SLR-SP-1

Seat No.	

Set P

M.Sc. (Semester - I) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Cytology and Taxonomy of Microorganisms (MSC23101)

Day & Date: Wednesday, 19-07-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question no. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figure to right indicates full marks.

Q.1 A) Choose correct alternative. Write the sentence again. **10**

1) The taxa having the ending-mycetes is _____.
   a) Division b) Subdivision
   c) Class d) Order

2) In binomial nomenclature, second name represents _____.
   a) species b) order
   c) kingdom d) class

3) Mycorrhizae are mutualistic associations between fungi and _____.
   a) Bacteria b) Protozoa
   c) Unicellular green algae d) Vascular

4) What is most distinguishing feature of mycoplasma?
   a) Wall less b) Saprophyte
   c) Marine d) Ozone layer habitat

5) Select the statement that does not apply to the kingdom Fungi _____.
   a) The fungi are eukaryotic, multicellular, ingestive heterotrophs
   b) Some fungi form beneficial interrelationships with plants
   c) The fungal life cycle typically includes a spore stage
   d) Certain fungi are natural sources of antibiotic substances

6) Parasitic alga is _____.
   a) Cephaleuros b) Ulothrix
   c) Spirogyra d) Chlamydomonas

7) According to Bergey's Manual of Systematic Bacteriology, prokaryotes that lack a cell wall belong to the group?
   a) Gracilicutes b) Firmicutes
   c) Tenericute d) Mendosicutes

8) Which of the following statement about Rickettsiae is not correct?
   a) Rickettsiae are obligate intracellular bacteria
   b) Weil-Felix test can be used in the diagnosis of rickettsial disease
   c) All the rickettsial diseases are zoonoses
   d) Rickettsiae are gram-negative but stain poorly with standard Gram Stain

9) The symbiotic association of algae and fungi is known as _____.
   a) Mycorrhiza b) Lichen
   c) Mycoplasma d) Both (a) and (b)

10) Which of the following statements are NOT the distinguishing features of the family *Chlamydiaceae*?
   a) They are seen on Gram stain
   b) They are obligate intracellular bacteria
   c) They cannot make ATP
   d) They consist of two forms elementary and reticulate body

B) Write True or False. **06**

1) The structure of the typical rickettsia is very similar to that of Gram-negative bacteria.
2) Chlamydia do not multiply by binary fission
3) The cytoplasm of mycoplasma contains ribosomes, but lacks mesosomes.
4) All cyanobacteria do not contain chlorophyll a.
5) Lichen growing on bark of tree are called corticoles
6) Green alga belogs to chlorophycophyta

Q.2 Answer the following **16**

a) Mycorrhizae
b) Applications of actinomycetes
c) Chemotaxonomy
d) Types of lichen

Q.3 Answer the following.

a) Outline classification of prokaryotic organisms **08**
b) Cell differentiation in bacteria **08**

Q.4 Answer the following.

a) General characteristics of actinomycetes **08**
b) Importance of alga **08**

Q.5 Answer the following.

a) General characteristics of rickettsia **08**
b) Classification of fungi **08**

Q.6 Answer the following.

a) General characteristics of Cyanobacteria **08**
b) Outline classification of Actinomycetes **08**

Q.7 Answer the following.

a) Surface properties of bacteria **10**
b) Bergey's Manual of Systemic Bacteriology **06**

SLR-SP-2

Seat No.	

Set P

M.Sc. (Semester - I) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Microbial Chemistry and Enzymology (MSC23102)

Day & Date: Thursday, 20-07-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. Nos. 1 and. 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Figure to right indicate full marks.

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

1) Enzymes are _____.
   a) Carbohydrate b) RNA
   c) Proteins d) Fats

2) _____ enzymes are not necessary for survival of bacteria.
   a) Induced b) Contitutive
   c) Allosteric d) All of the above

3) Enzymes, vitamins and hormones can be classified into a single category of biological chemicals because all of them _____.
   a) Aid in regulating metabolism
   b) Are synthesised in organism
   c) Are proteins
   d) Enhance the oxidation metabolism

4) Non protein inorganic component of enzyme is called _____.
   a) Coenzyme b) Cofactor
   c) Apoenzyme d) Holoenzyme

5) _____ is high energy compound.
   a) Glucose b) ATP
   c) Pyruvic acid d) Phosphate

6) Inducible enzymes are produced only in presence of _____.
   a) Repressor b) Subsrate
   c) End product d) Cofactor

7) Carbohydrates are also known as _____.
   a) Hydrates of carbon b) Carbonates
   c) Glycolipids d) Polysaccharides

8) _____ is also known as invert sugar.
   a) Sucrose b) Fructose
   c) Dextrose d) Glucose

9) Glycolysis can occur in _____.
   a) aerobic cells
   b) anaerobic cells
   c) both aerobic and anaerobic cells
   d) neither aerobic and anaerobic cells

10) Glycolysis is also called _____.
   a) PPP cycle b) TCA cycle
   c) C4 cycle d) EMP pathway

B) Write True or False **06**

1) Sugars which differ from each other only around single carbon atom is called epimer.
2) Amino acids are joined by peptide bond.
3) Enzymes are proteins.
4) All proteins are not enzymes.
5) Fat is hydrolysed by the enzyme known as Amylase.
6) Monosaccharides class of carbohydrates is considered as non-sugar.

