

Roll No.
Total No. of Questions : 09

Total No. of Pages : 92

B.Sc. (BT) (Sem.-2)
PHYSICAL CHEMISTRY
Subject Code : BSBT-201-18
M.Code : 75872
Date of Examination : 19-05-2025

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 extensive and intensive properties.
- b) The activation energy of a reaction is 94.14 kJ/mol and rate constant at 30°C is $1.8 \times 10^{-5} \text{ sec}^{-1}$. Calculate the frequency factor, A.
- c) Write a note on colligative properties.
- d) How is conductance measured?
- e) What is pH scale? What is its role in biochemistry?
- f) Define enthalpy of formation. How it can be determined?
- g) How is Raoult's law used to determine the vapour pressure of solutions?
- h) Why reactions with high molecularity are generally not feasible?
- i) What do you mean by Buffer action?
- j) Define Gibbs free energy and give its significance.

SECTION - B

2. Derive Hess's law of constant heat summation. Enlist its any two applications.
3. Under what conditions the molecular mass of a solute comes out to be abnormal. How it can be corrected.
4. Discuss the factors affecting the rate of a reaction using suitable examples.
5. Plot the variation of specific and equivalent conductance of acetic acid and HCl with dilution. Explain the reasons in their behavior.
6. Derive relation between heat of reaction at constant pressure (q_p) and heat of reaction at constant volume (q_v). Under what conditions both become equal.

SECTION - C

7. a) Discuss in detail about efficiency of a heat engine in relation to Carnot Theorem.
b) Derive thermodynamically Gibbs phase rule.
8. a) Give the assumptions of Arrhenius theory of electrolyte dissociation. Under what conditions it fails.
b) Discuss the kinetics of Chain reactions taking suitable example.
9. a) Define salt hydrolysis. Derive expression for hydrolysis constant of a salt formed from strong acid and a weak base.
b) Explain Lever rule. How it is used in the distillation of ideal and non-ideal solutions.



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June - 2025

Total No. of Pages : 02

B.Sc.(BT) (Sem.-2)
INTRODUCTION TO MICROBIOLOGY
Subject Code : BSBT-202-18
M.Code : 75873
Date of Examination : 22-05-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

- 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 :
- Koch postulates
 - Abiogenesis
 - Microbiology
 - Fermentation
 - Unique features of slime molds.
 - SEM and TEM
 - Resolving Power
 - Lithotrophs and Chemotrophs
 - Antibiosis with examples
 - Host defense mechanisms against pathogens.

SECTION • B

2. Explain the principle of bright field and dark field microscopy.
3. Describe the features of Gram positive and Gram negative bacteria.
4. Differentiate between sterilization and pasteurization process.
5. Describe monoaxic, diauxic and synchronous growth.
6. Discuss the contributions of Louis Pasteur in Microbiology.

SECTION - C

7. Describe the principle, working and applications of fluorescent microscope.
8. Describe about various chemical and physical agents used to control microorganisms.
9. How nitrogen is metabolized and recycled in nature? Discuss the role of microorganisms in this process in detail.

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June - 2025

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem.-2)

BIOSTATISTICS

Subject Code : BSBT-203-18

M.Code : 75874

Date of Examination : 26-05-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

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

SECTION - A

1. Write briefly :

- Define Standard Deviation with formula.
- What is the Probability that a leap year selected at random will contain 53 Sundays?
- Define Degrees of Freedom.
- Define replication.
- Define Z residuals.
- Calculate mean for the data 8, 6, 5, 7 and 4.
- What do you mean by determinants?
- Define Precision.
- Give two uses of probable error.
- What do you mean by $p < 0.05$?

SECTION - B

- A problem in maths is given to five students. A, B, C, D and E. Their chances of solving it are $1/2, 1/3, 1/4, 1/5$ and $1/6$. What is the probability that the problem will be solved?
- Give a brief note on Least squares.
- Write a short note on matrices manipulations.
- From the given data below obtain the two regression equations :

X:	6	2	10	4	8
Y:	9	11	5	8	7

- Describe about derivative curves.

SECTION - C

- A tea company appoints four salesmen A, B, C and D and observes their sales in three seasons - summer, winter and monsoon. The data is given below

Seasons	Salesmen				Season's total
	A	B	C	D	
Summer	36	36	21	33	128
Winter	28	29	31	32	120
Monsoon	26	28	29	29	112
Salesmen's total	90	93	81	96	360

Perform the Two Way ANOVA for the above data
For $F_{0.05}(3,6) = 4.76$; For $F_{0.05}(2,6) = 5.14$.

- Give a detailed account of Fourier transformation.
- The following mistakes per page were observed in a book :

No. of mistakes per page	0	1	2	3	4
No of times the mistake occurred	211	90	19	5	0

Fit a poisson distribution to fit data. (Given $e^{-0.439} = 0.6447$)

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June 2025

Roll No.

Total No. of Pages : 02

Total No. of Questions : 07

B.Com. (Hons.) / BA(JAMC) / BHMCT / B.Sc. (FD/
MLS) / BBA (SIM) / BBA / BTM (Sem.-2)

ENVIRONMENTAL STUDIES

Subject Code : EVS-102-18

M.Code : 75831

Date of Examination : 05-05-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. Attempt ALL questions in SECTION-A, Each question carry 2 marks
2. Attempt any FOUR questions from SECTION-B, Each question carry 10 marks.

SECTION - A

I. Answer all parts of the question :

- a) Define biomes.
- b) Define ecological succession.
- c) What is meant by food chain?
- d) List any four air pollutants which affect materials.
- e) What are the causes of soil erosion?
- f) List any two major global effects of air pollution.
- g) Name any two methods of wasteland reclamation.
- h) What is meant by desertification?
- i) How does acid rain occur?
- j) What are GHGs? Name any four GHGs in the descending order of their global warming potential.

SECTION - B

2. Critically examine how environmental benign is the various alternate energy resources?
3. Explain the energy flow in a typical marine ecosystem.
4. Discuss the uses, functions and values of forest resources. List the causes and effects of its degradation.
5. Consider India as a mega biodiversity nation; explain the biogeographical regions of India and its biodiversity hot spots.
6. "Increasing sea level and climate change are major impacts of environmental pollution" Discuss the various global effects.
7. List and contrast the major environmental problems in urban and rural areas. Suggest remedial measures.

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June - 2025

Roll No. []

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B.Sc. (BT) (Sem.-4)

PLANT TISSUE CULTURE

Subject Code : BSBT-402-18

M.Code : 77691

Date of Examination: 20-05-2025

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 the term "explant" and explain its role in initiating plant tissue cultures.
- b) When was the term "tissue culture" first used in the context of plants?
- c) What are the main components of a typical plant tissue culture medium?
- d) Define "somatic embryogenesis".
- e) What is callus and how is it formed during in vitro culture?
- f) Describe the importance of vitamins in plant tissue culture. Give an example of a commonly used vitamin.
- g) What is the purpose of incubation in plant tissue culture?
- h) Explain the concept of selective media and its importance in cell selection.
- i) What are monoclonal antibodies?
- j) Explain the difference between callus culture and organogenesis.

SECTION-B

2. Discuss the basic principles of plant tissue culture. Give fundamental steps involved in initiating a tissue culture.
3. Define in vitro culture and explain its significance in plant tissue culture. How does in vitro culture differ from traditional propagation methods?
4. Discuss the applications of cloning in plant conservation. How can tissue culture techniques aid in the preservation of endangered plant species through cloning?
5. Discuss the techniques used for the genetic transformation of plants via tissue culture. What are the most common methods and how do they contribute to the development of genetically modified organisms?
6. Define cloning in the context of plant tissue culture. What are the main techniques used for cloning plants and how do they differ from traditional propagation methods?

SECTION-C

7. Discuss the various types of cloning and selection of specific cells in plant tissue culture. Compare their applications.
8. Describe the essential nutrients required for optimal plant tissue culture growth. Discuss the roles of macronutrients and micronutrients and explain how their concentrations can affect tissue growth and development.
9. Describe the different types of in vitro culture techniques. Explain the specific applications and advantages of each method in plant propagation and genetic improvement.

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June-2025

Roll No.

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Total No. of Questions : 09

B.Sc. (Biotechnology) (Sem.-4)
INDUSTRIAL BIOTECHNOLOGY
Subject Code : BSBT-403-18
M.Code : 77692
Date of Examination : 23-05-2025

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) Bakers Yeast and its use.
- b) Sparger
- c) CSTR
- d) Specific medium
- e) Industrial Biotechnology
- f) Fringes generator
- g) Name two microorganisms used for Vitamin B1 and B12 production.
- h) Biofuel
- i) Constraints of Biofertilizers.
- j) Bioremediation

SECTION - B

2. How bio transformations are better than Chemical transformation?
3. Describe the role of hops in beer production?
4. Discuss about the important elements for the preparation of production media.
5. Describe the biochemistry of microbial production of citric acid.
6. Write a brief note on biocontrol agents.

SECTION - C

7. Describe the up-streaming and down-streaming process for the production of Penicillin.
8. Define Immobilization. Discuss its types and applications in biotech industry.
9. Differentiate the following :
 - a) Red wine and White wine
 - b) Beer and whisky



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June-2025

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem.-4)
ANALYTICAL TECHNIQUES IN BIOTECHNOLOGY

Subject Code : BSBT407-18

M.Code : 77696

Date of Examination: 27-05-2025

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 briefly:

- a) Discuss the applications of paper chromatography.
- b) What are the common applications of absorption spectroscopy?
- c) What is the significance of the Stokes and anti-Stokes lines in a Raman spectrum?
- d) Define limit of resolution and numerical aperture.
- e) How does an electric field affect the movement of charged particles in electrophoresis?
- f) What is the principle of sedimentation in centrifugation?
- g) How does stationary phase differ from mobile phase in chromatography?
- h) What are the main applications of affinity chromatography in biotechnology?
- i) How are proteins separated in Western blotting?
- j) How does PAGE differ from agarose gel electrophoresis?

SECTION-B

2. Explain the principle of NMR spectroscopy and the role of nuclear spin in generating NMR spectra.
3. Discuss the significance of the Beer – Lambert law in quantitative analysis using absorption spectroscopy.
4. Describe the process of data analysis in Raman spectroscopy, including how to interpret peaks and their corresponding molecular vibration.
5. Discuss the principle and applications of SEM.
6. Explain the principles of rate – zonal centrifugation and describe how it separates particles based on their size and density.

