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Set **P**

**B.Sc. (Biotechnology) (Semester - III) (New) (CBCS) Examination:
March/April – 2026
Genetics – I (BT1301)**

Day & Date: Thursday, 02-04-2026
Time: 09:00 AM To 11:00 AM

Max. Marks: 40

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Multiple Choice Questions:**08**

- 1) Gene pairs in which paternal and maternal genes are different is called _____.
 - a) Heterozygous
 - b) Homozygous
 - c) Dominant
 - d) Recessive
- 2) The mechanism for exchanging genes on homologous chromosomes is _____.
 - a) Recombination
 - b) Crossing over
 - c) Segregation
 - d) Dominance
- 3) The mixed pattern of Coat Colour Fur in Rabbit is an example for _____.
 - a) Supplementary gene
 - b) Complementary gene
 - c) Multiple alleles
 - d) Inhibitory gene
- 4) Distance between genes on a Genetic map is measured as _____.
 - a) Centimeter unit
 - b) Millimeter unit
 - c) Map unit
 - d) Micrometer unit
- 5) The white Plumage of white leghorn is _____ over coloured plumage of any variety.
 - a) Recessive
 - b) Dominant
 - c) Co-dominant
 - d) Double Recessive
- 6) Person having Blood group _____ have no antibodies in their serum.
 - a) A
 - b) B
 - c) AB
 - d) O
- 7) In *Mirabilis Jalapa* variegated branches have _____ and _____.
 - a) Leukoplast and Xanthoplast
 - b) Chloroplast and Leukoplast
 - c) Chloroplast and Xanthoplast
 - d) Chloroplast and Chromoplast

- 8) The length of X chromosome is about _____ $m\mu$.
- a) 5.0 - 5.5
 - b) 4.0 - 4.5
 - c) 3.0 - 3.5
 - d) 1.0 - 1.5

Q.2 Answer the following questions briefly. (Any Four) 08

- a) Define Phenotype.
- b) Define Genetic Map.
- c) Define Plasmid.
- d) Define Alleles.
- e) Define Conjugation.
- f) Define Epistasis.

Q.3 Write notes on the following. (Any Two) 08

- a) Complementary gene
- b) Pseudo alleles
- c) Analysis of ordered Tetrads

Q.4 Write notes on the following. (Any Two) 08

- a) Explain Law of Independent Assortment with example.
- b) Explain Theories of crossing over and its importance.
- c) Explain Bacterial Transformation and its importance.

Q.5 Answer the following. (Any One) 08

- a) State and explain supplementary ratio with the help of suitable example.
- b) Discuss the ABO Blood group system in Man.

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**B.Sc. (Biotechnology) (Semester - III) (New) (CBCS) Examination:
March/April - 2026
General Microbiology – II (BT1304)**

Day & Date: Tuesday, 07-04-2026
Time: 09:00 AM To 11:00 AM

Max. Marks: 40

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Multiple Choice Questions.

08

- 1) Differences of light wavelength can be analysed with help of ____ microscopy.
 - a) Confocal
 - b) Dark field
 - c) Fluorescent
 - d) Phase contrast
- 2) To transfer cultures from one place to another, the device used is _____.
 - a) Slant
 - b) Needle
 - c) Inoculation loop
 - d) Autoclave
- 3) Which of the following is a selective medium for coliforms?
 - a) McConkeys
 - b) Nutrient agar
 - c) LB agar
 - d) Potato Dextrose agar
- 4) In grams staining _____ imparts color to the cells of Gram positive bacteria.
 - a) alcohol
 - b) iodine
 - c) saline
 - d) crystal violet
- 5) Peptidoglycan is a structural polysaccharide present in the cell walls of _____ bacteria.
 - a) Gram Positive
 - b) Gram negative
 - c) Acid fast
 - d) Neutral
- 6) The _____ medium used in Citrate utilization test.
 - a) Koser's citrate
 - b) MR-VP
 - c) Common agar
 - d) Lead acetate above
- 7) Reagent used for indole production test is _____.
 - a) Bromothymol reagent
 - b) Kovacs reagent
 - c) Kosers reagent
 - d) Fehlings reagent

- 8) For observation under oil immersion lens, _____ oil is used for its appropriate refractive index.
- a) pine wood
 - b) teak wood
 - c) cedar wood
 - d) sandal wood

Q.2 Answer in short. (Any Four) 08

- a) Draw a labeled diagram of compound microscope.
- b) Explain the structure of peptidoglycan.
- c) What is enrichment medium? Give an example.
- d) Differentiate between dye and stain?
- e) What is the composition of nutrient broth?
- f) Give examples of fluorescent stains.

Q.3 Write short notes on the following. (Any Two) 08

- a) Phase contrast microscopy
- b) Acid fast staining
- c) Methods of cell enumeration

Q.4 Answer the following question. (Any Two) 08

- a) Pure culture techniques in microbiology
- b) IMViC test
- c) Cultivation of anaerobic bacteria

Q.5 Answer the following question. (Any One) 08

- a) Write an account on Electron microscopy techniques.
- b) Describe theories and procedure of Grams staining.

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**B.Sc. (Biotechnology) (Semester - III) (New) (CBCS) Examination:
March/April - 2026
Plant Biotechnology - II (BT1306)**

Day & Date: Thursday, 09-04-2026
Time: 09:00 AM To 11:00 AM

Max. Marks: 40

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.
4) Use of logarithmic table and calculator is allowed.

Q.1 Multiple choice questions.**08**

- 1) _____ is used in vector-mediated gene transfer.
 - a) *E. Coll*
 - b) *Agrobacterium tumefaciens*
 - c) *Basillus spp.*
 - d) *Agrobacterium mutafaciens*
- 2) _____ is the physical method for direct transfer of genes.
 - a) PEG mediated
 - b) Dextran mediated
 - c) Calcium mediated
 - d) Liposome fusion
- 3) The Ti is referred to as _____.
 - a) Translocation inducing
 - b) Transfer inducing
 - c) Translation inducing
 - d) Tumor inducing
- 4) Hairy roots derived from the infection of a plant by _____.
 - a) *Agrobacterium*
 - b) *Basillus spp.*
 - c) *Rhizobium rhizogenes*
 - d) *Agrobacterium mutafaciens*
- 5) _____ are the non essential component of the plant growth.
 - a) Secondary metabolites
 - b) Primary metabolites
 - c) Saponins
 - d) Tannins
- 6) The conversion of nitrogen to ammonia or nitrogenous compounds is called as _____.
 - a) Nitrogen fixation
 - b) Nitrogen assimilation
 - c) Denitrification
 - d) Nitrification
- 7) One of the edible species mushrooms under cultivation is: _____.
 - a) *Valvaria volvacea*
 - b) *Amani a maesaria*
 - c) *Armillariella mellea*
 - d) *Amanita phalloides*
- 8) _____ is most suitable for delivering edible vaccine.
 - a) Patato
 - b) Fungus
 - c) Mango
 - d) Coconut