Q.2 Answer the following **16**

a) Write a short note on Drug metabolism.
b) Write short note on functions of vitamins.
c) Define coenzymes.
d) Alkanes and alkenes.

Q.3 Answer the following **16**

a) Explain Oxidation of hydrocarbons.
b) Describe types and structures of carbohydrates.

Q.4 Answer the following **16**

a) Describe structures and functions of vitamins.
b) Write in details Michaelis and Menten derivations.

Q.5 Answer the following **16**

a) Write on activation energy barrier and the transition state theory.
b) Microbial hormones and their significance

Q.6 Answer the following **16**

a) Write on reversible and irreversible inhibition and significance.
b) Describe structure and classification of amino acids.

Q.7 Answer the following **16**

a) Write role of allosteric enzymes in metabolic regulation.
b) Write on specificity of enzymes.

SLR-SP-3

Seat No.	

Set P

M.Sc. (Semester - I) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Recent Trends in Virology (MSC23103)

Day & Date: Friday, 21-07-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question no. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figure to right indicate full marks.

Q.1 A) Choose correct alternatives. (MCQ) **10**

1) Viruses outside their host survives as _____.
   a) Prophage b) Capsid
   c) Virions d) Capsomer

2) _____ groups of viruses generally at lacks plants.
   a) Riboviruses b) Retroviruses
   c) Rheoviruses d) Enteroviruses

3) The nucleocapsid is covered by an outer membrane like structure called _____.
   a) Capsule b) Enevelope
   c) Slime layer d) Nuclear membrane

4) Plant viruses penetrates host cells through transient ores called _____.
   a) Endo desmata b) Cyto desmata
   c) Proteo desmata d) Ecto desmata

5) Viral genome that integrated in bacterial genome in called _____.
   a) Prophage b) Metaphase
   c) Mixing d) Transformation

6) _____ crystallized and isolated viruses first time.
   a) W.M. Stanely b) L. Pasteur
   c) F.C. Bowden d) K. M. Smith

7) _____ is an antiviral substance produced after viral infection in human.
   a) Lysozyme b) Histamine
   c) Heparin d) Interferon

8) For cultivation of viruses the fertile chicken egg should be incubated for _____ days.
   a) 1-2 b) 3-4
   c) 5-12 d) 21-22

9) Contractile sheath and tail is present in _____ phages.
   a) P_{22} b) T_2
   c) P_1 d) HIV

10) Viruses which causes lysis of bacteria are known as _____ viruses.
   a) Lysogenic b) Lytic
   c) Lipolytic d) Virolytic

B) Write True or False. **06**

1) Common symptoms of viral infections in plants are local lesions and ring sports.
2) The family of Rhabdovirus dae possesses ds DNA.
3) Relenza is an anti influenza drug.
4) Interferon is synthesized by lymphocytes.
5) HAART therapy is used to halt HIV replication.
6) Carcinoma is the cancer of lymphoid tissue.

Q.2 Answer the following.

a) Write short notes an pathogenesis of Adenovirus. **04**
b) Give the ultrastructure of prions. **04**
c) Explain in brief infection by zika virus. **04**
d) Give note on classification of animal viruses **04**

Q.3 Answer the following.

a) Describe in details host and virus factors in evolved in pathogenesis. **08**
b) Describe in detail lytic cycle. **08**

Q.4 Answer the following.

a) Describe in detail cultivation of viruses using embryonated eggs. **08**
b) Describe in detail control of viral infection by vaccines. **08**

Q.5 Answer the following.

a) Describe in detail corona virus infection. **08**
b) Describe in detail pathogenesis of herpes virus. **08**

Q.6 Answer the following.

a) Describe in detail reproduction of animal viruses. **08**
b) Describe in detail pathogenesis of TMV. **08**

Q.7 Answer the following.

a) Describe in detail assay of viruses. **08**
b) Describe in detail oncogenic viruses. **08**

SLR-SP-4

Seat No.	

Set P

M.Sc. (Semester-I) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Research Methodology and Scientific Writing (MSC23108)

Day & Date: Saturday, 22-07-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question no. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figure to right indicate full marks.

Q.1 A) A Choose correct alternative and rewrite the sentence. **10**

1) _____ is not a basic section of a quantitative research paper.
   a) Results b) Methods
   c) References d) Criticisms

2) The information retrieval tool for NCBI GenBank is_____
   a) SATG b) Seqin
   c) Text search d) Entrez

3) The long form of NCBI is_____
   a) National Center for Biology Information.
   b) National Center for Biochemistry Information.
   c) National Center for Biotechnology Information
   d) National Center for Biostat Information.