SECTION-C

7. Discuss the significance of electrophoresis in the separation and analysis of proteins, including the role of SDS – PAGE.
8. Discussion exchange chromatography in terms of their principles, equipment and applications.
9. Describe HPLC in terms of their principles, equipment and applications.



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June-2025

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Total No. of Pages : 02

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B.Sc. (BT) (Sem.-4)
GENETIC ENGINEERING
Subject Code : BSBT401-18
M.Code : 77690

Date of Examination : 06-05-2025

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 the difference between a high-copy and a low-copy plasmid?
- (b) What is chromosome jumping?
- (c) What is the significance of antibiotic resistance genes in plasmids?
- (d) What is the role of a micromanipulator in microinjection?
- (e) What is molecular pharming?
- (f) How does gene shuffling differ from traditional genetic recombination?
- (g) How does random mutagenesis differ from targeted mutagenesis?
- (h) What is the primary purpose of creating transgenic animals?
- (i) How is plant viruses utilized as episomal expression vectors?
- (j) What is the significance of the T-DNA region in Ti plasmids?

SECTION-B

2. Explain the process of bacterial conjugation in detail.
3. What are Episomes, Ultrasonication and Microlaser?
4. How one can select the mutant peptides by Phage display techniques?
5. Give applications of gene targeting.
6. Explain the production of therapeutic products by genetic engineering.

SECTION-C

7. Describe the principles and techniques used in protein engineering.
8. Describe the methods and techniques along with applications used in plant genetic engineering.
9. Give a detailed note on site-directed mutagenesis.

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June-2025

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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc (BT) (Sem.-6)
TECHNICAL WRITING
Subject Code : BSBT601-18
M.Code : 79456
Date of Examination : 05-05-2025

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 professional ethics?
- b) Explain the importance of technical writing style.
- c) What is letter?
- d) What are library resources?
- e) What is rough draft?
- f) What is analysis of materials?
- g) What are the characteristics of formal research report?
- h) Explain the importance of research techniques.
- i) What is research report?
- j) What is grammar?

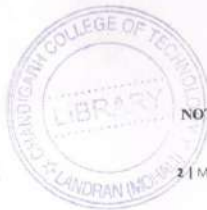
SECTION - B

2. What are the essential components of proposal writing and how can it be effectively structured to achieve its purpose?
3. Explain the importance of describing mechanisms and processes in technical and academic contexts, highlighting key steps for effective description.
4. Discuss the key aspects of technical writing and its importance in professional and academic settings.
5. Discuss the essential research techniques used in academic and professional research, highlighting their significance and application.
6. What is plagiarism and how can it be prevented in academic and professional writing?

SECTION - C

7. Write a formal report on the declining productivity in your organization, outlining the causes, effects and recommendations for improvement.
8. Draft-a structured resume for the position of a Marketing Manager, highlighting relevant skills, work experience and achievements.
9. Explain the different types of audience analysis in communication and their importance in creating effective communication.

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June-2025

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Bio Technology) (Sem-6)
DEVELOPMENTAL BIOLOGY
Subject Code : BSBT147-18
M.Code : 79458
Date of Examination : 06-06-2025

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 Epiboly and Emboly.
- b) Write a short note on historical perspective of developmental biology.
- c) How many different types of eggs are formed based on yolk?
- d) Write a short note on types of blastulation.
- e) Where does embryonic cleavage typically occurs?
- f) What are the consequences of abnormal cleavage patterns?
- g) How does differentiation relate to embryonic development?
- h) Describe the concept of lineage commitment during differentiation.
- i) Difference between primary and secondary induction.
- j) Describe the process of cell migration during organogenesis.

SECTION - B

2. What is notogenesis? Explain development of vertebrate eye?
3. Define cleavage. Explain the process of formation and differentiation of primary germ layers.
4. Discuss the signaling pathways and factors involved in Embryonic differentiation.
5. How do transcription factors regulate cellular differentiation?
6. How does endoderm contribute to organogenesis?

SECTION - C

7. Describe the process of gametogenesis.
8. Explain the process of organogenesis in detail.
9. Write a detailed note on Blastulation and Gastrulation.

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June-2025

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem.-6)
BIOTECHNOLOGY & HUMAN WELFARE
Subject Code : BSBT148-18
M.Code : 79459

Date of Examination : 19-05-2025

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) Name any two free living micro-organisms involved in nitrogen fixation.
- b) Name any two methanogenic bacteria.
- c) Define Epitope.
- d) Define Somatic cell gene therapy.
- e) Give the advantages of industrial alcohol.
- f) Give the techniques used for protein engineering.
- g) Give the applications of DNA fingerprinting.
- h) Give criteria for selecting candidates for gene therapy.
- i) Give any four methods for the degradation of agricultural waste.
- j) Name any two anti-biotic producing bacteria.

SECTION - B

2. Discuss the method of integrating pest resistance genes into plants citing one example?
3. Discuss briefly degradation pathway of chlorinated organic pollutants.
4. Discuss the process of monoclonal antibody production in *E.coli*.
5. Define recombinant live vaccines with examples and give advantages of these vaccines over conventional vaccines.
6. Discuss substrates used for the production of industrial alcohol.

SECTION - C

7. Describe the phenomenon of nitrogen fixation and why it is important?
8. Discuss the development of PHB.
9. Write short notes on the following :
 - a) DNA fingerprinting
 - b) Gene Therapy

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June-2025

Roll No.

Total No. of Pages : 02

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B.Sc (Bio Technology) (Sem.-6)

BIOINFORMATICS

Subject Code : BSBT149-18

M.Code : 79460

Date of Examination : 22-05-2025

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

I. Write briefly :

- a) Global alignment
- b) TBLASTX
- c) PubMed
- d) Rooted tree
- e) Dynamic Programming
- f) E value
- g) Cladogram
- h) File format
- i) Citations
- j) Pairwise sequence alignment

SECTION - B

2. Discuss any protein structure database in brief.
3. Discuss briefly the *in silico* applications of Bioinformatics.
4. Discuss the UPGMA method for phylogenetic analysis.
5. Differentiate between Primary and Secondary databases. Explain giving suitable examples.
6. Give an overview on the applications of Bioinformatics.

SECTION - C

7. Explain the Progressive Alignment method for Multiple Sequence Alignment. Name a few tools for performing MSA.
8. Write a note on the Chou-Fasman and GOR method for protein structure prediction.
9. Write a note on BLAST algorithm and its types.

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June-2025

Roll No.

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B.Sc. (Bio Technology) (Sem.-6)
PLANT BIOTECHNOLOGY
Subject Code : BSBT151-18
M.Code : 79462
Date of Examination : 26-05-2025

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 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

I. Define the following :

- a) Organogenic differentiation
- b) Callus culture
- c) Anther culture
- d) Nitrogenase
- e) Free-living bacteria
- f) Ploidy level
- g) Somaclonal variation
- h) Diploidization
- i) Embryogenesis
- j) Chromosome elimination

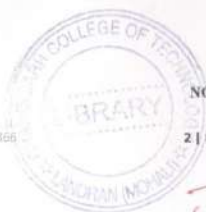
SECTION - B

2. What is the potential of somatic hybridization?
3. How can shoot tip be cultured?
4. Explain the significance and use of haploids.
5. Discuss any one method of protoplast fusion.
6. Discuss the biocontrol of pathogens.

SECTION - C

7. Write a note on the process of Nitrogen fixation by bacteria.
8. Explain the culture and fusion methods of Protoplast isolation.
9. Discuss the advantages and disadvantages of Micro-propagation.

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June-2025

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem-6)
ENVIRONMENT BIOTECHNOLOGY
Subject Code : BSBT150-18
M.Code : 79461
Date of Examination : 03-06-2025

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 2½ (Two and Half) marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

I. Answer Briefly :

- a) What are the main sources of conventional fuels in rural and urban areas?
- b) Write any two challenges that the microbial hydrogen production faces.
- c) Which type of bacteria plays a key role in hydrocarbon degradation?
- d) Plants play a major role in maintaining atmospheric oxygen levels through which process?
- e) What is the role of animals in seed dispersal?
- f) Which agricultural crop is a major source of ethanol for gasohol production?
- g) Give two examples of biofertilizers.
- h) What is the primary end product of Methanogenic bacterial metabolism?
- i) What is the primary oxidizing agent in the bioleaching of copper?
- j) Name the pollutant which is most difficult for microbes to degrade.

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2 | M-79461

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SECTION - B

2. 'Are all fungi used as biofertilizers'? Justify your answer.
3. What microbial pathways are utilized for sustainable hydrogen production?
4. What are the benefits of biogas production from animal waste?
5. Briefly discuss about the bioremediation of water contaminated with oil spills and heavy metals.
6. How can genetically modified microbes enhance bioleaching efficiency?

SECTION - C

7. Write a detailed note on enrichment of ores by micro organisms.
8. Define Phytoremediation. Also discuss about its scope, advantages and limitations.
9. Elaborate on the secondary treatment strategies for municipal waste and industrial effluents.

June-2025

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT) (Sem.-6)
MEDICAL MICROBIOLOGY
Subject Code : BSBT152/18
M.Code : 79463

Date of Examination : 29-05-2025

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 & 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

I. Write briefly :

- a) Nosocomial infections
- b) Virulence factors
- c) Pathogenesis of *B. abortus*
- d) Symptoms of infection caused by *Chlamydiae*
- e) AIDS
- f) Rhabdoviruses
- g) Pox viruses
- h) Blood borne infection
- i) Amoebiasis
- j) Dermatophytosis

SECTION - B

2. Discuss laboratory diagnosis techniques and preventive measures used for *C. botulinum*
3. Write down the morphology and pathogenesis of *H. influenza*.
4. Discuss the symptoms and treatment strategies for infection caused by Herpes viruses
5. How is subcutaneous infection caused by *Cryptococcus*?
6. Write a short note on importance of medical microbiology.

SECTION - C

7. Discuss in detail the morphology, pathogenesis, symptoms, laboratory diagnosis, preventive measures for disease caused by *C. diphtheriae* and *T. pallidum*.
8. What is hepatitis? Explain the role of viruses in causing hepatitis along with symptoms of infection and treatment strategies.
9. What are opportunistic fungal infections? Discuss causative agent of Aspergillosis and Candidiasis, their symptoms and strategies employed for treatment.

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.



June-2025

Roll No.