- Q.2 Answer any four of the following** **08**
- a) Write about DNA transfer.
 - b) What is mean by Hairy roots culture?
 - c) Write about Ri plasmids.
 - d) Advantages of Hydroponic culture.
 - e) Write about transgenic technology.
 - f) Significance of floriculture.
- Q.3 Write short notes on the following. (Any Two)** **08**
- a) Explain Plant cell culture for production of useful secondary metabolites.
 - b) Describe vermicomposting technology.
 - c) Explain the role of Nutrient Film Technology.
- Q.4 Answer the following question. (Any Two)** **08**
- a) Describe molecular pharming.
 - b) Add a note on Plant growth promoting bacteria.
 - c) Write about Mushroom cultivation.
- Q.5 Answer the following question. (Any One)** **08**
- a) Describe direct method of gene transfer.
 - b) Explain in detail procedure of Biofertilizers.

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**B.Sc. (Biotechnology) (Semester - IV) (New) (CBCS) Examination:
March/April - 2026
Molecular Biology (Paper - I) (BT1401)**

Day & Date: Thursday, 09-04-2026
Time: 12:00 PM To 02:00 PM

Max. Marks: 40

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Multiple choice questions.**08**

- 1) Chromosomes contain _____.
 - a) only Proteins
 - b) only Nucleic Acids
 - c) Proteins and Nucleic Acid
 - d) only Vitamins
- 2) _____ is the Blueprint of life.
 - a) RNA
 - b) Protein
 - c) DNA
 - d) Fats
- 3) The Genetic material present in the plant viruses is _____.
 - a) DNA
 - b) RNA
 - c) Protein
 - d) Capsid
- 4) The Purines and Pyrimidines in DNA was identified by _____.
 - a) R. Altmann
 - b) Emil Fischer
 - c) A. Kossel
 - d) D. Todd
- 5) The four stranded DNA contains high proportion of _____.
 - a) Guanosine
 - b) Adenosine
 - c) Thymidine
 - d) Cytidine
- 6) Nucleic acid plays vital role in _____.
 - a) Amino Acid synthesis
 - b) Protein synthesis
 - c) RNA synthesis
 - d) Fatty Acid synthesis
- 7) In photo reactivation the enzyme photolyase cleaves _____ dimers.
 - a) G – G
 - b) C – C
 - c) T – T
 - d) A – A
- 8) Arthur Korenberg identified the Enzyme _____ involved in Replication.
 - a) DNA polymerase III
 - b) DNA polymerase I
 - c) DNA Ligase
 - d) DNA Primase

- Q.2 Answer any four of the following** **08**
- a) Define Central Dogma.
 - b) Define Gene.
 - c) Define Denaturation.
 - d) Define Nucleoid.
 - e) Define Mutagen.
 - f) Define Bidirectional Replication.
- Q.3 Write short notes on the following. (Any Two)** **08**
- a) Watson and Crick Model of DNA
 - b) Cot Curves Analysis
 - c) Organization of DNA in Prokaryotes
- Q.4 Answer the following question. (Any Two)** **08**
- a) Write in detail about types of DNA.
 - b) Write in detail about Griffiths Experiments.
 - c) Write in detail about D Loop Replication.
- Q.5 Answer the following question. (Any One)** **08**
- a) Explain Replication in Prokaryotes with neat diagram.
 - b) Explain properties of Genetic Code.

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Set **P**

**B.Sc. (Biotechnology) (Semester - IV) (New) (CBCS) Examination:
March/April – 2026
Molecular Biology (Paper - II) (BT1402)**

Day & Date: Friday, 10-04-2026
Time: 12:00 PM To 02:00 PM

Max. Marks: 40

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.
4) Use of logarithmic table and calculator is allowed.

Q.1 Multiple choice questions**08**

- 1) The complete RNA polymerase enzyme contains _____ subunits.
 - a) 5
 - b) 6
 - c) 4
 - d) 3
- 2) RNA Polymerase II is present in _____.
 - a) Nucleoli
 - b) Nucleoplasm
 - c) Nucleus
 - d) Nuclear Matrix
- 3) Protein which brings termination of Transcription is _____.
 - a) Omega
 - b) RecA
 - c) Rho
 - d) RecBcd
- 4) Non coding sequences are called _____.
 - a) Introns
 - b) ICONS
 - c) Exons
 - d) Nucleons
- 5) Every cell requires atleast _____ kinds of tRNA.
 - a) 20
 - b) 10
 - c) 5
 - d) 15
- 6) _____ is an Initiation codon for protein synthesis is.
 - a) AUG
 - b) TUG
 - c) CUG
 - d) UUG
- 7) Lac operon was proposed by _____.
 - a) Watson and Crick
 - b) Gregor Mendal
 - c) T.H. Morgan
 - d) Jacob and Monad
- 8) Tryptophan operon contains _____ structural genes.
 - a) 5
 - b) 3
 - c) 6
 - d) 1

- Q.2 Answer the following question. (Any Four) 08**
- a) Define Operon.
 - b) Define Exons.
 - c) Define Promoters.
 - d) Define Splits genes.
 - e) Define Codon.
 - f) Define Peptide Bond.
- Q.3 Write short notes on the following. (Any Two) 08**
- a) Structure of RNA polymerase
 - b) Lac operon
 - c) Promoters
- Q.4 Answer the following question. (Any Two) 08**
- a) Explain sigma factor and the Transcription unit.
 - b) Explain Eukaryotic Activators.
 - c) Explain structure of Spliceosome.
- Q.5 Answer the following question. (Any One) 08**
- a) Write in detail Transcription in Prokaryotes.
 - b) Write in detail properties of Genetic Code.