4) The best research tool for review of literature is_____
   a) your guide b) Library
   c) internet d) sending emails to scientists

5) The main purpose of a "References" section in a scientific paper_____
   a) is to acknowledge your colleagues who gave you advice.
   b) is to present other papers that the reader might want to consult
   c) is to provide a list of scientists who have repeated your research
   d) is to improve one's research impact factor

6) All research process starts with_____
   a) observation b) experiment to test hypothesis
   c) hypothesis d) all of these

7) Laboratory work using computers and computer generated models generally offline is referred as_____
   a) Dry lab b) Web lab
   c) In vitro d) In Silico

8) _____ is NOT a part of IMRAD format.
   a) Introduction b) Discussion
   c) Results d) Acknowledgement

9) The NCBI houses genome sequencing data in_____
   a) GENEBANK b) FASTA
   c) BLAST d) LINUX

10) _____ is NOT a search engine.

a) NIH b) NCBI
c) PUBMED d) Google

B) Write True/false **06**

1) Figures are used in a scientific paper to present and explain research results.
2) The process of peer review DOES NOT ensures that a scientific paper is correct.
3) NCBI stands for National Center for Biotechnological Information
4) Plagiarism is NOT allowed in publishing a scientific document.
5) Letter “A” in IMRAD format stands for Abstract.
6) Google is a search engine.

Q.2 Answer the following **16**

a) Writing a conference report
b) Publication process of scientific pa
c) Write a note on “Acknowledgement” section of manuscript
d) Write a note on Google as search engine

Q.3 Answer the following. **16**

a) Write in detail onlnternet as a tool of research.
b) Comment on importance of PUBMED for literature survey

Q.4 Answer the following. **16**

a) What is scientific writing?
b) Write in detail on softwares used for plagiarism check

Q.5 Answer the following. **16**

a) Comment on Ethics in scientific publications
b) State the importance of NCBI

Q.6 Answer the following. **16**

a) Comment on “Introduction” section of a manuscript
b) Comment how to present a paper orally

Q.7 Answer the following. **16**

a) Explain how to prepare the abstract of the research paper
b) State the role of “Corresponding author” in publication process?

SLR-SP-5

Seat No.	

Set P

M.Sc. (Semester-I) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Biophysics and Bioinstrumentation (MSC23109)

Day & Date: Saturday, 22-07-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question no. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figure to right indicate full marks.

Q.1 A) Choose the correct alternatives. (MCQ) **10**

1) _____ is radioactive.
   a) Vimentin b) Tritium
   c) Deuterium d) Sulfur

2) Principle of Beer-Lambert's law is used in _____.
   a) Colorimeter b) pH meter
   c) Chromatography d) Centrifuge

3) Endoscopic imaging uses _____ sensors.
   a) Thermal b) Chemical
   c) Optic Fiber d) Gas

4) pH meter can be considered as voltage source with _____ internal resistance.
   a) Very low b) Zero
   c) Negative d) Very high

5) The resolving power of TEM is derived from _____.
   a) Specimen b) Electric light
   c) Electrons d) Stains

6) Liquid Scintillation spectrometry is a method of detecting _____ emitters.
   a) Beta b) Alfa
   c) Gamma d) Zeta

7) _____ is used as a fluorescent dye is electrophoresis.
   a) Ninhydrin b) Ethidium bromide
   c) Methylene blue d) Basic Fuchsin

8) _____ converts biochemical event into measurable signals.
   a) Amplifier b) Rectifier
   c) Booster d) Transducer

9) _____ metal is used with nanoparticles for antibiotic delivery.
   a) Gold b) Zink
   c) Silver d) Uranium

10) Unfolding of proteins can be termed as _____.
   a) Denaturation b) Saturation
   c) Conformation d) Installation

B) Write True or False. **06**

1) HEPA filters are used in Biosafety cabinets.
2) Nanoparticles are not synthesized by micro-organisms.
3) Agarose gel electrophoresis is used for separation of DNA.
4) GM counters are used for detecting metals.
5) Proteins are made up of amino acids.
6) Centrifugation is based on principle of light emission.

Q.2 Answer the following **16**

a) Fluorescent Microscope
b) Turbidometry
c) Potentiometry
d) Ramchandran Plot

Q.3 Answer the following.

a) Describe in detail Electron Microscope. **08**
b) Describe the principle and working of Spectrophotometer. **08**

Q.4 Answer the following.

a) Write an essay on Chromatographic technique. **08**
b) Give the principle, working and application of Electrophoresis. **08**

Q.5 Answer the following.

a) Describe in detail protein structure determination by X- ray diffraction. **08**
b) Describe in detail U.V. Visible Spectroscopy. **08**

Q.6 Answer the following.

a) Give in detail principle, working and application of centrifuge. **08**
b) Describe in detail principle, working and applications of nanometry. **08**

Q.7 Answer the following.

a) Write an essay on ORD and CD spectroscopy. **08**
b) Describe in detail pH meter. **08**

SLR-SP-6

Seat No.		Set	P

M.Sc. (Semester - II) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Microbial Genetics (MSC23201)

Day & Date: Wednesday, 19-07-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Figure to right indicate full marks.

Q.1 A) Write the sentences by selecting correct alternative. **10**

1) Rough pneumococci are _____.
   a) Non-capsulated and pathogenic
   b) Non-capsulated and nonpathogenic
   c) Capsulated and pathogenic
   d) Capsulated and nonpathogenic

2) In _____ mutation cause of mutation is not known.
   a) Spontaneous b) Nonsense
   c) Mis-sense d) Suppressor

3) Chemically bacteriocins are _____.
   a) Lipids b) Proteins
   c) Fats d) Carbohydrates

4) Enzymes that remove nucleotides one at a time from the end of a DNA are called _____.
   a) Ligases b) Exonucleases
   c) Endonucleases d) Modifying enzymes.