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 : 09-01-2026

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 do you mean by Paramagnetism?
- b) What do you mean by covalent bond?
- c) Explain two limitations of Valence bond theory.
- d) Define Hydrogen bonding.
- e) What do you mean by geometrical isomers?
- f) Define Electroneutrality.
- g) Define Vander wall forces.
- h) Define Coordination bond.
- i) Explain hybridization in PF_6 .
- j) Define hybridization.



NOV 2025

SECTION -B

2. Explain the directional characteristics of covalent.
3. Explain the hybridization of IF_7 , BF_3 .
4. Explain the optical isomers.
5. What do you mean by Effective nuclear charge?
6. Explain the back bonding.

SECTION-C

7. Explain Werner's coordination theory.
8. Explain the limitation of Valence bond theory.
9. Explain the Crystal field theory.

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.

Roll No.

Total No. of Pages: 02

Total No. of Questions : 09

B.Sc.(BT) (Sem.-1)
INTRODUCTION TO BIOTECHNOLOGY

Subject Code : BSBT-102-18

M.Code : 75325

Date of Examination : 12-01-2026

Time : 3 Hrs.

Max. Marks : 60

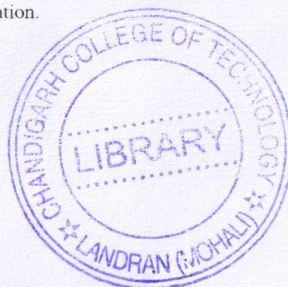
INSTRUCTIONS TO CANDIDATES :

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 the following :

- a) What do you mean by pharmaceutical biotechnology?
- b) Write the name of two private biotech institutions in India.
- c) Mention any two marine biotechnology applications.
- d) Define BT crops and give one example.
- e) What is the role of biotechnology in healthcare?
- f) Mention one bacterial and one fungal organism used in fermentation.
- g) Define quality in terms of food biotechnology.
- h) List two industrial uses of penicillin.
- i) What are the by-products of beer production?
- j) What is the function of L-Asparaginase in cancer therapy?



NOV 2025

SECTION - B

2. Describe the various branches of biotechnology with suitable applications.
3. Illustrate the development of insect-resistant plants using biotechnology.
4. Explain how biotechnology enhances the nutritional value of food products?
5. Describe the microbial fermentation process for producing acetic acid.
6. Discuss the contribution of the Department of Biotechnology (DBT) in India's biotech growth.

SECTION - C

7. Give a detailed account of the history and evolution of biotechnology, including major breakthroughs.
8. Describe the development and evaluation process of genetically modified papaya. Highlight its pros and cons.
9. Explain the production process of L-Asparaginase and its significance in pharmaceutical biotechnology.

NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC against the Student.

Total No. of Questions : 09

B.Sc.(BT) (Sem.-1)
BIOCHEMISTRY AND METABOLISM
Subject Code : BSBT-103-18
M.Code : 75326
Date of Examination : 16-01-2026

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

- 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) Define isoelectric point (pI).
 - b) What is the difference between essential and non-essential amino acids?
 - c) What is allosteric regulation?
 - d) Define enzyme activity.
 - e) Write the net ATP yield of glycolysis.
 - f) Define Gluconeogenesis.
 - g) Explain the functions of phospholipids.
 - h) Discuss the biological functions of glycoproteins.
 - i) State difference between monomeric and oligomeric enzymes.
 - j) Name the rate-limiting enzyme of TCA cycle.

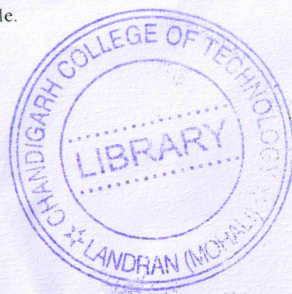
SECTION - B

2. Explain structure, function and properties of carbohydrates.
3. Compare and contrast the fate of pyruvate under aerobic and anaerobic conditions. Include energy yield and end products.
4. Define essential fatty acids. Discuss the structure, types, dietary sources and importance of linoleic acid (omega-6) and alpha-linolenic acid (omega-3).
5. Describe the process of oxidative phosphorylation in Mitochondria. Illustrate with a neat labelled diagram.
6. Define enzymes and discuss their general properties. Explain how enzymes lower activation energy and increase reaction rates?

SECTION - C

7. With the help of a neatly labelled flow chart, describe how electrons move from NADH and FADH_2 to oxygen through the electron transport chain? Indicate ATP yield and the role of the proton gradient.
8. Describe the four levels of protein structure, highlighting the types of bonds and interactions stabilizing each level. Add neat sketches or flow diagrams.
9. Describe the oxidative and non-oxidative phases of the pentose phosphate pathway. Include the role of NADPH and ribose-5-phosphate.

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NOV 20 25

Total No. of Pages : 04

Total No. of Questions : 11

B.Com (Honours)/B.A. (JAMC)/ B.Sc. Honours (Microbiology / Nutrition and Dietetics)/B.Sc. (AI&ML)/B.Sc. (BT/FD/IT/G&WD)/MLS/OTT/ Radiotherapy Technology/B.Voc. (Child Caregiver)/

BTTM/BHMCT/BBA/BCA/IT (Sem-1)

HUMAN VALUES, DE-ADDICTION AND TRAFFIC RULES

Subject Code : HVPE101-18

M.Code : 93322

Date of Examination : 07-01-2026

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

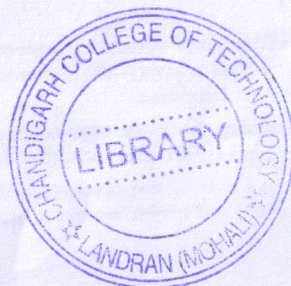
1. Section-A is compulsory ONE mark each.
3. Section-B contains FIVE questions of FOUR marks each attempt all questions.
4. Section-C contains FIVE questions of SIX marks each attempt all questions.

SECTION-A

(10 × 1 = 10)

1. Answer the following :

- i) What is the content of self exploration?
आत्म-अन्वेषण की विषय-वस्तु क्या है?
ਸਵੈ-ਪੜਚੋਲ ਦੀ ਵਿਸ਼ਾ ਵਸਤੂ ਕੀ ਹੈ?
- ii) What is Artistic-Value?
कलात्मक-मूल्य क्या है?
ਕਲਾਤਮਕ-ਮੁੱਲ ਕੀ ਹੈ?
- iii) What is Material Order?
सामग्री आदेश क्या है?
ਸਾਮਗਰੀ ਆਦੇਸ਼ ਕੀ ਹੈ?
- iv) What is innateness?
स्वाभाविकता क्या है?
ਸਵਾਭਾਵਿਕਤਾ ਕੀ ਹੈ?



(S-17) 2142

NOV 2025

- v) Explain harmony in family?

परिवार में तालमेल के बारे में बताएं।

ਪਰਿਵਾਰ ਵਿੱਚ ਤਾਲਮੇਲ ਦੇ ਬਾਰੇ ਵਿੱਚ ਦੱਸੋ।

- vi) What are the activities and needs of self and body?
 आत्म और शरीर की गतिविधियाँ और आवश्यकताएँ क्या हैं?
 सदैव अਤੇ सगरीर ਦੀਆਂ ਜਰੂਰਤਾਂ ਅਤੇ ਗਤੀਵਿਧੀਆਂ ਕੀ ਹਨ?

- vii) What are the different patterns of differentiation?

भेदभाव के विभिन्न पैटर्न क्या हैं?

ਫਰਕ ਦੇ ਵੱਖ ਵੱਖ ਪੈਟਰਨ ਕੀ ਹਨ?

- viii) What do you mean by Respect?

आप का सम्मान से क्या मतलब है?

ਤੁਹਾਡਾ ਆਦਰ ਤੋਂ ਕੀ ਮਤਲਬ ਹੈ?

- ix) How the value “Guidance” is related with Self.

मूल्य “मार्गदर्शन” स्वयं के साथ कैसे संबंधित है?

ਮੱਲ ਅਗਵਾਈ ਸਵੈ ਦੇ ਨਾਲ ਕਿਵੇਂ ਸਬੰਧਤ ਹੈ?

- x) What is Gratitude?

कृतज्ञता क्या है?

ਕ੍ਰਿਤਗਿਅਤਾ ਕੀ ਹੈ?

SECTION-B

 $(5 \times 4 = 20)$

2. How do you mean by values? How do they differ from skills? How values and skills are complementary.

मूल्यों से आप क्या समझते हैं? वे कौशल से किस प्रकार भिन्न हैं? मूल्य और कौशल एक-दूसरे के पूरक कैसे हैं?

ਮੁੱਲਾਂ ਤੋਂ ਤੁਹਾਡਾ ਕੀ ਮਤਲਬ ਹੈ? ਉਹ ਗੁਨਰਾਂ ਤੋਂ ਕਿਵੇਂ ਵੱਖਰੇ ਹਨ? ਮੁੱਲ ਅਤੇ ਗੁਨਰ ਕਿਵੇਂ ਪਰਕ ਹਨ?

3. What are pre conditionings? What is their source?

पूर्व-मान्यताएं क्या हैं? उनका स्रोत क्या है?

ਪ੍ਰਰਬ-ਮਾਨਤਾਵਾਂ ਕੀ ਹਨ? ਉਨ੍ਹਾਂ ਦਾ ਸਰੋਤ ਕੀ ਹੈ?

[M-93322]

[M- 93322]

(S-17) 2142

4. Differentiate between intention and competence. How do we come to confuse between the two?

इरादा और क्षमता के बीच क्या अंतर है? कैसे हम गलती करते हैं?

ਇਰਾਦਾ ਅਤੇ ਸਮਰੱਥਾ ਦੇ ਵਿੱਚ ਕੀ ਅੰਤਰ ਹੈ? ਕਿਵੇਂ ਅਸੀਂ ਗਲਤੀ ਕਰਦੇ ਹਾਂ?

5. What do you mean by your natural acceptance? Illustrate with examples. Is it invariant with the time and place?

आपकी स्वाभाविक स्वीकृति से आपका क्या अभिप्राय है? उदाहरण सहित स्पष्ट कीजिए। क्या यह समय और स्थान के साथ अपरिवर्तनीय है?

ਤੁਹਾਡੀ ਕੁਦਰਤੀ ਸਵੀਕ੍ਰਿਤੀ ਤੋਂ ਤੁਹਾਡਾ ਕੀ ਮਤਲਬ ਹੈ? ਉਦਾਹਰਣਾਂ ਨਾਲ ਸਮਝਾਓ। ਕੀ ਇਹ ਸਮੇਂ ਅਤੇ ਸਥਾਨ ਨਾਲ ਬਦਲਦਾ ਹੈ?