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**B.Sc. (Biotechnology) (Semester - IV) (New) (CBCS) Examination:
March/April – 2026
Immunology (Paper - I) (BT1403)**

Day & Date: Saturday, 11-04-2026
Time: 12:00 PM To 02:00 PM

Max. Marks: 40

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Choose correct alternatives:**08**

- 1) _____ type of immunoglobulin can pass through placenta.
 - a) IgG
 - b) IgM
 - c) IgE
 - d) Albumin
- 2) Maturation of T-lymphocytes occurs in _____.
 - a) thymus
 - b) bone marrow
 - c) lymph node
 - d) spleen
- 3) _____ is a localized tissue response to injury or other trauma characterized by pain, heat, redness, and swelling.
 - a) Inflammatory response
 - b) Hypersensitivity
 - c) Autoimmunity
 - d) AIDS
- 4) Host defenses that are mediated by B cells and T cells following exposure to antigen known as _____.
 - a) Adaptive immunity
 - b) Native immunity
 - c) Innate immunity
 - d) MALT
- 5) _____ is a group of genes encoding cell-surface molecules that are required for antigen presentation to T cells and for rapid graft rejection.
 - a) Immunogen
 - b) Epitope
 - c) Hapten
 - d) MHC
- 6) Dimeric form of antibody is _____.
 - a) IgA
 - b) IgG
 - c) IgM
 - d) IgE
- 7) Antibody mediated complement activation is called _____ pathway.
 - a) Lectin
 - b) Alternative
 - c) Classical
 - d) Properdine
- 8) Which of the following cells are involved in innate immune responses as well as adaptive immune responses?
 - a) Dendritic cells
 - b) Natural Killer cells
 - c) Macrophages
 - d) Neutrophils

- Q.2 Answer the following. (Any Four) 08**
- a) Explain adjuvant with an example.
 - b) Write in brief about dendritic cells.
 - c) Define innate and adaptive immunity.
 - d) Enlist the types of macrophages based on tissue localization.
 - e) What are complement proteins?
 - f) Define antibody and write its examples.
- Q.3 Answer the following. (Any Two) 08**
- a) Write a note on Physical barrier of immune system.
 - b) Write properties of cytokines.
 - c) Explain Spleen as a secondary lymphoid organs.
- Q.4 Answer the following. (Any Two) 08**
- a) Explain types of antigens.
 - b) Draw well labelled diagram of antibody and write its properties.
 - c) Explain Hematopoiesis.
- Q.5 Answer the following. (Any One) 08**
- a) Give detailed account on Primary lymphoid Organs of immune system.
 - b) Write general account on complement activation - classical pathway

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Set **P**

**B.Sc. (Biotechnology) (Semester - IV) (New) (CBCS) Examination:
March/April – 2026
Immunology (Paper - II) (BT1404)**

Day & Date: Monday, 13-04-2026
Time: 12:00 PM To 02:00 PM

Max. Marks: 40

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Multiple choice questions.**08**

- 1) Host defenses that are mediated by antigen-specific T cells known as _____.
 - a) Allergy
 - b) Autoimmunity
 - c) Cell mediated immune response
 - d) Cancer

- 2) Exogenous antigens processed by endocytic pathway are presented along with _____ molecules.
 - a) Class I MHC
 - b) Class II MHC
 - c) mlg
 - d) CD4

- 3) Exaggerated immune response that causes damage to the individual is known as _____.
 - a) Hypersensitivity
 - b) Anergy
 - c) Immunodeficiency
 - d) Autoimmunity

- 4) _____ is an organ specific autoimmune disorder.
 - a) SLE
 - b) Rheumatoid Arthritis
 - c) Cardiac Attack
 - d) Hashimoto's disease

- 5) _____ is an antigen-antibody interaction that aggregates particulate antigens, forming a macromolecular complex that yields a visible clump.
 - a) Agglutination
 - b) Hypersensitive reaction
 - c) Precipitation
 - d) Solvation

- 6) _____ is adaptive immunity that is induced by natural exposure to a pathogen or by vaccination.
 - a) Innate immunity
 - b) Passive immunity
 - c) Allergy
 - d) Active immunity

- 7) _____ vaccines are made from a protein or other small pieces taken from a killed virus or bacteria.
- a) Live-attenuated
 - b) Killed
 - c) Subunit
 - d) Conjugate
- 8) _____ is a series of spontaneous point mutations that generate minor antigenic variations in pathogens and lead to strain differences.
- a) Maturation
 - b) Activation
 - c) Antigenic drift
 - d) Aging

Q.2 Answer the following question briefly. (Any Four) 08

- a) Differentiate between humoral and cell mediated immune response.
- b) Write in brief about Nonspecific immunity to Bacteria.
- c) Explain Haemolytic Autoimmunity.
- d) What is an allergen? Give example.
- e) Explain passive immunization.
- f) Explain cross reactivity.

Q.3 Write short notes on the following. (Any Two) 08

- a) Features of antigen-antibody interactions
- b) Primary and secondary immune response
- c) Rheumatoid Arthritis

Q.4 Answer the following question. (Any Two) 08

- a) Write a note on recombinant Vector vaccines.
- b) Explain the principle of immunodiffusion.
- c) Explain mechanism of CTL mediated cytotoxicity.

Q.5 Answer the following question. (Any One) 08

- a) Give a detailed account on ELISA.
- b) Explain in detail processing of Exogenous Antigens by the Endocytic Pathway.

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**B.Sc. (Biotechnology) (Semester - IV) (New) (CBCS) Examination:
March/April – 2026
Animal Biotechnology (Paper - I) (BT1405)**

Day & Date: Wednesday, 15-04-2026
Time: 12:00 PM To 02:00 PM

Max. Marks: 40

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equation whenever necessary.
3) Figures to the right indicate full marks.