5) _____ is nothing but probe.
   a) Chemically synthesized DNA
   b) Purified DNA
   c) Fragmented DNA duplex
   d) Either purified or synthesized single stranded DNA

6) Addition of γ-phosphate at 5′ -OH end is function of _____
   a) Polynucleotide oxidase b) Polynucleotide kinase
   c) Polynucleotide lyase d) Polynucleotide reductase

7) During electrophoresis denaturation of the double stranded DNA is brought about by _____
   a) Treatment with alkali b) Use of current
   c) Use of Et Br d) Application of heat

8) Lambda phage DNA replication takes place in _____ phases.
   a) 1 b) 2
   c) 3 d) 4

9) _____ is example of head-and-tail bacteriophage.
   a) M_{13} b) Lambda phage
   c) Pbr_{322} d) M_{16}

10) Transfer of naked DNA from one cell to another cell is called _____

a) Translation b) Lysogeny
c) Conjugation d) Transformation

B) Write true/false **06**

1) Radiolabelling is generally brought about by addition of radioactive phosphorus.
2) Structurally bacteriophages are very simple.
3) Pressure does not affect the formation of hybrid DNA.
4) Fluorescent labelling is an important phenomenon in hybridization and manipulations.
5) The catalytic activity of photolyase in bacterial cell is activated by visible light near blue region.
6) Nucleotide Excision repair is known as Cut and Patch mechanism.

Q.2 Answer the following. **16**

a) Applications of phages in molecular biology.
b) Antisense RNA and its significance.
c) Induction of mutation in yeast.
d) Types of damages and damaging agents.

Q.3 Answer the following. **16**

a) Structure and replication of phage M_{13}
b) Avery experiment

Q.4 Answer the following. **16**

a) Physical characteristics of DNA
b) Deciphering of genetic code and important properties of genetic code.

Q.5 Answer the following. **16**

a) Replication of Lambda phage
b) Lactose operon

Q.6 Answer the following. **16**

a) Genome analysis and it's applications.
b) Role of restriction endonucleases and methylases.

Q.7 Answer the following. **16**

a) Secondary and Tertiary structure of DNA
b) Models of DNA replication

SLR-SP-7

Seat No.	

Set P

M.Sc. (Semester - II) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Microbial Ecology and Diversity (MSC23202)

Day & Date: Sunday, 23-07-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. Nos. 1 and. 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Figure to right indicate full marks.

Q.1 A) Choose the correct alternative. **10**

1) The natural place of an organism or community is known as _____.
   a) Niche b) Biome
   c) Habitat d) Habit

2) In an ecosystem, the flow of energy is _____.
   a) Bidirectional b) Cyclic
   c) Unidirectional d) Multidirectional

3) Major useful product obtained from microbes _____.
   a) Vitamin b) Single-cell protein
   c) Antibiotic d) All of the above

4) Soil microorganisms are most active at _____.
   a) 15-20°C b) 20-25°C
   c) 34-36°C d) 40-45°C

5) Which of the following method can be used to determine the number of bacteria quantitatively?
   a) Streak-plate b) Spread-plate
   c) Pour plate d) Pour plate and spread plate

6) Which of the following are not performed in lyophilization?
   a) agar slant is covered with mineral oil
   b) cell suspension is frozen at -60° to -78° C
   c) vials are connected to a high-vacuum line
   d) bacterial sample is dehydrated

7) The science of studying genomic fragments from microbial communities, allowing researchers to study genes from a collection of multiple species, is called _____.
   a) Pharmacogenomics b) transcriptomics
   c) Metagenomics d) Proteomics

8) Which of the following statement is true for archaebacteria?
   a) Archaebacteria are fossils
   b) Archaebacteria are halophiles
   c) Archaebacteria are photosynthetic
   d) Archaebacteria are old living entities

9) Which of the following are found in extreme saline conditions?
   a) Halophiles b) Thermophiles
   c) Psychrophiles d) None of the above

10) An organism that can synthesize all its required organic components from CO_2 using energy from the sun is a: _____.

a) Photoautotroph b) Photoheterotroph
c) Chemoautotroph d) Chemoheterotroph

B) Write True or False **06**

1) Living things are formed from carbon-containing molecules, so the carbon cycle is the only biogeochemical cycle that affects humans.
2) Dilution of the mixed culture is a common step in all three methods: the streak-plate, the spread-plate, and the pour-plate technique.
3) Barophiles are organisms that grow best under high pressures of 400 atm or more.
4) Xerophiles grow in extremely dry conditions which can be very hot or very cold.
5) Proteomics is based on the concept of the proteome as a complete set of proteins produced by a given cell or organism under a defined-set-of conditions.
6) Methanogens are microorganisms that produce pyruvic acid as a metabolic byproduct in hypoxic conditions.

Q.2 Answer the following **16**

a) Write a short note on microbe-plant interactions.
b) Enlist different levels of microbial diversity and write the information on the Genetic diversity.
c) Write a short note on microbial ecology.
d) Write the basic differences between Acidophiles and Alkalophiles.