6. "To be in a state of harmony is happiness". Examine the statement and illustrate it with two examples from your day-to-day life.

“सद्भाव की स्थिति में रहना खुशी है”। कथन की जाँच करें और इसे अपने दैनिक जीवन के दो उदाहरणों से स्पष्ट करें।

“ਇਕਸੁਰਤਾ ਦੀ ਸਥਿਤੀ ਵਿੱਚ ਰਹਿਣਾ ਖੁਸ਼ੀ ਹੈ”। ਕਥਨ ਦੀ ਜਾਂਚ ਕਰੋ ਅਤੇ ਇਸਨੂੰ ਆਪਣੇ ਰੋਜ਼ਾਨਾ ਜੀਵਨ ਵਿੱਚੋਂ ਦੋ ਉਦਾਹਰਣਾਂ ਦੇ ਨਾਲ ਸਮਝਾਓ।

SECTION-C

(6 × 5 = 30)

7. Right understanding + Relationship = Mutual fulfillment. Illustrate with two examples for each.

सही समझ + रिश्ता = पारस्परिक पूर्ति। प्रत्येक के लिए दो उदाहरणों के साथ उपरोक्त को स्पष्ट करें।

ਸਹੀ ਸਮਝ + ਰਿਸ਼ਤਾ = ਆਪਸੀ ਪੂਰਤੀ। ਹਰੇਕ ਲਈ ਦੋ ਉਦਾਹਰਣਾਂ ਦੇ ਨਾਲ ਉਪਰੋਕਤ ਨੂੰ ਦਰਸਾਓ।

8. How is a human-being co-existence of Self and Body? Explain Pre-Conditioning, Sensation and Natural-Acceptance.

इंसान स्वयं और शरीर का सह-अस्तित्व कैसे है? पूर्व-मान्यता, संवेदना और प्राकृतिक-स्वीकृति समझाओ।

ਮਨੁੱਖ ਸਵੈ ਅਤੇ ਸਰੀਰ ਦਾ ਸਹਿ-ਅਸਤਿਤਵ ਕਿਵੇਂ ਹੈ? ਪੂਰਵ-ਮਾਨਤਾ, ਸੰਵੇਦਨਾ ਅਤੇ ਸਹਿਜ-ਸਵਿਕਰਿਤੀ ਸਮਝਾਓ।

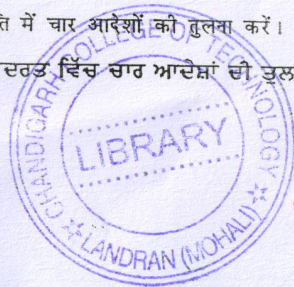
9. Compare the Four Orders in Nature on the basis of their salient aspects.

मुख्य पहलुओं के आधार पर प्रकृति में चार आदेशों की तुलना करें।

ਮੁੱਖ ਪਹਿਲੂਆਂ ਦੇ ਆਧਾਰ ਉੱਤੇ ਕੁਦਰਤ ਵਿੱਚ ਚਾਰ ਆਦੇਸ਼ਾਂ ਦੀ ਤੁਲਨਾ ਕਰੋ।

[M-93322]

(S-17) 2142



NOV 2025

10. Critically examine the state of society today in context with fulfillment of the comprehensive human goal.

व्यापक मानवीय लक्ष्य की पूर्ति के सन्दर्भ में आज समाज की स्थिति का आलोचनात्मक परीक्षण करें।

ਵਿਆਪਕ ਮਨੁੱਖੀ ਟੀਚੇ ਦੀ ਪੂਰਤੀ ਦੇ ਸੰਦਰਭ ਵਿੱਚ ਅੱਜ ਸਮਾਜ ਦੀ ਸਥਿਤੀ ਦੀ ਗੰਭੀਰਤਾ ਨਾਲ ਜਾਂਚ ਕਰੋ।

11. The problem today is that the desires, thoughts and expectations are largely set by pre conditionings or sensations. Examine this statement.

आज समस्या यह है कि इच्छाएँ, विचार और अपेक्षाएँ काफी हद तक पूर्व-स्थितियों या संवेदनाओं द्वारा निर्धारित होती हैं। इस कथन का परीक्षण करें।

ਅੱਜ ਸਮੱਸਿਆ ਇਹ ਹੈ ਕਿ ਇੱਛਾਵਾਂ, ਵਿਚਾਰਾਂ ਅਤੇ ਉਮੀਦਾਂ ਜ਼ਿਆਦਾਤਰ ਪੂਰਵ-ਸ਼ਰਤਾਂ ਜਾਂ ਸੰਵੇਦਨਾਵਾਂ ਦੁਆਰਾ ਨਿਰਧਾਰਤ ਕੀਤੀਆਂ ਜਾਂਦੀਆਂ ਹਨ। ਇਸ ਕਥਨ ਦੀ ਜਾਂਚ ਕਰੋ।

Note : Any student found attempting answer sheet from any other person(s), using incriminating material or involved in any wrong activity reported by evaluator shall be treated under UMC provisions.

Student found sharing the question paper(s)/answer sheet on digital media or with any other person or any organization/institution shall also be treated under UMC.

Any student found making any change/addition/modification in contents of scanned copy of answer sheet and original answer sheet, shall be covered under UMC provisions.

[M-93322]

(S-17) 2142

Roll No.

Total No. of Pages : 04

Total No. of Questions : 11

B.Com. (Hons) / B.Sc. (MLS / OTT) / BHMCT /

BCA / M.Com (Sem.-1,2)

HUMAN VALUES, DE-ADDICTION & TRAFFIC RULES

Subject Code : HVPE101-18

M.Code : 75087

Date of Examination : 07-01-2026

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. Section-A is compulsory TEN questions ONE mark each.
2. Section-B contains FIVE questions of FIVE marks each attempt any FOUR.
3. Section-C contains FIVE questions with internal choice of SIX marks each attempt all.

SECTION-A

(10×1=10)

1. Write briefly :

- a) What is Value-Education?
मूल्य-शिक्षा क्या है?
मूल-सिंधिआ की है?
- b) What do you mean by Respect?
आप का सम्मान से क्या मतलब है?
तुहाडा आदर तों की मउलब है?
- c) What is Gratitude?
कृतज्ञता क्या है?
क्रिउगिअता की है?
- d) What is innateness?
स्वाभाविकता क्या है?
सवाभाविकता की है?
- e) What is Utility-Value?
उपयोगिता-मूल्य क्या है?
उपयोगिता-मूल की है?



NOV 2025

[M-75087]

(S-17) 2122

f) What is value of any unit in the larger order?

बड़े आदेश में किसी भी इकाई का क्या मूल्य है?

बड़े आदेश में किसकी वी इकाई का की मूल है?

g) What is Perseverance?

अटलता क्या है?

धीरज की है?

h) Explain Natural Acceptance.

सहज स्वीकृति समझाओ।

बुद्धि मंजुरी समझाओ।

i) What is Mutual Fulfilment?

पारस्परिक पूर्ति क्या है?

आपस की पूर्ति की है?

j) What is Holistic System?

समग्र प्रणाली क्या है?

समग्रबोधक प्रणाली की है?

SECTION-B

(5 × 4 = 20)

2. How do you presently decide what is valuable to you ? How do you ensure that your decision is right?

आप वर्तमान में यह कैसे तय करते हैं कि आपके लिए क्या मूल्यवान है? आप यह कैसे सुनिश्चित करते हैं कि आपका निर्णय सही है?

तुसीं इस वेले इह किवें फैसला करदे हों कि तुहाडे लखी की कीमती है? तुसीं इह किवें जकीनी बटाओदे हों कि तुहाडा फैसला सही है?

3. What is the difference between 'animal consciousness' and the 'human consciousness'. Explain with the help of a diagram.

'पशु चेतना' और 'मानव चेतना' में क्या अंतर है? चित्र की सहायता से समझाइये।

'पशु चेतना' अउ 'मनुष्यी चेतना' में की अंतर है? चित्र की मदद नाल दिखाइये।

[M-75087]

(S-17) 2122

4. Differentiate between intention and competence. How do we come to confuse between the two?

इरादा और क्षमता के बीच क्या अंतर है? कैसे हम गलती करते हैं?

ਇਰਾਦਾ ਅਤੇ ਸਮਰੱਥਾ ਦੇ ਵਿੱਚ ਕੀ ਅੰਤਰ ਹੈ? ਕਿਵੇਂ ਅਸੀਂ ਗਲਤੀ ਕਰਦੇ ਹਾਂ?

5. Explain Competence in Professional-Ethics.

ਪੇਸ਼ੇਵਰ ਨੈਤਿਕਤਾ में कृषमता समझाओ।

ਪੇਸ਼ੇਵਰ ਨੈਤਿਕਤਾ ਵਿੱਚ ਸਮਰੱਥਾ ਸਮਝਾਓ।

6. Why is it important to study yourself? How does it help in your day-to-day life?

स्वयं का अध्ययन करना क्यों महत्वपूर्ण है? यह आपके दैनिक जीवन में कैसे मदद करता है?

ਆਪਣੇ ਆਪ ਦਾ ਅਧਿਐਨ ਕਰਨਾ ਮਹੱਤਵਪੂਰਨ ਕਿਉਂ ਹੈ? ਇਹ ਤੁਹਾਡੇ ਰੋਜ਼ਾਨਾ ਜੀਵਨ ਵਿੱਚ ਕਿਵੇਂ ਮਦਦ ਕਰਦਾ ਹੈ?

SECTION-C

(05 × 06 = 30)

7. What are the five dimensions of human endeavor in society?

समाज में मानव प्रयास के पांच आयाम क्या हैं?

ਸਮਾਜ ਵਿੱਚ ਮਨੁੱਖ ਕੋਸ਼ਿਸ਼ ਦੇ ਪੰਜ ਪਹਿਲੂ ਕੀ ਹਨ?

OR

What do you understand by the value of an entity? What is the value of a human being?

किसी इकाई के मूल्य से आप क्या समझते हैं? एक इंसान की कीमत क्या है?

ਤੁਸੀਂ ਕਿਸੇ ਹਸਤੀ ਦੇ ਮੁੱਲ ਦੁਆਰਾ ਕੀ ਸਮਝਦੇ ਹੋ? ਮਨੁੱਖ ਦੀ ਕੀ ਕੀਮਤ ਹੈ?