Q.1 Multiple choice questions:**08**

- 1) Transgenic animals have _____.
 - a) foreign protein
 - b) foreign gene
 - c) foreign lipid
 - d) foreign amino acid
- 2) _____ is NOT the major function of the serum.
 - a) Promotion of tuber and bulb formation
 - b) Stimulate cell growth
 - c) Enhance cell attachment
 - d) Provide transport proteins
- 3) How long does it take for the autoclave to complete its cycle?
 - a) 30 - 35 minutes
 - b) 50 min to 1 hr
 - c) 15 - 20 minutes
 - d) 120 minutes
- 4) _____ are also known as somatic stem cells.
 - a) Adult stem cells
 - b) Cancer cells
 - c) Endometrial cells
 - d) Epithelial cell
- 5) IVF stands for _____.
 - a) In vivo fertilization
 - b) In vitro fertilization
 - c) In vivo fermentation
 - d) In vitro fermentation
- 6) Viability is defined as a percentage of _____ in a whole population.
 - a) Non-living cells
 - b) Dead cells
 - c) Live cells
 - d) Unstained cells
- 7) A primary cell line is _____.
 - a) Continuous cell lines
 - b) having unlimited lifespan
 - c) Immortal
 - d) having limited lifespan
- 8) HEPA filter is nothing but _____.
 - a) High efficiency partial air filter
 - b) Heavy effective pressure air filter
 - c) High efficiency particulate air filter
 - d) None of these

- Q.2 Answer the following. (Any Three) 08**
- a) Define cell line.
 - b) Define Biosafety.
 - c) Define Primary cell culture.
 - d) Define transgenesis.
 - e) Define cell proliferation.
- Q.3 Answer the following. (Any Two) 08**
- a) Explain characterization of cultured cells.
 - b) Explain GMP and GLP.
 - c) Explain cell viability and cytotoxicity.
- Q.4 Write short on. (Any Two) 08**
- a) Cell adhesion
 - b) Microinjection
 - c) Cartagena protocol on biosafety
- Q.5 Answer the following. (Any One) 08**
- a) What is stem cell technology? Explain in details about its types.
 - b) What is animal propagation? Explain in details about embryo transfer techniques.

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**B.Sc. (Biotechnology) (Semester - IV) (New) (CBCS) Examination:
March/April – 2026
Animal Biotechnology (Paper - II) (BT1406)**

Day & Date: Thursday, 16-04-2026
Time: 12:00 PM To 02:00 PM

Max. Marks: 40

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.

Q.1 Multiple choice questions**08**

- 1) Transgenic animals have _____.
a) foreign protein b) foreign gene
c) foreign lipid d) foreign amino acid
- 2) Coccidiosis is an infection of _____.
a) Brain b) Tongue
c) Eyes d) Intestine
- 3) A collection of methods that allows correction of a gene that has been diagnosed in child/embryo is called _____.
a) cloning b) gene therapy
c) chemotherapy d) dialysis
- 4) The name of the first transgenic cow was _____.
a) Dolly b) Mary
c) Rosie d) Elle
- 5) Transgenic mice are being developed for use in testing the safety of vaccines before they are used on _____.
a) cattle b) humans
c) pigs d) monkeys
- 6) _____ includes rules of conduct that may be used to regulate our activities concerning the biological world.
a) Bio-piracy b) Biosafety
c) Bioethics d) Bio-patents
- 7) _____ get when we fuse Spleen cells and Myeloma cells.
a) Hybridoma cells b) Red blood cells
c) Killer cells d) Cancer myeloma B-cell
- 8) In _____ year was the first clinical gene therapy given.
a) 2010 b) 1990
c) 1995 d) 2000

- Q.2 Attempt the following. (Any Three) 08**
- a) Define transgenic animal.
 - b) Define Trypanosomiasis.
 - c) Define vectors.
 - d) Define cloning.
 - e) Define genome
- Q.3 Attempt the following. (Any Two) 08**
- a) Explain Improvement of biomass.
 - b) Explain Foot-and mouth disease.
 - c) Explain cell culture-based vaccines
- Q.4 Answer the following. (Any Two) 08**
- a) Hybridoma technology.
 - b) Transferring a functional copy of the gene into the genome.
 - c) Transgenic mice model for tackling human diseases.
- Q.5 Answer of the following. (Any One) 08**
- a) What is animal Biotechnology? Explain in details about its application in case of gene therapy.
 - b) What are bioethics? Explain in details about ethical issues.

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**B.Sc. (Biotechnology) (Semester - V) (New) (CBCS) Examination:
March/April – 2026
English
Business English (BT1501)**

Day & Date: Tuesday, 28-04-2026
Time: 03:00 PM To 05:00 PM

Max. Marks: 40

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative and rewrite the sentence. 08

- 1) 'I have Three Visions for India', is a famous speech by Dr. Kalam which he delivered at _____.

a) IIT, Kharagpur	b) IIT, Hyderabad
c) II, Lucknow	d) IIM, Kolkatta

- 2) What was Phatik's deepest desire?

a) to belong and be loved	b) to be a ringleader
c) to be a boatsman	d) to become a teacher

- 3) Who is described as "Mewling and puking in the nurse's arm"?

a) Soldier	b) school-boy
c) Judge	d) Infant

- 4) What order does the king give the vizier?

a) to find expensive diamonds	b) to replace the queen
c) to find seven new brides	d) to kill the queen

- 5) 'The Village Schoolmaster' is a poem by Anglo-Irish poet _____.

a) Oliver Goldsmith	b) William Shakespeare
c) Rabindranath Tagore	d) None of these

- 6) What is madness according to the poet?

a) Love	b) Money
c) Corruption	d) Power

- 7) The car is being washed by the driver. (Choose the correct form of active voice.)

a) The driver has been washing the Car	b) The driver is washing the Car
c) The driver has washed the Car	d) The driver was washing the Car

- 8) The manager was ____ an explanation of his conduct. (Choose the correct phrasal verb)
- | | |
|---------------|---------------|
| a) called for | b) called off |
| c) called to | d) called up |

Q.2 Write answer in short. (Any Four) 12

- a) Mention the four milestones of Dr. Kalam's career.
- b) What led to Phatik's desire to go back home?
- c) Justify the poet's statement 'We must have some money', mentioned in the poem 'Money Madness'.
- d) Describe the stages of human life presented in the poem, 'All the World's a Stage'.
- e) Why is the Queen unsatisfied and seeks a rival?
- f) Write the character sketch of the village schoolmaster.

Q.3 Answer the following question. (Any One) 10

- a) Elaborate the types of 21st century skills.

OR

- b) Define the 4C's of learning skills.