Q.3 Answer the following

a) Describe the general characteristics of Methanogenic Archeobacteria. **08**
b) Explain the Importance of conservation of microbial diversity. **08**

Q.4 Answer the following

a) Describe the concept of Biodeterioration. **08**
b) Explain the Whole-genome sequencing method for assessing Microbial Diversity. **08**

Q.5 Answer the following

a) Explain the Metagenomics and proteogenomics. **08**
b) Enlist the Oxygenic photosynthetic microorganisms and write the General characteristics of Cyanobacteria. **08**

Q.6 Answer the following

a) Enlist the various examples of thermophilic bacteria and Explain the general characteristics of thermophiles **08**
b) Explain the various types of Microbial Diversity. **08**

Q.7 Answer the following

a) Enlist various methods of culture-independent methods and write the information on Metatranscriptomics. **08**
b) Describe the concept of Ecosystems, habitats, and ecological niches. **08**

SLR-SP-8

Seat No.	

Set P

M.Sc. (Semester - II) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Microbial Physiology and Metabolism (MSC23206)

Day & Date: Tuesday, 25-07-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. Nos. 1 and. 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Figure to right indicate full marks.

Q.1 A) Choose correct alternative and write sentence again **10**

1) Pyruvate is the precursor for _____.
   a) Alanine b) Glutamate
   c) Serine d) Proline

2) Electron transport system (ETS) is present in which of the following parts of mitochondria?
   a) Inner membrane b) Outer membrane
   c) Matrix d) Stroma

3) _____ uses H_2O_2 as an oxidant (electron acceptor)) to convert peroxide into water and ground-state oxygen.
   a) Catalase b) superoxide dismutase
   c) Hydrolases d) oxidases

4) A single molecule of glucose generates _____ molecules of acetyl CoA, which enters the Krebs cycle.
   a) 4 b) 3
   c) 2 d) 1

5) Regulation of the de-novo synthesis of purine nucleotide depends on the concentration of which compound?
   a) Ribulose-5-phosphate b) PRPP
   c) IMP d) AIR

6) FAD is reduced in which of the reaction of the Kreb's cycle?
   a) Isocitrate to oxaloacetate
   b) Succinyl CoA to Succinate
   c) Fumarate to malate
   d) Succinate to fumarate

7) The basis of reverse osmosis is _____.
   a) Osmotic pressure is greater than the hydrostatic pressure
   b) Osmotic pressure is equal to the hydrostatic pressure
   c) Hydrostatic pressure is greater than the osmotic pressure
   d) Osmotic pressure does not exist

8) Semi-permeable membrane is selective membrane which does not permit the passage of dissolved _____ particles.
   a) Solvent b) Solute
   c) Anhydrous d) Saturated

9) Oxidative phosphorylation results in the formation of _____.
   a) Oxygen b) ADP
   c) ATP + H_2O d) NADH

10) Following are the Phase I reactions during drug metabolism except _____.
   a) Oxidative reactions b) Hydrolytic reactions
   c) Reductive reactions d) Sulphide reactions

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

1) When the transporters transport the substances in opposite direction then they are called _____.
2) The flow of electrons through the electron transport chain is an _____.
3) _____ gives rise to valine and isoleucine.
4) Ubiquinone transfers its electrons to _____.
5) The process of reverse osmosis is also known as _____.
6) The final substrate-level phosphorylation in the pathway is catalyzed by _____.

Q.2 Write in short about the following.

a) Group translocation. **04**
b) Osmotic stress in bacteria. **04**
c) Amphibolic nature of TCA cycle. **04**
d) Structure of mitochondria. **04**

Q.3 Answer the following.

a) Describe in detail about Bacterial Electron Transport Chain. **10**
b) Write a note on facilitated diffusion. **06**

Q.4 Answer the following.

a) Write an essay on Amino acid synthesis pathway. **10**
b) Discuss "Different permeation system in Ecoli". **06**

Q.5 Answer the following.

a) Write an essay on Bacterial Electron Transport Chain. **10**
b) Discuss "De Novo synthesis pathway for purine synthesis". **06**

Q.6 Answer the following.

a) Write an essay on Drug metabolism. **10**
b) Write in detail about Microbial hormones and their significance. **06**

Q.7 Answer the following.

a) Write an essay on TCA cycle. **10**
b) Describe in detail about beta ketoadipate pathway. **06**

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Seat No.	

Set P

M.Sc. (Semester - II) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Medical Microbiology (MSC23207)

Day & Date: Tuesday, 25-07-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. Nos. 1 and. 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Figure to right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) Which factor is used by pathogenic microorganism to resist host defense?
   a) Pectinase reacting factor b) Coagulase reacting factor
   c) Amylase reacting factor d) Protease reacting factor

2) Which structure of bacterial pathogen used to adhere host cells?
   a) Nucleus b) DNA
   c) Fimbria d) Plasma membrane

3) Which acts as endotoxin in pathogenic bacteria?
   a) Lipids b) Carbohydarte
   c) Lipoprotein d) Lipopolysaccharide

4) Which is mode of transmission of Leptospirosis?
   a) Bed Bugs b) Animal's urine
   c) Mosquitos d) Air droplets

5) Which parasitic worm causes pin worm disease in humans?
   a) *Taenia saginata* b) *Ascaris lumbricoides*
   c) *Enterobius vermicularis* d) *Escherichia coli*

6) Which is mode of transmission of Japanese encephalitis virus?
   a) Mosquitos b) Animal's urine
   c) Bed Bugs d) Air droplets