8. What is the natural characteristic of a unit? Elaborate on the natural characteristic of human road.

किसी इकाई की प्राकृतिक विशेषता क्या है? मानव व्यवस्था की प्राकृतिक विशेषता पर विस्तार से चर्चा करें

ਇਕ ਇਕਾਈ ਦੀ ਕੁਦਰਤੀ ਵਿਸ਼ੇਸ਼ਤਾ ਕੀ ਹੈ? ਮਨੁੱਖੀ ਕ੍ਰਮ ਦੀ ਕੁਦਰਤੀ ਵਿਸ਼ੇਸ਼ਤਾ ਬਾਰੇ ਵਿਸਤ੍ਰਿਤ ਕਰੋ।

OR

How is a human-being co-existence of Self and Body? Explain Pre-conditioning, Sensation and Natural-Acceptance.

इंसान स्वयं और शरीर का सह-अस्तित्व कैसे है? पूर्व-मान्यता, संवेदना और प्राकृतिक-स्वीकृति समझाओ।

ਮਨੁੱਖ ਸਵੈ ਅਤੇ ਸਰੀਰ ਦਾ ਸਹਿ-ਅਸਤਿਤਵ ਕਿਵੇਂ ਹੈ? ਪੂਰਵ-ਮਾਨਤਾ, ਸੰਵੇਦਨਾ ਅਤੇ ਸਹਿਜ-ਸਵਿਕਰਿਤੀ ਸਮਝਾਓ।

9. Describe in brief the salient values in human relationships.

मानवीय रिश्तों में संक्षिप्त मुख्य मूल्यों का विवरण दें।

ਮਾਨਵੀ ਰਿਸ਼ਤਿਆਂ ਵਿੱਚ ਸੰਖੇਪ ਮੁੱਖ ਮੁੱਲਾਂ ਦਾ ਵਰਨਣ ਕਰੋ।

OR

What do you mean by Universal Human Order? What could be your role in moving towards it?

आप सार्वभौमिक मानवीय आदेश से क्या समझते हैं? इसमें अपनी भूमिका क्या हो सकती है?

ਤੁਸੀਂ ਸਾਰਵਭੌਮਿਕ ਮਾਨਵੀ ਆਦੇਸ਼ ਵਲੋਂ ਕੀ ਸਮਝਦੇ ਹੋ? ਇਸ ਵਿੱਚ ਆਪਣੀ ਭੂਮਿਕਾ ਕੀ ਹੋ ਸਕਦੀ ਹੈ?

10. What are the unethical practices in the profession at present? Analyze the root cause and possible solution.

मौजूदा समय में पेशे के मुख्य अनैतिक तरीके क्या हैं? मूल कारण और संभव समाधान का विश्लेषण करें।

ਮੌਜੂਦਾ ਸਮਾਂ ਵਿੱਚ ਪੇਸ਼ੇ ਦੇ ਮੁੱਖ ਅਨੈਤਿਕ ਤਰੀਕੇ ਕੀ ਹਨ? ਮੂਲ ਕਾਰਨ ਅਤੇ ਸੰਭਵ ਸਮਾਧਾਨ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰੋ।

OR

Draw the chart showing in detail, the different categories of units of nature in coexistence in space. What is your role in existence?

अंतरिक्ष में सह-अस्तित्व में प्रकृति की इकाइयों की विभिन्न श्रेणियों को विस्तार से दर्शाने वाला चार्ट बनाएं। अस्तित्व में आपकी क्या भूमिका है?

ਪੁਲਾੜ ਵਿੱਚ ਸਹਿ-ਹੋਂਦ ਵਿੱਚ ਕੁਦਰਤ ਦੀਆਂ ਇਕਾਈਆਂ ਦੀਆਂ ਵੱਖ-ਵੱਖ ਸ਼੍ਰੇਣੀਆਂ ਨੂੰ ਵਿਸਤਾਰ ਵਿੱਚ ਦਿਖਾਉਂਦੇ ਹੋਏ ਚਾਰਟ ਬਣਾਓ। ਹੋਂਦ ਵਿੱਚ ਤੁਹਾਡੀ ਕੀ ਭੂਮਿਕਾ ਹੈ?

11. List some of the specific criteria for holistic evaluation of technologies. Elaborate any two of them.

प्रौद्योगिकियों के समग्र मूल्यांकन के लिए कुछ विशिष्ट मानदंडों की सूची बनाएं। उनमें से किन्हीं दो पर विस्तार से प्रकाश डालिए।

ਤਕਨਾਲੋਜੀਆਂ ਦੇ ਸੰਪੂਰਨ ਮੁਲਾਂਕਣ ਲਈ ਕੁਝ ਖਾਸ ਮਾਪਦੰਡਾਂ ਦੀ ਸੂਚੀ ਬਣਾਓ। ਇਹਨਾਂ ਵਿੱਚੋਂ ਕਿਸੇ ਦੇ ਬਾਰੇ ਵਿਸਤਾਰ ਵਿੱਚ ਦੱਸੋ।

OR

What do you mean by conformance? Explain the conformance in the four orders.

अनुरूपता से आप क्या समझते हैं?

ਅਨੁਰੂਪਤਾ ਤੋਂ ਤੁਹਾਡਾ ਕੀ ਮਤਲਬ ਹੈ? ਚਾਰ ਆਦੇਸ਼ਾਂ ਵਿੱਚ ਅਨੁਰੂਪਤਾ ਦੀ ਵਿਆਖਿਆ ਕਰੋ।

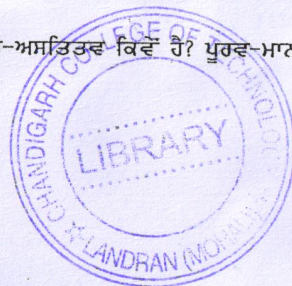
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NOV 2025

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (Sem.-2)
PHYSICAL CHEMISTRY
Subject Code :BSBT-201-18
M.Code :75872

Date of Examination:09-12-2025

Time : 3 Hrs.

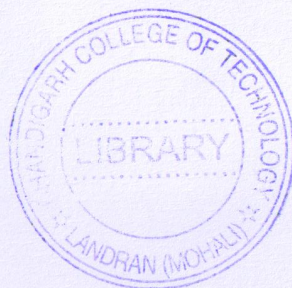
Max. Marks : 60

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 mean by internal energy?
 - b) What do you mean by heat capacity?
 - c) Explain the molar conductance.
 - d) Explain second law of Thermodynamics.
 - e) Define the Enthalpy.
 - f) What do you mean by order?
 - g) Explain the phase rule.
 - h) Define the intensive properties.
 - i) Define the degree of freedom.
 - j) Explain the buffer solutions.



SECTION – B

2. Explain the Nernst heat theorem.
3. Derive the first law of thermodynamics.
4. What are conductometric titration and its types?
5. Why there is need of second law of thermodynamics?
6. Explain the phase equilibrium of water system.

SECTION - C

7. Derive the Clausius-Clapeyron equation.
8. What are the applications of Hess's law?
9. Explain the rate equation of 1st order reaction.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc.(BT) (Sem.-2)

INTRODUCTION TO MICROBIOLOGY

Subject Code : BSBT-202-18

M.Code : 75873

Date of Examination : 11-12-2025

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 limit of resolution and numerical aperture.
- b) Explain the principle of dark field microscopy.
- c) Difference between Gram-positive and Gram-negative bacteria.
- d) Discuss morphological characteristics of bacterial viruses.
- e) Explain the sterilization of media by heat.
- f) Difference between biogenesis and abiogenesis.
- g) Explain sporulation.
- h) Explain applications of bright field microscopy.
- i) Define monoauxic and diauxic growth.
- j) Discuss the importance of quantitative measurement of growth.

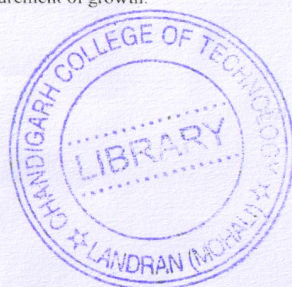
SECTION - B

2. Explain the working, principle and applications of SEM.
3. Discuss the host defense mechanism against pathogens.
4. Explain the importance, distinguishing characteristics, morphology and reproduction mode of fungi.
5. Discuss the contribution of Antony van Leeuwenhoek, Joseph Lister and John Tyndall in the historic development of microbiology.
6. Discuss the production of heterologous proteins in microbes.

SECTION - C

7. Discuss symbiosis and antibiosis in detail.
8. What is steady-state growth and what advantages does it offer? Describe how Steady-state growth at a certain rate could be obtained by use of a chemostat?
9. Define sterilization. Discuss the various physical and chemical agents to kill microbes.

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NOV 2025

Roll No.

Total No. of Pages :02

Total No. of Questions : 09

B.Sc. (BT) (Sem.-2)

BIostatISTICS

Subject Code : BSBT-203-18

M.Code : 75874

Date of Examination : 13-12-2025

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 briefly:

- a) What is the difference between Relative Frequency and Probability?
- b) What is Statistical Population and Sample?
- c) What is meant by a Test of Significance?
- d) Define the term 'Level of Significance'.
- e) Define Biostatistics.
- f) What do you mean by Matrix Manipulation?
- g) Write key features, advantages and disadvantages of Tabular Presentation of Data.
- h) Draw Pie Chart of total number of species in the ecosystem as given below:

Species	No. of types
Insects	17
Plants	16
Birds	9
Amphibians	8

- i) What is the need for Curve Smoothing?
- j) What are the benefits of Randomization in Design of Experiments?

SECTION-B

2. Distinguish between Normal, Binomial and Poisson Distribution.
3. Compute mean and standard deviation of following frequency distribution:

X	20-30	30-40	40-50	50-60	60-70	70-80	80-90
f	3	61	132	153	140	51	2

4. Explain different rules for evaluation of 3×3 determinants.
5. What are First and Second Derivative Curves? Give their applications.
6. What is the significance of Residual Analysis? Write in brief about Z-residual.

SECTION-C

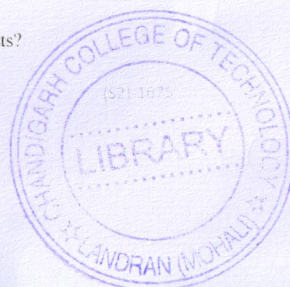
7. Describe Simpson's and Trapezoidal rule of numerical integration? Discuss their applications in the field of biotechnology.
8. a) Differentiate between One-way and two-way Analysis of Variance.
b) One bacterium was grown in broth culture at 3 different pH levels at 4 different temperatures. The growth was measured by optical density as shown in the table.