Q.4 Write a detailed note on 21st century skills and It's significance. 10

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**B.Sc. (Biotechnology) (Semester - V) (New) (CBCS) Examination:
March/April – 2026
Bioprocess Technology (BT1502)**

Day & Date: Wednesday, 29-04-2026
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.
4) Use of logarithmic table and calculator is allowed.
(At. Wts.: H=1, C=12, O=16, N=14, Na=23, Cl=35.5)

Q.1 A) Choose the correct alternative. 10

- 1) _____ is a key development in modern fermentation technology.
 - a) The discovery of glycolysis
 - b) The use of genetic engineering to improve microbial strains
 - c) The principle of lactic acid fermentation
 - d) The production of antibiotics from microbes

- 2) The Batch Culture is _____ Culture System.
 - a) Open
 - b) Closed
 - c) Isolated
 - d) Semi-closed

- 3) The _____ procedure has a great application in strain improvement.
 - a) rDNA Technology
 - b) Conjugation
 - c) Transformation
 - d) Transduction

- 4) Which of the following mineral is not required for microorganism development?
 - a) Pb
 - b) K
 - c) S
 - d) Mg

- 5) The non-agitated fermentations are carried out in vessels of a height to diameter ratio is _____.
 - a) 1:2
 - b) 5:1
 - c) 3:2
 - d) 4:1

- 6) The raw material is useful for the production of alcohol is _____.
 - a) Waste liquor
 - b) Molasses
 - c) Starch
 - d) Alkanes

- 7) In World War II, the fermentation was used for the production of _____.
 - a) Alcohol
 - b) Antibiotics
 - c) Wine
 - d) Beer

B) Attempt the following: **08**
Describe in detail about Upstream Processing.

Q.5 Attempt the following. (Any Two) **16**

- a) Write in detail about Microbial production of ethanol and gives its Applications.
- b) Add a detail on the Downstream Processing.
- c) Define Bioreactor. Write a detailed account on Bioreactor with suitable example with diagram.

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Set **P**

**B.Sc. (Biotechnology) (Semester - V) (New) (CBCS) Examination:
March/April- 2026
Recombinant DNA Technology (BT1503)**

Day & Date: Thursday, 30-04-2026
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.

Q.1 A) Multiple choice questions**10**

- 1) _____ enzyme removes nucleotides from the 3' hydroxyl ends of double-stranded DNA.
 - a) Endonuclease
 - b) Exonuclease
 - c) Ligase
 - d) Helicase

- 2) _____ is an RNA-dependent DNA polymerase that uses an RNA molecule as a template for the synthesis of a complementary DNA strand.
 - a) Exonuclease I
 - b) Lambda exonuclease
 - c) Reverse transcriptase
 - d) EcoRI

- 3) _____ is a vector that uses the cos end sequences of bacteriophage λ and in vitro bacteriophage packaging to form a plasmid.
 - a) Cosmid
 - b) Phagemid
 - c) Plasmid
 - d) YAC

- 4) A technique that uses a nucleic acid probe to identify a bacterial colony with a vector carrying a specific cloned gene(s) is known as _____.
 - a) Blue-white screening
 - b) immunological screening
 - c) antibiotic resistance screening
 - d) Colony hybridization

- 5) _____ is a technique for amplifying a specific segment of DNA by using a thermostable DNA polymerase, deoxyribonucleotides, and primer sequences in multiple cycles of denaturation, renaturation, and DNA synthesis.
 - a) Polymerase chain reaction
 - b) Electrophoresis
 - c) Gel documentation
 - d) Hybridization

- 6) Which one of the following reagents is commonly used for precipitation of DNA?
 - a) Chloroform-isoamyl alcohol
 - b) Phenol-chloroform
 - c) Ethanol
 - d) SDS

- 7) Which of the following is a property of PCR primers?
 a) They are around 15-30 bases long
 b) Forward and reverse primers are complementary to each other
 c) They are dsDNA
 d) They anneal to the target sequence at 72°C
- 8) Which of the following is the third generation DNA sequencing technology?
 a) Sanger sequencing
 b) Oxford Nanopore sequencing
 c) Illumina sequencing
 d) Maxam-Gilbert sequencing
- 9) Which one of the following is a Molecular Marker?
 a) RFLP
 b) MRI
 c) HPLC
 d) MALDI-TOF
- 10) _____ is a gene from one source that has been incorporated into the genome of another organism.
 a) Allele
 b) Transgene
 c) Cistron
 d) Muton

B) One sentence answer.**06**

- 1) Write function of DNA ligase.
- 2) What is bacterial transformation?
- 3) Write full abbreviation of AFLP.
- 4) Which enzyme is used for reverse transcriptase PCR?
- 5) Mention an example of delayed fruit ripening by recombinant DNA technology.
- 6) What is Phagemid?

Q.2 Solve the following. (Any Eight)**16**

- a) Differentiate between YAC and BAC.
- b) What are shuttle vectors?
- c) Enlist selectable markers used in recombinant screening in plants.
- d) Define probe.
- e) What are edible vaccines? Give an example.
- f) Draw a well-labeled diagram of a typical bacterial plasmid vector.
- g) Explain in brief the principle of real time PCR.
- h) Write the names of any two organic solvents and two salts used in isolation and purification of DNA.
- i) State any two differences between genomic DNA probes and cDNA probes.
- j) Enlist molecular markers.

- Q.3 A) Attempt the following. (Any Two) 10**
- 1) Discuss the utility of plants as bioreactors for polymers with a suitable example.
 - 2) Write a detailed note on production of human hormones by genetic engineering with one example.
 - 3) How are heterologous proteins produced in plant systems? Elaborate with one example.
- B) Explain Screening of recombinants. 06**
- Q.4 A) Attempt the following. (Any Two) 08**
- 1) What are restriction endonucleases? Describe their types and properties.
 - 2) Explain the characteristic feature of pBR322.
 - 3) What are molecular markers? Explain the principle of RFLP.
- B) Explain in detail- DNA sequencing technologies. 08**
- Q.5 Attempt the following. (Any Two) 16**
- a)** Write a detailed account on enzymes used in recombinant DNA technology.
 - b)** Expand on the features of eukaryotic vectors with at least one example each- plant viral vectors, animal viral vectors, yeast vectors.
 - c)** How is recombinant screening performed in plant cells and animal cells? Explain in detail.

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Set **P**

**B.Sc. (Biotechnology) (Semester - V) (New) (CBCS) Examination:
March/April – 2026
Bioinformatics (BT1504)**

Day & Date: Saturday, 02-05-2026
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.