7) Which drug is used for the treatment of Mucormycosis?
   a) Ampicillin b) Tetracycline
   c) Penicillin d) Amphotericin B

8) Which yeast usually infect HIV patient?
   a) *Yarrowia lipolytica* b) *Saccharomyces cerevisiae*
   c) *Candida albicans* d) *Pichia pastoris*

9) Which bacteria mostly causes dental caries?
   a) *E.coli*
   b) *Streptococcus mutans*
   c) *Pseudomonas aeruginosa*
   d) *Helicobacter pylori*

10) Which anticoagulant is used to transport blood sample?
   a) EDTA b) Potassium chloride
   c) Calcium chloride d) Sodium chloride

B) Write true/false. **06**

1) ELISA technique is used for diagnosis of AIDS.
2) Blood sample is used for diagnosis of COVID-19.
3) In Radioimmunoassay (RIA) antigens are labelled with radioactive isotopes.
4) Viral transport media is used for transport swabs for viral disease.
5) Tetracycline inhibits the cell wall synthesis in pathogenic bacteria.
6) Ampicillin is a drug used for the treatment of fungal infection.

Q.2 Answer the following.

a) Write a short note on mechanism of bacterial adhesins. **04**
b) Write a short note on bacterial resistance to humoral defence. **04**
c) Write a short note AIDS and prevalence of Tuberculosis, Mycoplasma. **04**
d) Write a short note on mechanism of action Penicillin. **04**

Q.3 Answer the following.

a) Write in brief about Infectious disease cycle, Characteristics of infectious disease in population. **10**
b) Write a note on descriptive, analytical and experimental epidemiology and measurement of infection rate. **06**

Q.4 Answer the following.

a) Write in brief about peptic ulcer caused by *Leptospira icterohaemorrhagiae,* with respect to pathogenesis, transmission, laboratory diagnosis, prevention and control. **10**
b) Write a note on Anaerobic bacterial infections in Human beings and therapy. **06**

Q.5 Answer the following.

a) Write in brief about infection caused by *Ascaris lumbricoides,* with respect to pathogenesis, transmission, laboratory diagnosis, prevention and control. **10**
b) Write a note on Herpes virus infection. **06**

Q.6 Answer the following.

a) Write in brief about infection, caused by Dengue virus with respect to pathogenesis, transmission, laboratory diagnosis, prevention and control. **10**
b) Write a note on role of extracellular products in fungal infections. **06**

Q.7 Answer the following.

a) Write in brief about various mechanism of action of chemotherapeutic agents used for the treatment of viral disease. **10**
b) Write a note on chemotherapeutic agents for fungal diseases. **06**

SLR-SP-10

Seat No.	

Set P

M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Molecular Biology and Genetic Engineering (MSC023301)

Day & Date: Monday, 10-07-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. Nos 1 and 2 are compulsory.
2) Attempt any Three questions from Q. No.3 to Q. No.7
3) Figures to the right indicates full marks.

Q.1 A) Choose the correct alternatives from the given options. **10**

1) The most widely used vector for DNA library constructions is _____.
   a) plasmid b) lambda phage
   c) YAC d) PAC

2) Genetic code is _____.
   a) overlapping b) non-overlapping
   c) non universal d) ambiguous

3) Nonsense codons are present on _____.
   a) mRNA b) tRNA
   c) rRNA d) None of these

4) Cancer cells shows _____ property.
   a) Unlimited number of cell divisions
   b) Growth without external signals
   c) Avoidance of cell death
   d) All of the above

5) _____ may be the cause cancer.
   a) mutation in a gene that slows the cell cycle
   b) Faulty DNA repair
   c) loss of control over telomere length
   d) All of the above

6) The unique sequence of bases which codes for the production of a unique protein is known as _____.
   a) Exon b) Intron
   c) Regulatory sequence d) None of these

7) Genetic variation can be introduced into bacteria by _____.
   a) transduction b) translation
   c) transcription d) DNA amplification

8) _____ enzyme is involved in DNA replication.
   a) Helicase b) Primase
   c) DNA polymerase d) RNA polymerase

9) _____ are soluble.
   a) DNA b) mRNA
   c) rRNA d) tRNA

10) _____ are present on tRNA.
a) Codons b) Initiation codons
c) Termination codons d) Anti codons

B) Write true or false. **06**

1) Ligase enzyme used for seal or join DNA.
2) Codons present on tRNA.
3) Southern blotting used for protein sequencing.
4) Genetic engineering can be used to identify genes for specific traits.
5) A ring of DNA in a bacterium is called a plasmid.
6) Restriction enzyme Hind II was extracted from Haemophilus influenza.

Q.2 Answer the following. **16**

a) Write short note on phagemid vectors.
b) Write short note on Cosmid vectors.
c) Write short on linkers and adaptors.
d) Define restriction endonuclease enzyme.

Q.3 Answer the following. **16**

a) Describe polymerase chain reaction
b) Explain southern blotting technique.

Q.4 Answer the following. **16**

a) Describe cell homeostasis and cell cycle.
b) Describe Protein engineering.

Q.5 Answer the following. **16**

a) Explain in details on construction of rDNA.
b) Write in details on RFLP.

Q.6 Answer the following. **16**

a) Write in details on recombination.
b) Describe Genomic libraries and cDNA libraries.