Temperature ($^{\circ}\text{C}$)	pH 5.5	pH 6.5	pH 7.5
25	10	19	40
30	15	25	45
35	20	30	55
40	15	22	40

Analyze statistical significance among different temperatures and pH.

9. a) Describe types of Replication in Design of Experiments. Give their advantages and disadvantages.
b) Describe key characteristics, benefits and limitations of Completely randomized design.

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NOV 2025

Roll No.

Total No. of Pages : 02

Total No. of Questions : 07

B.Com (Hons) / BA(JAMC) / BHMCT / B.Sc.(BT) /
FD / MLS / BBA / BTM (Sem.-2)

ENVIRONMENTAL STUDIES

Subject Code : EVS-102-18

M.Code : 75831

Date of Examination : 18-12-2025

Time : 3 Hrs.

Max. Marks : 60

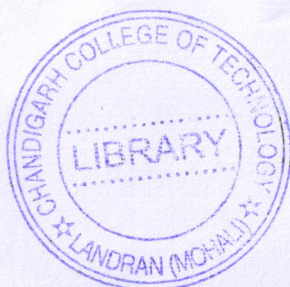
INSTRUCTIONS TO CANDIDATES :

1. Attempt ALL questions in SECTION-A, Each question carry 2 marks.
2. Attempt any FOUR questions from SECTION-B, Each question carry 10 marks.

SECTION-A

1. Answer briefly :

- a) Biodiversity
- b) Renewable energy
- c) Air pollution
- d) Ecosystem
- e) Reason of deforestation
- f) Climate change
- g) Global warming
- h) Causes of floods
- i) Noise Pollution
- j) Sources of water pollution



NOV 2025

SECTION - B

2. Discuss the types, causes and effects of Soil pollution.
3. What are global environmental hazards? Discuss their major causes and preventive measures with examples.
4. Discuss the importance of natural resources. Compare renewable and non-renewable resources and suggest ways to conserve them.
5. Explain the concept of natural disasters. Discuss the causes, effects and management strategies for such disasters.
6. Define the ecosystem and briefly explain its structure and functions.
7. Write a short note on Forest Conservation Act.

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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:24-11-2025

Time : 3 Hrs.

Max. Marks : 60

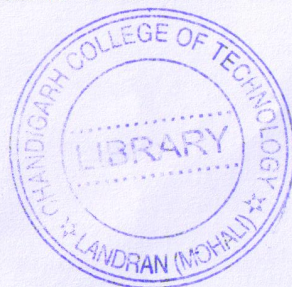
INSTRUCTIONS TO CANDIDATES :

- 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:

- Draw structure of chromatin fiber.
- Properties of genetic code.
- Physical mutagens.
- Role of helicase and topoisomerase in replication.
- Leading and Lagging Strand.
- Introns and exons.
- Structure of tRNA.
- Inducer of lac operon and its function.
- Pribnow box and its role in transcription.
- What is a polysome in prokaryotes and what does its formation indicate?



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NOV 2025

SECTION - B

2. Discuss structure and functions of nucleosome with well labeled diagram.
3. Define mutagens. Discuss various chemical mutagens inducing mutations.
4. Discuss the role of ribosomes in translation.
5. Describe the role of promoter, operator, structural and regulatory genes in operon.
6. Describe RNA polymerase. Give its types and functions in transcription cycle.

SECTION - C

7. Describe the process of transcription in prokaryotes.
8. Describe structure of Lac operon. Discuss its regulation in both positive and negative mode.
9. **Write short notes on the following :**
 - a) Enzymes involved in prokaryotic replication.
 - b) Photo-reactivation

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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT)(Sem.-3)

IMMUNOLOGY

Subject Code : BSBT-302-18

M.Code : 76609

Date of Examination :20-11-2025

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) Louis Pasteur
- b) Adaptive immunity
- c) Polymorphs
- d) Function of Spleen
- e) Paratope
- f) Avidity
- g) IgM
- h) C5 convertase
- i) T_H2 cell function.
- J) MALT

SECTION - B

2. Differentiate between specific and non specific immune response.
3. Discuss the role of secondary lymphoid organs.
4. Describe molecular mechanism of generation of antibody diversity.
5. What is complement cascade? Discuss in detail alternative pathway of complement activation.
6. Discuss the mechanism of T independent antigen recognition.

SECTION - C

7. Discuss structure and function of primary lymphoid organs.
8. Draw structure of various classes of antibodies. Explain their functions.
9. Explain in detail the structure and function of class MHC class II molecules.

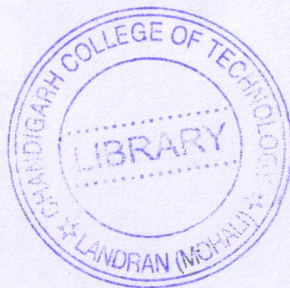
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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT)(Sem.-3)
INTRODUCTION TO COMPUTERS
Subject Code :BSBT-307-18
M.Code :76614
Date of Examination:27-11-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

- 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. Answerbriefly:

- a) ROM
- b) CD vs DVD
- c) Cache
- d) Plotter
- e) NCBI data model
- f) ALU
- g) Analogue Computer
- h) Keyboard
- i) Hardware
- j) Monitor

SECTION-B

2. Differentiate between analogue and digital computers.
3. Write a note on stored programs.
4. Discuss briefly about mass storage devices.
5. Describe any 3 input devices.
6. What are biological databases? Explain.

SECTION-C

7. Write a detailed note on Phylogenetic analysis and Protein structures.
8. Discuss with the help of diagram any 4 input devices.
9. Explain in detail magnetic tape and magnetic disks data representation.

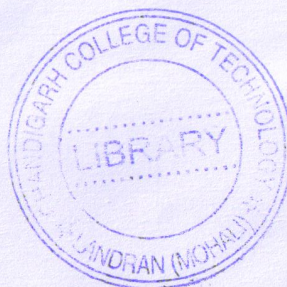
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Nov 2025

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 :18-11-2025

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 mean by Inductive effect?
- b) Define the term nucleophile.
- c) Define the term free radical.
- d) What do you mean by the alkanes?
- e) Define the term of reaction intermediates.
- f) What do you mean by cycloalkane?
- g) What is the Hyper-conjugation?
- h) Explain the term aromatic nucleus.
- i) What do you mean by resonance?
- j) What do you mean by physical properties of phenol?

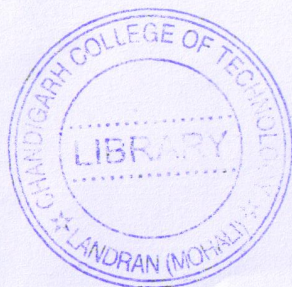
SECTION-B

2. Explain the chemical properties of alkynes.
3. Explain the formation of cycloalkane.
4. What are Singlet and triplet carbene?
5. What are reaction intermediates?
6. What are the physical and chemical properties of alkenes?

SECTION-C

7. Explain the Reimer-Tiemann reaction with mechanism.
8. What are the Carboanion and its properties?
9. Explain the physical and chemical properties of phenol.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc.(BT)(Sem.-4)
GENETIC ENGINEERING

Subject Code : BSBT401-18

M.Code : 77690

Date of Examination:06-12-2025

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) Differentiate between high-copy and low-copy plasmids.
- b) What are episomal expression vectors and how are they used in plants?
- c) Define molecular pharming and mention one of its key applications.
- d) What is the role of the T-DNA region present in the Ti plasmid?
- e) How can antibiotic resistance genes act as selectable markers in cloning experiments?
- f) What are embryonic stem cells?
- g) What is chromosome jumping and what is its purpose?
- h) Which type of cells are usually chosen for microinjection and why?
- i) What genetic modification led to the extended shelf life of the Flavr Savr tomato?
- j) Explain the concept of blue white screening for identifying recombinant colonies.

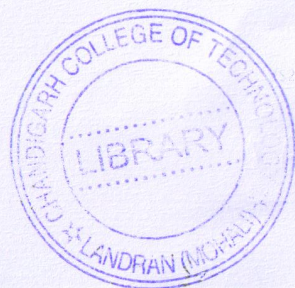
SECTION-B

2. Describe the process of bacterial conjugation and explain its role in genetic exchange.
3. Explain the mechanism of transduction in bacteria. How do generalized and specialized transductions differ?
4. Define plasmids and describe their types, examples and applications in biotechnology.
5. What are direct methods of gene transfer in plants? Explain any two in detail.
6. Write short notes on Electroporation, Ultrasonication and Microlaser.

SECTION-C

7. Explain in detail the principles and methods involved in protein engineering, highlighting key applications.
8. Discuss the techniques and Importance of plant genetic engineering, giving relevant examples.
9. Write an elaborate note on site-directed mutagenesis and its applications.

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NOV 20 25

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 : 09-12-2025

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) Aseptic manipulation
- b) Cellular Totipotency
- c) Surface sterilization
- d) Unidentified supplements
- e) Callus culture
- f) HAT
- g) Hybrid clone
- h) Organ culture
- i) Monoclonal antibodies
- j) Name two vitamins used in PTC.



NOV 2025

SECTION-B

2. Discuss in brief laboratory organization for plant tissue culture.
3. Explain the concept of somatic embryogenesis.
4. Describe the role of various hormones in plant tissue culture.
5. What is the importance of selecting different media for plant tissue culture?
6. Discuss the method of plant micro-propagation?

SECTION-C

7. Discuss the methodologies used in plant tissue culture technique.
8. Discuss the role of various plant growth hormones in plant tissue culture.
9. What are clones? Discuss in detail the concept of cloning.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc.(Biotechnology)(Sem.-4)
INDUSTRIAL BIOTECHNOLOGY

Subject Code : BSBT-403-18

M.Code : 77692

Date of Examination:11-12-2025

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) Malting
- b) Wine flowers
- c) Biosafety levels
- d) Metabolic pathway
- e) Biofuels
- f) Sterilization
- g) Role of media in microbial fermentations.
- h) Name five microorganisms used as bio-fertilizers.
- i) Homo-fermentation and Hetero-fermentation reactions.
- j) Hops



NOV 2025

SECTION -B

2. Describe the limitations of bio-fertilizers.
3. Discuss the industrial uses of yeasts.
4. What is the role of chaptalization and amelioration in wine making?
5. Describe various factors affecting the large-scale fermentations.
6. Differentiate between beer, wine and whisky.