Q.1 A) Multiple choice questions: 10

- 1) SCOP stands for structural classification of _____.
 - a) DNA
 - b) Lipids
 - c) Protein
 - d) Carbohydrates
- 2) Which of the following tools used to compare two sequence?
 - a) EMBOSS
 - b) Rasmol
 - c) BLAST
 - d) FASTA
- 3) Which of the following is Protein sequence databases?
 - a) NRDB
 - b) EMBL
 - c) DDBJ
 - d) GenBank
- 4) Which of the following is a structural database?
 - a) EMBL
 - b) GenBank
 - c) PDB
 - d) DDBJ
- 5) Which alignment contains more than two sequences?
 - a) Multiple sequence
 - b) Pairwise sequence
 - c) Global
 - d) Local
- 6) BLAST sequence alignment tool was designed by _____.
 - a) Dayhoff
 - b) Altschul
 - c) Smith
 - d) Waterman
- 7) Clustal W program accepts the input sequences only in the _____ format.
 - a) GenBank
 - b) embl
 - c) Pdb
 - d) fasta
- 8) The family that consists of related genes within an organism is called _____.
 - a) Orthologs
 - b) zoologs
 - c) Paralogs
 - d) xenologs

- 9) OWL is _____ database.
- | | |
|----------------|---------------|
| a) Redundant | b) Composite |
| c) Unannotated | d) Unverified |
- 10) Which of the following is a search engine of NCBI?
- | | |
|-----------|-----------|
| a) SRS | b) Entrez |
| c) Atlas' | d) BankIt |

B) One sentence answer.**06**

- 1) Define SCOP
- 2) Define CATH
- 3) TrEMBL
- 4) PDBsum
- 5) Entrez
- 6) BLAST

Q.2 Solve the following. (Any Eight)**16**

- a) Explain the components of Bioinformatics.
- b) Describe NCBI Bookshelf.
- c) Describe any 2 Nucleic acid sequence databases.
- d) Write a short note on nomenclature and code letters in DNA.
- e) Write a short note on PROSITE.
- f) Write a short BLAST.
- g) What is Multiple alignment?
- h) What are Bibliographic databases?
- i) Write in brief about FASTA.
- j) Write in brief about Phylip tool.

Q.3 A) Attempt the following. (Any Two)**10**

- 1) Physicochemical property prediction from primary protein sequence.
- 2) Write a method of Phylogenetic analysis.
- 3) Difference between Primary protein databases and Structural protein databases.

B) Write a note on Prokaryotic and eukaryotic gene prediction.**06****Q.4 A) Attempt the following. (Any Two)****08**

- 1) Write a note on Phylogenetic tree of life.
- 2) Write a note on Pairwise algorithm and tools.
- 3) Write a note on DDBJ.

B) Explain in detail three importance databases in Bioinformatics.**08****Q.5 Attempt the following. (Any Two)****16**

- a) What is databases? Explain the protein composite sequence databases.
- b) What is the 3D structure? Explain Different structure databases
- c) What is Phylogenetic analysis? Explain there methods?

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Set **P**

**B.Sc. (Biotechnology) (Semester - V) (New) (CBCS) Examination:
March/April – 2026
Intellectual Property Rights (BT1505)**

Day & Date: Monday, 04-05-2026
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams wherever necessary.
3) Figures to the right indicate full marks.

Q.1 A) Multiple Choice questions.**10**

- 1) What protects the intellectual property created by inventors?
 - a) Copyright
 - b) geographical indications
 - c) Patents
 - d) registered designs
- 2) What protects the intellectual property created by designers?
 - a) Copyright
 - b) geographical indications
 - c) Trademarks
 - d) registered designs
- 3) _____ are intellectual property (IP) rights on confidential information which may be sold or licensed.
 - a) Trade secret
 - b) Industrial Design
 - c) Trade mark
 - d) Trade dress
- 4) The Paris Convention for the Protection of Industrial Property, 1883. The Paris Convention applies to _____.
 - a) Trademarks, unfair competition, and patents
 - b) Geographical Indications
 - c) Wines and Spirits
 - d) All of the above
- 5) _____ is an international convention which provides a common basis for the examination of plant varieties for determining whether a plant variety merits protection.
 - a) WIPO
 - b) TRIPS
 - c) UPOV
 - d) PCT
- 6) _____ allows a government to authorize the use of a patented invention without the patent holder's consent, typically under specific circumstances and with provisions for compensation.
 - a) Surrender
 - b) Compulsory License
 - c) Revocation
 - d) Restoration

- Q.4 A) Attempt the following. (Any Two) 08**
- 1) Describe in detail the TRIPS agreement, 1994.
 - 2) Explain about Universal Copyright Convention, 1952.
 - 3) What are farmers' rights.
- B) Describe/Explain/Solve: 08**
- Explain in detail Kinds of Intellectual Property Rights.
- Q.5 Attempt the following. (Any Two) 16**
- a) Describe patenting of biological material with one suitable example.
 - b) Write a note on WIPO Convention 1967.
 - c) Describe in detail about UPOV and its contribution in plant breeder's rights.

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Set **P**

**B.Sc. (Biotechnology) (Semester - VI) (New) (CBCS) Examination:
March/April – 2026
English
Business English (BT1601)**

Day & Date: Tuesday, 28-04-2026
Time: 12:00 PM To 02:00 PM

Max. Marks: 40

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q.1 Choose the correct alternative from the given options: 08

- 1) What has been the cause of reduced personal contact between the teacher and the taught?
 - a) reduction in the number of schools
 - b) reduction in the number of teachers
 - c) general fall in the quality of education
 - d) increase in the number of students in school

- 2) What interrupted Aksionov when he was about to have his tea?
 - a) the arrival of fellow merchant
 - b) the arrival of police officers
 - c) the arrival of innkeeper
 - d) the arrival of Makar Semyonich

- 3) The poem 'Endless Time' is addressed to _____.

a) Sun	b) Man
c) God	d) Moon

- 4) What is the form of the poem 'My Last Duchess'?

a) a sonnet	b) a ballad
c) a free verse poem	d) a dramatic monologue

- 5) What makes for itself a colling covert against the hot season?

a) Daffodils	b) Beauty
c) clear rill	d) Animals

- 6) At night the _____ is lowered to keep out the wind.

a) Combat	b) Sash
c) Calm	d) Lumper

- 7) He went _____ to his office to look for his lost keys. (Choose the correct adverb)

a) Back	b) Backside
c) While	d) Over

- 8)** Rani replied that she could not do so. (Write into Direct Speech)
- a) Rani replied, "I cannot do so"
 - b) Rani replied, "I can do so"
 - c) Rani replied, "I may not do so"
 - d) Rani replied, "I may do so".

