M.Code : 79456
Date of Examination : 16-05-2023

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) How do we define technical writing?

   b) What is persuasion?

   c) What points should we keep in mind while collecting material?

   d) What points should we keep in mind while describing any mechanism?

   e) What are primary sources?

   f) What is a rough draft?

   g) What is plagiarism?

   h) Elaborate one technical writing style.

   i) What is a research report?

   j) List two important points to write an outline.

SECTION-B

2. Elaborate audience analysis

3. How do we arrange description of process?

4. Discuss Job Application procedure

5. Discuss important elements of a formal report.

6. Elaborate research techniques.

SECTION-C

7. Elaborate different aspects of technical writing.

8. Write an application for the post of a Manager in a reputed company. Draft your resume. Imagine all details.

9. Discuss professional ethics in detail.

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Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (Bio Technology)   (Sem.–6)
PLANT BIOTECHNOLOGY
Subject Code : BSBT151-18
M.Code : 79462
Date of Examination : 20-05-2023

Time : 3 Hrs.

Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.s
2. SECTION-B contains FIVE questions carrying TWO and HALF marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Hybrid cell

   b) Nitrogenase

   c) Pluripotent

   d) Haploid

   e) Stem cell

   f) Differentiation

   g) Meristem culture

   h) Embryogenesis

   i) Microspore culture

   j) Biocontrol of pathogens.

SECTION-B

2. Write a short note on callus culture.

3. What do you understand by diplodization? Explain.

4. Explain plant growth promoting bacteria with suitable example.

5. Give the applications of somaclonal variation.

6. Discuss the briefly somatic hybridization.

SECTION-C

7. Explain the process of micropropagation along with its advantages.

8. Give an account of protoplast isolation and culture techniques.

9. Write short notes on anther culture and nitrogen fixation.

July-2023

B.Sc (Bio Technology) (Sem.–6)
BIOINFORMATICS
Subject Code : BSBT149-18
M.Code : 79460
Date of Examination : 25-05-23

Time : 3 Hrs.

Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
2. SECTION-B contains FIVE questions carrying TWO AND A HALF marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Applications of bioinformatics

   b) Local alignment

   c) Identity in sequence alignment

   d) Genomics

   e) Motif

   f) Biological databases

   g) FASTA

   h) Protein folding

   i) Pairwise alignment

   j) Neural network.

SECTION-B

2. Enlist the factors affecting the choice of template selection during homology modeling.

3. Give a short note on Smith-Waterman algorithm.

4. Discuss protein threading approach

5. Give the applications of bioinformatics in computer aided drug designing.

6. Write a note on scoring matrices

SECTION-C

7. Explain various approaches used in multiple sequence alignment.

8. What is phylogeny? What are the various methods for phylogenetic analysis?

9. Elaborate Chou-Fasman and GOR methods for predicting secondary structure.

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B.Sc. (Bio Technology) (Sem–6)
DEVELOPMENTAL BIOLOGY
Subject Code : BSBT-147-18
M.Code : 79458
Date of Examination : 27-05-2023

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

   a) Spermatogenes

   b) Meroblastic cleavage

   c) Secondary embryonic induction

   d) Gastrulation

   e) Function of placenta

   f) Fate maps

   g) Neurulation

   h) Function of placenta

   i) Emboly

   j) Plasticity

SECTION-B

2. Discuss briefly the different types of morphogenetic processes involved in development of organism.

3. What are fate maps? Write down the methods to construct the fate maps.

4. Classify eggs based on the amount of yolk.

5. Write a short note on types of embryonic induction.

6. Describe briefly about organogenesis.

SECTION-C

7. Write a detailed note on types of embryonic differentiation.

8. Illustrate the stages of oogenesis with the help of diagram.

9. Write in detail about formation and differentiation of primary germ layers.

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