Q.7 Answer the following. **16**

a) Write in details on DNA sequencing.
b) Describe applications of Genetic engineering in Agriculture.

SLR-SP-11

Seat No.		Set	P

M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Bioprocess Technology and Fermentation Technology (MSC023302)

Day & Date: Tuesday, 11-07-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. No. 1 & 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Draw neat labeled diagrams

Q.1 A) Choose correct option. **10**

1) _____ is used as test organism for penicillin bioassay.
   a) *E. coli* b) *S. typhi*
   c) *V. cholerae* d) *S. qureus*

2) Carcinogenicity testing is carried out by _____ test.
   a) Bruce Ames b) Weil Felix
   c) Widal d) ELISA

3) Preservation of cultures by liquid nitrogen is called _____.
   a) Lyophilization b) Cryopreservation
   c) Desiccation d) Freeze drying

4) Waste product from dairy industry is called _____.
   a) Molasses b) SWL
   c) Whey d) CSL

5) Quality Assurance of the product must by given by _____.
   a) Manufacture b) Distributor
   c) Doctor d) Government

6) Generally _____ media are used actually for large scale production of any product.
   a) Synthetic b) Artificial
   c) Crude d) Inoculum

7) _____ is used for strain improvement.
   a) Lyophilization b) Assay
   c) Serial dilution d) Genetic Engineering

8) _____ is organism used for streptomycin production.
   a) Streptococcus lactis
   b) Streptomyces griseus
   c) Penicillium Chrysogenum
   d) Streptococcus cremoris

9) ____ technique is used for primary screening of Antibiotic producers
   a) Serial dilution b) Crowded plate
   c) Indicator plate d) Pour plate

10) The term Intellectual Property Rights covers _____.
a) Copyrights b) Trade dress
c) Trademark d) All of these

B) Write True or False. **06**

1) Streptomycin is narrow spectrum antibiotic.
2) Mice are used for toxicity testing.
3) Molasses is waste from dairy industry.
4) Leuconostoc mesenteroides is used for production of Dextran.
5) Whisky is non distilled alcoholic beverage.
6) Vitamin B_{12} is also called as cyanocobalamin.

Q.2 Answer the following **16**

a) Give the concept of primary metabolite.
b) Explain the pyrogenicity testing of product.
c) Give the concept of Bioethics.
d) Write note on Xanthan gum.

Q.3 Answer the following.

a) Describe in detail streptomycin fermentation. **08**
b) Describe different types of fermenters. **08**

Q.4 Answer the following.

a) Explain various Biosensors used for maintaining environmental parameters. **08**
b) Explain in detail primary screening of Antibiotic producers. **08**

Q.5 Answer the following.

a) Explain in detail production of Brandy. **08**
b) Describe in detail Good Manufacturing Practices. **08**

Q.6 Answer the following.

a) Give in detail industrial production of Anaylase. **08**
b) Write on Genetically modified foods. **08**

Q.7 Answer the following.

a) Describe in detail Assay testing. **08**
b) Write in detail on fermentation media. **08**

SLR-SP-12

Seat No.	

Set P

M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Immunology and Immunotechnology (MSC023306)

Day & Date: Wednesday, 12-07-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. Nos. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Figure to right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) _____ immunity involves transfer of ready-made antibodies.
   a) Active b) Passive
   c) Innate d) Genetic

2) _____ immunoglobulin is called secretary antibody.
   a) Ig A b) Ig G
   c) Ig E d) Ig M

3) Tears contains _____ as an antimicrobial substance.
   a) Heparin b) HCl
   c) Lysozyme d) Antibiotic

4) The dendritic cells were discovered by _____.
   a) Peter Medwar b) Barry Marshal
   c) David Baltimore d) Ralph Steinman

5) Blood Group antigens represents best examples of _____.
   a) Isoantigens b) Sequestered antigens
   c) Autoantigens d) Xenoantigens

6) The clonal selection theory for antibody formation was proposed by _____.
   a) Carpeter b) Roit
   c) Burnett d) Darwin

7) _____ is used to detect and amplify an antigen-antibody reaction.
   a) Colorimeter b) ELISA
   c) Chromatography d) Colony counter

8) Cytokines are _____.
   a) Antigens b) Polysaccharides
   c) Carbohydrates d) Proteins

9) Widal Test is used for diagnosis of _____.
   a) Typhoid b) Malaria
   c) Flu d) Jaundice

10) Cell mediated immunity is carried out by _____.
   a) B-cells b) RBC
   c) T-cells d) Thrombocytes

B) Write True or False **06**

1) Human sperm is an example of sequestered antigens.
2) Rheumatoid Arthritis is not auto immune disease.
3) T-cells matures in Thymus.
4) Monoclonal antibodies recognize multiple antigens.
5) An epitope is antigen determinant site.
6) Hepatitis B vaccine is combined vaccine.

Q.2 Answer the following **16**

a) Describe structure and function of Thymus.
b) Describe autoimmune hemolytic anemia.
c) Note on Homograft rejection.
d) Describe Agglutination Reactions.