Q.2 Answer the following question. (Any Four) 12

- a) What are the responsibilities of young citizens?
- b) Write the appropriateness of the title 'God Sees the Truth but Waits'?
- c) Describe the impact of the first line with relation to the theme of the poem 'Ode to Beauty'.
- d) What is the central idea of the poem 'Endless Time'?
- e) What is the theme of the poem 'Tree at my Window'?
- f) Describe the personality of the Duchess.

Q.3 Answer the following question. (Any One) 10

- a) Write a note on environment consciousness and health literacy. Add their importance.
- b) Describe two situations in which you had to change your decision and adapt to changed scenario.

Q.4 Write a detail note on three most important literacy skills and their importance. 10

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Set **P**

**B.Sc. (Biotechnology) (Semester - VI) (New) (CBCS) Examination:
March/April – 2026
Bio-Analytical Tools (BT1602)**

Day & Date: Wednesday, 29-04-2026
Time: 12:00 PM To 03:00 PM

Max. Marks: 80

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.

Q.1 A) Multiple choice questions: 10

- 1) Which of the following is a component of electrophoresis technique?
 - a) Ion source
 - b) Analyzer
 - c) Detector
 - d) Power pack

- 2) In size exclusion chromatography, solute molecules are separated based on _____.
 - a) Molecular geometry and size
 - b) Molecular composition
 - c) Molecular phase
 - d) Molecular formula

- 3) Which of the following is an example of bulk property or general detector in HPLC?
 - a) Fluorescence detector
 - b) Refractive index detector
 - c) Electrochemical detector
 - d) UV-Visible detector

- 4) _____ is a process that uses centrifugal force to separate and purify mixtures of biological particles in a liquid medium.
 - a) Centrifugation
 - b) Electrophoresis
 - c) Spectroscopy
 - d) Chromatography

- 5) _____ describes the migration of a charged particle under the influence of an electric field.
 - a) Chromatography
 - b) Electrophoresis
 - c) Microscopy
 - d) Blotting

- 6) _____ is a linear polysaccharide made up of the basic repeat unit agarobiose, which comprises alternating units of galactose and 3,6-anhydrogalactose.
 - a) Agarose
 - b) Agar
 - c) Starch
 - d) Acrylamide

- 7) Molecular (sub-) structures responsible for interaction with electromagnetic radiation are called _____.
 a) Cytochromes b) Mordant
 c) Chromophores d) Chromogenic
- 8) In UV spectrophotometer, _____ bulb as a source for the UV region.
 a) tungsten b) deuterium
 c) photocell d) galvanometer
- 9) Within the electromagnetic spectrum, the energy range below the UV/Vis is the infrared region, encompassing the wavelength range of about _____.
 a) 700 nm to 25 μ m b) 10 nm to 100 nm
 c) 100 nm to 300 nm d) 400 nm to 700 nm
- 10) Which biomolecules are blotted using Southern blotting technique?
 a) DNA b) RNA
 c) Protein d) Lipid

B) Write Definition of the following. 06

- 1) pH
- 2) Electrode
- 3) Electromagnetic wave
- 4) Turbidometry
- 5) Chromatography
- 6) blotting

Q.2 Solve the following. (Any Eight) 16

- a) Differentiate between analytical and preparative centrifuge.
- b) State Beer-Lambert' Law
- c) Write about pH indicators.
- d) What is isoelectric point?
- e) Elaborate extinction coefficient.
- f) Write applications of HPLC.
- g) What is Dot Blot technique?
- h) Write about calibration of pH electrode.
- i) Draw a neat, labelled diagram of SDS-PAGE.
- j) Write about Electromagnetic spectrum.

Q.3 A) Attempt the following. (Any Two) 10

- 1) Describe the principle and working of Gas Chromatography.
- 2) Describe SDS-PAGE and its significance in characterization of proteins.
- 3) Write a note on measurements of pH.

B) Short note/Solve. 06

Explain the construction and working of colorimeter.

- Q.4 A) Answer the following. (Any Two) 08**
- 1) Enlist the applications of chromatography.
 - 2) With a neat labelled diagram explain agarose gel electrophoresis.
 - 3) Explain the steps involved in Southern Blotting.
- B) Describe/Explain/Solve 08**
- Explain in brief the theory, principles and applications of UV-Visible spectroscopy.
- Q.5 Answer the following. (Any Two) 16**
- a) Define Chromatography. Add a note on principle and applications gel filtration chromatography.
 - b) Give a detailed account on Principle, applications and Types of Centrifugation.
 - c) Explain Dot Blot technique.

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Set

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**B.Sc. (Biotechnology) (Semester - VI) (New) (CBCS) Examination:
March/April – 2026
Genomics and Proteomics (BT1603)**

Day & Date: Thursday, 30-04-2026
Time: 12:00 PM To 03:00 PM

Max. Marks: 80

- Instructions:**
- 1) All questions are compulsory.
 - 2) Draw neat diagrams and give equations wherever necessary.
 - 3) Figures to the right indicate full marks.
 - 4) Use of logarithmic table and calculator is allowed.

Q.1 A) Multiple choice questions.

10

- 1) In the clone contig method of genome sequencing the map is prepared by using a set of _____ clones.

a) missing	b) noncoding
c) overlapping	d) repeating
- 2) The concept of RNA world Hypothesis was put by _____.

a) Eric Lander	b) Carl Woese
c) Harold Varmus	d) Fredrick Sanger
- 3) Sequencing of all the functional elements of human genomes was undertaken by _____project.

a) Shot Gun	b) HapMap
c) 1000	d) ENCODE
- 4) The Human Genome Project was started and completed in the years _____ respectively.

a) 1965 and 1980	b) 1990 and 2003
c) 1979 and 1990	d) 1947 and 1960
- 5) The identification of drugs through the genomic study is _____.

a) Pharmacy	b) Pharmacology
c) Pharmacogenomics	d) Drugology
- 6) The sequencing of genomic DNA is included in _____.

a) phenotypic function	b) cellular function
c) molecular function	d) structural genomics
- 7) _____ is not used as protein denaturant.

a) acetic acid	b) SDS
c) Phenol	d) DTT
- 8) The electrophoresis technique that uses isoelectric focusing is _____.

a) 2D-PAGE	b) AGE
c) PFGE	d) SDS-PAGE

Q.5 Answer the following. (Any Two)

16

- a)** Explain Mass Spectrometry method for protein identification.
- b)** Write a note on Whole-genome shotgun sequencing.
- c)** Explain the applications of genomics and proteomics.