SECTION -C

7. Describe the scope and applications of environmental biotechnology with examples.
8. Describe the process of beer making with the help of flow chart.
9. Discuss various upstreaming and down streaming steps for the microbial production of any one antibiotics.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT)(Sem.-4)

ANALYTICAL TECHNIQUES IN BIOTECHNOLOGY

Subject Code :BSBT407-18

M.Code :77696

Date of Examination : 13-12-2025

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 :

- Explain Raman effect.
- Write the applications of paper chromatography.
- Discuss the various applications of gel permeation chromatography.
- Explain in brief various applications of PAGE.
- Discuss the principle of rate-zonal centrifugation.
- Write a short note on autoradiography.
- Discuss theory of electrophoresis.
- Define chemical shift.
- Write a short note on molecular polarizability.
- Explain Beer - Lambert law.

SECTION-B

2. Define chromatography. Explain the principle, working and applications of HPLC.
3. Explain the basic principle of NMR spectroscopy. What kind of information can be obtained from NMR spectrum?
4. What is fluorescence microscopy? Explain its working principle and applications.
5. What is SDS-PAGE? Discuss its principle and mention applications.
6. Discuss adsorption chromatography in detail. Also, highlight its principle, limitations and advantages.

SECTION-C

7. Describe the principle and procedure of TLC. Explain the roles of stationary phase and mobile phase in the separation of compounds. How is the Retention factor (Rf) calculated and what factors influence it?
8. Explain western blotting. Describe its principle, steps involved and applications.
9. What is centrifugation? Explain its principle, types and applications in biological research.

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NOV 2025

Roll No.

Total No. of Pages : 02

Total No. of Questions : 11

B.Sc. (BT)(Sem.-5)

BIOTECHNOLOGY IN FORENSIC SCIENCE

Subject Code : BSBT142-18

M.Code : 78353

Date of Examination : 02-12-2025

Time : 3 Hrs.

Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of EIGHT questions carrying TWO marks each.
2. SECTION-B contains EIGHT questions carrying FOUR marks each and students have to attempt any SIX questions.
3. SECTION-C is COMPULSORY contains TWO questions with internal choice carrying TEN marks each.

SECTION-A

1. Write briefly :

- Define forensic science.
- Forensic ballistics
- Tramline bruise
- Composite patterns
- Stereomicroscope
- Law of comparison.
- Define firearm.
- Pen pressure

SECTION - B

2. Discuss law of probability. Cite a suitable example.
3. Discuss the role of toxicologist and significance of toxicological findings.

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4. Discuss fundamental principles of fingerprints.

5. Define computer forensics. Write a note on investigative tools used in computer forensics.
6. How two handwriting samples are compared? Explain the procedure.
7. Explain the terms: Internal Ballistics and Terminal Ballistics.
8. Write a note on Modus operandi.
9. Discuss various causes of crime in India.

SECTION - C

10. Discuss the various branches of forensic science laboratories in India.

OR

Discuss the development of fingerprint as science for personal identification.

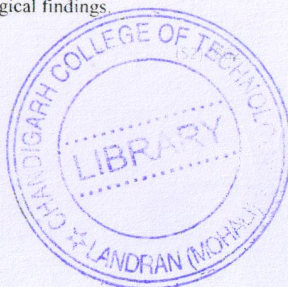
11. What are explosives? Discuss the classification of explosives along with examples.

OR

Discuss the various tools and techniques used in forensic science for sample analysis.

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2 | M-78353



Nov 2025

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (BT)(Sem.-5)
ANIMAL BIOTECHNOLOGY
Subject Code :BSBT139-18
M.Code : 78350
Date of Examination :27-11-2025

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 TWO & HALF ($2\frac{1}{2}$) 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) Microinjection
- b) Gene transfers
- c) Embryonic stem cell
- d) Theileriosis
- e) Conservation biology
- f) Artificial insemination
- g) Germline gene therapy
- h) Human genetic engineering
- i) Name two vectors used in gene therapy
- j) Coccidiosis

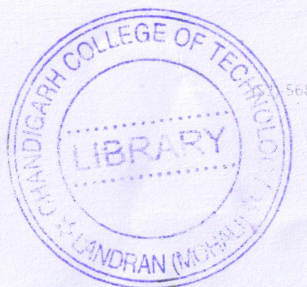
SECTION - B

2. Explain the role of retroviruses in gene transfer.
3. How can we treat foot and mouth disease using Biotechnology?
4. Describe the procedure to make animal clones.
5. What is embryo transfer technique?
6. What are ethical issues associate with gene modification?

SECTION - C

7. What is transgenesis? How are transgenic animals produced?
8. What is stem cell technology? Writedown its various applications.
9. What is gene therapy? Explain the role of gene therapy in treating diseases?

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NOV 2025

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT)(Sem.-5)

ORGANIC FARMING

Subject Code :BSBT501-18

M.Code : 78346

Date of Examination : 18-11-2025

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) Organic farming
- b) Vermiwash
- c) Fukuoka farming
- d) Bio-rationales
- e) Organic manure
- f) Natural farming
- g) NADEP Compost
- h) Soil health
- i) Soil enzymes
- j) Sewage and sludge

SECTION - B

2. Write down significance of organic farming.
3. What do you know about bio-remediation and phytoremediation?
4. Discuss the role of micro-organisms in pesticides degradation.
5. Discuss the Biodynamic agriculture.
6. Write a short note on biological tests.

SECTION - C

7.
 - a) Write down the advantages and disadvantages of organic agriculture.
 - b) Discuss in detail about organic farming for sustainable agriculture.
8.
 - a) Define bio-fertilizers. Explain its different types. Write down various advantages and disadvantages of bio-fertilizers.
 - b) Write down the procedure of microbial inoculation. Write down names, dose, method of application/inoculation of different bio-fertilizers recommended for cereals, pulses, fodder crops, sugarcane, turmeric, potato.
9.
 - a) Differentiate green manuring and hedgerows. Write down characteristics of green manure crop. How can you raise a green manuring crop. Write down important instructions regarding incorporation of green manure crop before maize sowing and rice transplanting.
 - b) Discuss the quality parameters of organic manures and their specifications.

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Nov 2025

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Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT) (Sem.-5)
HUMAN BEHAVIOUR & PSYCHOLOGY

Subject Code : BSBT-137-18

M.Code : 78348

Date of Examination : 20-11-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

- 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 the features of psychology.
 - b) What is experimental psychology?
 - c) What do you understand by sensory processes?
 - d) Differentiate between intrinsic & extrinsic motivation.
 - e) What are the basic emotions of human beings?
 - f) What are psychological tests?
 - g) Differentiate between introvert & extrovert personality.
 - h) What is dysfunctional conflict?
 - i) What is the importance of individual differences?
 - j) What is operant conditioning?

SECTION - B

2. Explain the scope of psychology.
3. Explain conflict handling mechanism.
4. Explain any two models of intelligence.
5. Explain the physiological correlates of emotions.
6. What are the methods of personality assessment?

SECTION-C

7. Discuss the various theories of learning.
8. Explain the various models of memory.
9. Explain the determinants of personality.



NOV 2025

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Total No. of Pages : 02

Total No. of Questions : 09

Bachelor of Science (Bio Technology) (Sem.-5)

RENEWABLE ENERGY RESOURCES

Subject Code :BSBT138-18

M.Code :78349

Date of Examination :24-11-2025

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 meant by Bio-fouling?
 - b) What is the difference between altitude angle and incident angle?
 - c) Draw the electrical equivalent of a single solar PV cell.
 - d) What is the difference between biomass and biogas?
 - e) Why is orientation needed in concentrating type collectors?
 - f) What are the lift and drag forces on the blade when wind flows over it?
 - g) What is the thermal gasification of biomass?
 - h) What is the function of heat carrier fluid in a geothermal system?
 - i) What are the various limitations of magnetohydrodynamic (MHD) systems?
 - j) Why do high-temperature geothermal power plants use steam turbines as the prime movers?



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NOV 2025

SECTION-B

2. Derive the equation for solar energy balance equation and collector efficiency their advantages and limitations.
3. How are solar collectors classified? What are the main applications of a drier?
4. What is meant by anaerobic digestion? What are the factors that effect bio-digestion? Explain briefly.
5. A tidal power plant of the simple single basin type has a basin area of $30 \times 10^6 \text{ m}^2$. The tide has a range of 12m. The turbine, however, stops operating when the head on it falls below 3m. Calculate the energy generated in 1 filling (or emptying) process in kWh if the turbine generator efficiency is 0.73.
6. What are the advantages and limitations of a thermionic converter?

SECTION-C

7. Describe with a neat sketch the working of a wind energy system with main components.
8. State the various factors to be considered while designing the biogas plant. Why is pretreatment essential before biogas production?
9.
 - a) Explain the working principle of a magnetohydrodynamic (MHD) generator.
 - b) Explain the aerodynamic forces acting on windmill blades. Give the classification of rotors used for wind power generation.

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Total No. of Pages : 02

Total No. of Questions : 09

Bachelor of Science (Biotechnology) (Sem.-5)
IPR, ENTREPRENEURSHIP BIOETHICS & BIOSAFETY

Subject Code :BSBT-141-18

M.Code :78352

Date of Examination : 02-12-2025

Time : 3 Hrs.

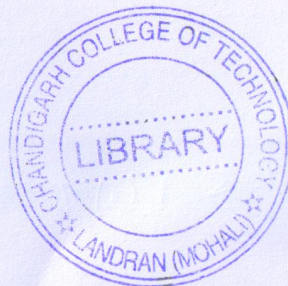
Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
2. SECTION-B contains FIVE questions carrying TWO & 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 patentability?
 - b) Name one international agreement linked to intellectual property.
 - c) What is the meaning of industrial property?
 - d) Define "stocking" in entrepreneurship.
 - e) What does "export potential" mean?
 - f) Give one example of a constraint in biotech production.
 - g) What does the term "ethical dilemma" mean?
 - h) Name one international ethical guideline related to molecular biology.
 - i) Define containment.
 - j) What does GLP stand for?



SECTION-B

2. Briefly describe the economic considerations of patenting a biotech product.
3. List and explain the key aspects of product design and development in biotechnology.
4. How does market demand impact biotech entrepreneurship?
5. What are the major ethical issues concerning molecular technologies?
6. Outline the major health hazards linked with biotechnology practices.