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Set **P**

**B.Sc. (Biotechnology) (Semester - VI) (New) (CBCS) Examination:
March/April – 2026
Evolutionary Biology (BT1604)**

Day & Date: Saturday, 02-05-2026
Time: 12:00 PM To 03:00 PM

Max. Marks: 80

- Instructions:** 1) All questions are compulsory.
2) Draw neat diagrams and give equations wherever necessary.
3) Figures to the right indicate full marks.

Q.1 A) Fill in the blanks by choosing correct alternatives: 10

- 1) _____ rRNAs act as structural RNA as well as ribosome in bacteria.
 - a) 5S rRNA
 - b) 18S rRNA
 - c) 23 S rRNA
 - d) 5.8 S rRNA

- 2) _____ experiments cracked the DNA and discovered unequivocally that genetic code is triplet.
 - a) Hershey and Chase
 - b) Morgan and Sturtevant
 - c) Beadle and Tatum
 - d) Nirenberg and Matthaei

- 3) _____ is the central concept of Lamarckism.
 - a) Inheritance of acquired characteristics
 - b) Natural Selection
 - c) Survival of fittest
 - d) Genetic drift

- 4) Speciation of sympatric species is due to _____.
 - a) Geographical Isolation
 - b) Reproductive Isolation
 - c) Separation
 - d) Migration

- 5) The earliest geological timescale among the following is _____.
 - a) Quaternary
 - b) Permian
 - c) Jurassic
 - d) Cambrian

- 6) evolutionary trees based on descent from shared ancestors are called _____.
 - a) Phylogenies
 - b) family tree
 - c) clades
 - d) speciation

- 7) Analogous organs arise due to _____.
 - a) Divergent evolution
 - b) Artificial selection
 - c) Genetic drift
 - d) Convergent evolution

Q.5 Answer the following. (Any Two)

16

- a) Explain theories of evolution.
- b) Define Speciation and Describe in detail the modes of Speciation.
- c) Explain in detail about Unique hominin characteristics contrasted with Primate characteristic.

Seat No.	
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Set **P**

**B.Sc. (Biotechnology) (Semester - VI) (New) (CBCS) Examination:
March/April – 2026
Environmental Biotechnology (BT1605)**

Day & Date: Monday, 04-05-2026
Time: 12:00 PM To 03:00 PM

Max. Marks: 80

- Instructions:** 1) All questions are compulsory.
2) Draw neat labelled diagrams wherever necessary.
3) Figures to the right indicate full marks.

Q.1 A) Multiple choice questions.**10**

- 1) The term Mycorrhiza is coined by _____.
 - a) A. B. Frank
 - b) M. Beijerinck
 - c) Winogradsky
 - d) L. Pasteur
- 2) Oil spills have been considered as a major threat to world environment, especially _____.
 - a) Marine ecosystem
 - b) Terrestrial ecosystem
 - c) Land ecosystem
 - d) Vertebrates
- 3) Which of following is not a process of remediation?
 - a) Vitrification
 - b) Thermal
 - c) Bioleaching
 - d) Chemical
- 4) Which method is best suitable for disposing of plastic wastes and polythene bags?
 - a) Burning and incineration
 - b) Digesting
 - c) Dumping
 - d) Recycling
- 5) _____ of the following is not a Methanogenic bacteria.
 - a) Methanobacterium
 - b) Methanobrevibacter
 - c) Methanococcus
 - d) Trichoderma
- 6) The first superbug was created by _____ by plasmid transfer method.
 - a) Dr. A. M. Chakrabarty
 - b) Dr. D.C. Khurana
 - c) Dr. Brijmohan Upadhyay
 - d) Beijerinck
- 7) The use of plants to remove contaminants from the environment and concentrate them in above-ground plant tissue is known as _____.
 - a) Phytoextraction
 - b) Phytostabilization
 - c) Phytostimulation
 - d) phytotransformation
- 8) Identify the type of waste which can be degraded by composting, vermicomposting and land fills method.
 - a) Plastic
 - b) Tins and metals
 - c) Biodegradable
 - d) Non-Biodegradable

- 9) Bioremediation _____.
- usage of microbes to create new organisms
 - usage of anaerobic bacteria to create new antibiotics
 - usage of microbes to destroy environmental pollutants
 - usage of aerobic bacteria to create new vaccines
- 10) _____ represents the amount of oxygen consumed by bacteria and other microorganisms while they decompose organic matter under aerobic (oxygen is present) conditions at a specified temperature.
- Biochemical oxygen demand (BOD)
 - Chemical oxygen demand
 - Nitrification
 - Denitrification

B) Fill in the blanks:**06**

- The enzyme involved in nitrogen fixation is _____.
- Lichens is the symbiotic association between _____.
- _____ is example of conventional fuel source.
- _____ percent of impurities are enough to make domestic sewage unfit for human.
- In India, Environmental protection Act was passed at _____ by Indian Parliament
- The use of bacteria and other microorganisms to breakdown hazardous waste into relatively harmless components, is termed as _____.

Q.2 Solve the following. (Any Eight)**16**

- Soil fertility.
- Explain Conventional fuels with examples.
- Discuss any 2 microorganisms used in bioleaching.
- Define gold leaching.
- What do you mean by VAM?
- What is a genetically modified microorganism?
- Give the names of any two Petroleum products?
- Give any two examples of leguminous plants.
- Write significance of Mycoremediation.
- Define Environmental biotechnology and give its application.

Q.3 A) Attempt the following. (Any Two)**10**

- Discuss Role of Algal and fungal bio-fertilizers in enhancement of soil fertility.
- Write a note on phosphate solubilizing bacteria.
- Explain genetically modified microbes and its role in environmental clean up.

B) Write a Short note on Environment Protection Act (EPA).**06**

- Q.4 A) Attempt the following. (Any Two) 08**
- 1) Discuss in detail Role of symbiotic nitrogen fixing bacteria in the enrichment of soil.
 - 2) Give a detailed account on Bioleaching.
 - 3) Write a note on Biomedical waste management.
- B) Describe in detail agriculture and food industry waste to produce alcohol & gasohol. 08**
- Q.5 Attempt the following. (Any Two) 16**
- a)** Write a detailed account on Conversion of sugars, agriculture and food industry waste (Corn starch, cotton) to alcohol.
 - b)** Write in detail about the biological methods of wastewater treatment
 - c)** Concept of bioremediation and importance of bioremediation.