SECTION-C

7. Explain the global landscape of intellectual property rights (IPR) and how WTO has influenced patent law in biotechnology?
8. Analyze the economic and logistical challenges an entrepreneur may face when launching a new biotech product.
9. Discuss the necessity of bioethics in today's biotechnology field, citing international practices and concerns around molecular tools.

NOV 2025

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Bio Technology) (Sem-6)

DEVELOPMENTAL BIOLOGY

Subject Code :BSBT-147-18

M.Code :79458

Date of Examination :28-11-2025

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) Spermatogenesis
- b) Extension
- c) Convergence
- d) Fate maps
- e) Determination
- f) Celllineage
- g) Epigenetic landscape model
- h) Induction
- i) Neurulation
- j) Organogenesis



NOV 2025

SECTION-B

2. Discuss the scope and historical perspective of developmental biology.
3. Explain different types of fertilization.
4. Describe the mechanism of Blastulation.
5. Describe in brief the process of neural induction.
6. Explain the role of constancy and plasticity in development of behaviours.

SECTION-C

7. What is Gastrulation? Discuss the mechanism of Gastrulation.
8. Describe the concept of primary, secondary and tertiary embryonic induction.
9. What are germ layers? Discuss the fate of different primary germ layers.

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Roll No.

Total No. of Pages : 02

Total No. of Questions :09

B.Sc. (BT) (Sem.-6)

BIOTECHNOLOGY & HUMAN WELFARE

Subject Code :BSBT 148-18

M.Code : 79459

Date of Examination : 01-12-2025

Time : 3 Hrs.

Max. Marks :60

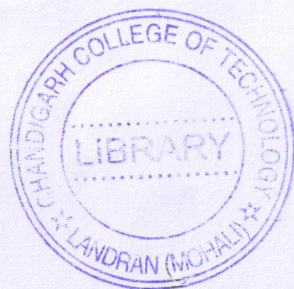
INSTRUCTIONS TO CANDIDATES :

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 :
- Name two micro-organisms that can fix atmospheric nitrogen.
 - How biotechnology plays important role in human welfare?
 - Define polysaccharides with examples.
 - Name one trait improved through qualitative livestock breeding.
 - Why is PHB considered as eco-friendly alternative to Conventional plastic?
 - What is the role of B-lymphocytes in monoclonal antibody production?
 - Discuss a commonly used method for breaking down chlorinated compounds.
 - Which technique is commonly used to analyze blood at a crime scene?
 - Write a short note on stress management.
 - Write a short note on gene therapy.

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Nov 2025

SECTION-B

2. Explain the methods and significance of transferring pest resistance genes to plants.
3. Discuss the various methods used for qualitative improvement of livestock. Also, highlight the benefits, challenges and future prospects of livestock improvement programs.
4. Discuss the strategies involved in the development of non-toxic therapeutic agents.
5. Explain the various types of diagnostic techniques used in biotechnology for human welfare.
6. Describe the role of forensic science in solving violent crimes and solving claims of paternity and theft.

SECTION-C

7. Explain the process of nitrogen fixation in detail. Describe the different types of nitrogen fixation, the role of microorganisms involved and the significance of this process in agriculture.
8. What are recombinant live vaccines? Explain the methods used in their development their advantages over traditional vaccines and provide examples of recombinant live vaccines used in human medicine.
9. Describe the role of protein engineering in the production of alcohols and antibiotics.

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2 | M-79459

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (BT)(Sem.-6)
MEDICAL MICROBIOLOGY

Subject Code :BSBT152-18

M.Code : 79463

Date of Examination :08-12-2025

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 & 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 :

- Name one DNA virus and one RNA virus.
- What is retrovirus? Give one example.
- What is septic shock?
- Mention methods used for diagnosis of *Bacillus anthracis*.
- Discuss nosocomial infections in brief.
- "Which biosafety level is used for working with viruses?" Justify your answer.
- Differentiate between endotoxins and exotoxins.
- How do pili or fimbriae contribute to bacterial pathogenicity?
- Mention two clinical signs of septicemia.
- Name causative agents of *Candidiasis* and *Giardiasis*.

SECTION - B

2. Discuss morphology, pathogenesis and symptoms caused by *Clostridium botulinum* along with their preventive measures.
3. Describe the pathogenesis, symptoms and preventive measures of infections caused by *Escherichia coli*.
4. Explain the mode of transmission, symptoms and prevention of poxviruses.
5. Write a detail note on opportunistic fungal infections.
6. Define systematic infections. Describe its characteristics and mention two systematic infections, including their causative organisms, modes of transmission and symptoms.

SECTION - C

7. Explain morphology, pathogenesis and symptoms caused by *H. influenzae* along with their laboratory diagnosis, preventive measures and chemotherapy.
8. What are blood-borne infections? Describe the pathogenesis, symptoms and preventive measures of Leishmaniasis and Malaria.
9. Explain the mode of transmission, symptoms and prevention of papova virus and picornavirus.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc (BT)(Sem.-6)
TECHNICAL WRITING
Subject Code :BSBT601-18
M.Code :79456

Date of Examination :26-11-2025

Time : 3 Hrs.

Max. Marks : 60

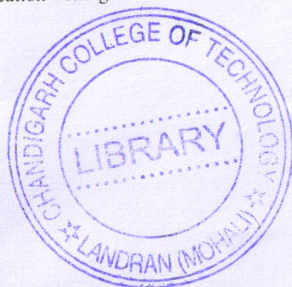
INSTRUCTIONS TO CANDIDATES :

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 technical writing?
- b. Mention two types of technical documents.
- c. Why is defining terms important in technical writing?
- d. What is the role of library resources in technical writing?
- e. Define proposal writing.
- f. What is the purpose of note-taking in technical writing?
- g. What are rough drafts and why are they important?
- h. What is technical writing style?
- i. Name two components of job application writing.
- j. Define plagiarism.



NOV 2025

SECTION - B

2. Define technical writing. Discuss any three characteristics that differentiate it from creative writing.
3. Explain the importance of persuasion in technical communication with relevant examples.
4. Describe the methods of collecting notes for technical writing purposes.
5. Discuss the significance of writing outlines before drafting a technical document.
6. Why plagiarism is considered unethical in academic and technical writing?

SECTION - C

7. What is audience analysis? Explain its types and significance in technical and professional communication. Provide real-world examples.
8. Write a job application for the post of senior scientists. Also, draft a resume.
9. Read the following passage and make notes :

Gender equality refers to the state in which individuals of all genders have equal rights, responsibilities, and opportunities in every aspect of life. Although significant progress has been made in recent decades, achieving full gender equality remains a challenge in many parts of the world. Women and girls often face discrimination in education, employment, healthcare and political representation. In many cultures, societal norms and traditional roles restrict women's participation in decision-making processes, both at home and in public life. On the other hand, men also face challenges due to rigid gender roles, such as being expected to suppress emotions or avoid certain careers deemed "feminine." Promoting gender equality benefits not just women, but society as a whole. Research shows that countries with higher gender equality experience faster economic growth, better health outcomes, and more inclusive governance. Education plays a critical role in addressing gender inequality. By teaching children about respect, empathy, and equal opportunities from an early age, societies can challenge harmful stereotypes. Legal reforms, awareness campaigns and the empowerment of women through education and employment are essential steps toward equality, social-media and global movements have also helped raise awareness about gender issues and inspired collective action. However, deep-rooted cultural attitudes still need to be addressed. True gender equality will be achieved only when both men and women are free to pursue their ambitions without facing discrimination or bias. It is a shared responsibility that requires continuous effort from individuals, institutions and governments worldwide.

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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 : 05-12-2025

Time : 3 Hrs.

Max. Marks : 40

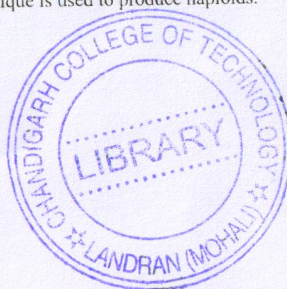
INSTRUCTIONS TO CANDIDATES :

- 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 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. Define the following :

- a) Organogenic differentiation
- b) Role of axillary bud proliferation in micro-propagation.
- c) Disadvantages of micro-propagation.
- d) Ploidy level
- e) Cereal crop where chromosome elimination technique is used to produce haploids.
- f) PEG
- g) Cybrids
- h) Cryopreservation
- i) Somaclonal variation
- j) Enzyme used for protoplast isolation.



NOV 2025

SECTION-B

2. Define cell suspension culture and mention how it differs from callus culture?
3. What is meristem culture and why is it used for producing virus-free plants?
4. Explain methods for identification of hybrid cells after protoplast fusion.
5. Define microspore culture and its advantages over another culture.
6. Define somatic hybridization and its limitations in detail.

SECTION-C

7. Differentiate between organogenesis and somatic embryogenesis. Describe their mechanisms and applications.
8. Explain the principles and methodology of another culture for haploid plant production. Discuss its applications and limitations.
9. Explain the process of biological nitrogen fixation. Discuss the roles of symbiotic and non-symbiotic micro-organisms.

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.

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc (Bio Technology) (Sem.-6)

BIOINFORMATICS

Subject Code :BSBT149-18

M.Code :79460

Date of Examination : 03-12-2025

Time : 3 Hrs.

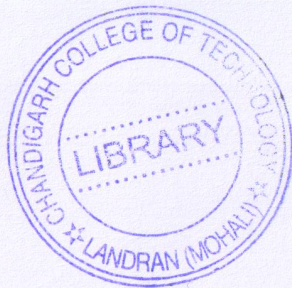
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SECTION-A

1. Write briefly :
- a) Gap penaltie
 - b) Data abstraction
 - c) Cladogram and Phylogram
 - d) Patterns
 - e) Literature database
 - f) Docking
 - g) GRAIL
 - h) Heuristic methods
 - i) Homology
 - j) Global alignment.



NOV 2025

SECTION - B

2. Elaborate on the use of Neural networks for protein structure prediction.
3. Describe the salient features of PDB database.
4. Explain BLAST algorithm. What are the applications of using BLAST?
5. What is the significance of sequence similarity and how does it differ from homology?
6. Describe briefly the Dot matrix method for pairwise sequence alignment.

SECTION - C

7. Discuss the Needleman-Wunsch algorithm for sequence alignment.
8. Elaborate on the different methods used for Multiple sequence alignment.
9. Write a note on Database Management System.

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