Q.3 Answer the following

a) Describe mechanism and applications of ELISA Tests. **08**
b) Describe in detail Primary immune deficiency. **08**

Q.4 Answer the following

a) Describe the immune response to bacterial diseases. **08**
b) Describe in detail immunoglobin gene structure. **08**

Q.5 Answer the following

a) Give the classification of common vaccines. **08**
b) Describe in detail Immunoelectrophoresis. **08**

Q.6 Answer the following

a) Describe in detail cell mediated immunity. **08**
b) Write an essay on Major Histocompatibility. **08**

Q.7 Answer the following

a) Describe in detail Active immunization. **08**
b) Describe various immunoglobulin types and their properties. **08**

SLR-SP-14

Seat No.		Set	P

M.Sc. (Semester - IV) (New) (CBCS) Examination March/April-2023
MICROBIOLOGY
Pharmaceutical Microbiology (MSC023401)

Day & Date: Monday, 10-07-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question 1 and 2 are compulsory.
2) Attempt any Three from Q.3 to Q.7
3) All questions carry equal marks.
4) Draw neat and labeled diagrams wherever necessary.

Q.1 A) Choose the correct alternatives from the given options. **10**

1) _____ biosensors are responsible for distribution of charges which results in production of electrical potential.
   a) Calorimetric b) Potentiometric
   c) Optical d) Amperometric

2) Ophthalmic solution is sterilized by _____.
   a) Autoclave b) Hot air oven
   c) Radiations d) Filters

3) _____ is contraindicated during pregnancy.
   a) Ciprofloxacin b) Pefloxacin
   c) Norfloxacin d) Amikacin

4) _____ is primary route of administration of insulin.
   a) Intradermal b) Intramuscular
   c) Subcutaneous d) Intravenous

5) Benzalkonium chloride is _____.
   a) acidic preservative
   b) neutral preservative
   c) mercurial preservative
   d) quaternary ammonium compound

6) Good manufacturing practice regulation is _____.
   a) Followed by manufacturing companies
   b) Only followed by MNCs
   c) Followed in Laboratories only
   d) Followed in cosmetics

7) _____ is naturally occurring plasminogen activator in beta-hemolytic *streptococcus*.
   a) Streptolysin b) Streptokinase
   c) Streptolyase d) Streptoreductase

8) By _____ process new drug is formulated.
   a) Licensing b) R & D
   c) Manufacturing d) Marketing

9) _____ sets the rules for clinical trials.
   a) National Health Service (NHS)
   b) National Institute of Health (NIH)
   c) New Drug Administration (NDA)
   d) Food and Drug Administration (FAD)

10) _____ is common side effect of beta-lactam antibiotics.
   a) Hearing loss b) Aplastic anemia
   c) Allergic reaction d) Yellowing of teeth

B) True or false. **06**

1) Immobilized enzymes are more preferred over free enzymes in producing biosensors.
2) DPT is combination vaccine.
3) Penicillin causes inhibition of my coplasma.
4) Phenol is first widely used antiseptic and disinfectant.
5) Pregnancy test and glucose monitoring sensor are the two main examples of very successful biosensor devices.
6) Many antibiotics inhibit the growth of bacteria by targeting protein biosynthesis.

Q.2 Answer the following. **16**

a) Write about biosensors and its applications in pharmaceutical industry.
b) What is DNA vaccine? Give examples.
c) Write about safety rules in microbiology lab.
d) What is GMP and GLP?

Q.3 Answer the following. **16**

a) Write in detail about microbial contamination and spoilage of pharmaceutical products.
b) Give detail account on mode of action of quinolones and aminoglycosides.

Q.4 Answer the following. **16**

a) Write in detail about FAD policies and rational drug design.
b) What are antitumor substances? Explain with example.

Q.5 Answer the following. **16**

a) Explain in detail mode of action of non-antibiotic antimicrobials.
b) Explain in detail microbial fermentations of streptokinase and streptodornase.

Q.6 Answer the following.

a) Write an essay on Drug delivery system. **10**
b) Write short note on drug carries. **06**

Q.7 Answer the following.

a) Write in detail about cell wall synthesis inhibitors and nucleic acid synthesis inhibitors. **10**
b) Write in short about multivalent submit vaccine. **06**

SLR-SP-15

Seat No.	

Set P

M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Food and Dairy Microbiology (MSC023402)

Day & Date: Wednesday, 12-07-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. Nos. 1 and. 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7
3) Figure to right indicate full marks.

Q.1 A) Choose the correct altrernative. **10**

1) The ratio of vapour pressure of solution to vapour pressure of solvent is called as _____.
   a) Water pressure b) Water activity
   c) Available water d) both b and c

2) _____ is natural inhibitory substance present in egg white.
   a) Lactenins b) Lysozyme
   c) Benzoic acid d) Albumin

3) Bacterial soft rot is caused by _____.
   a) *Erwinici carotovora* b) *Pseudomonas marginalis*
   c) Both a and b d) *Botrytis allii*

4) In spoilage of fresh beef, whiskers are produced by _____.
   a) Thamnidium b) Mucor
   c) Rhizopus d) All of the above

5) _____ is not the principle of food preservation.
   a) Prevention or delay of microbial decomposition.
   b) Prevention or delay of self decomposition of food.
   c) Prevention of damage caused by insects, animals and by mechanical means.
   d) Proliferating growth and activity of microorganisms.

6) _____ is called as father of canning.
   a) Louis Pasteur b) John Tyndall
   c) Nicolas Appert d) Robert Koch

7) _____ is responsible for primary ripening of blue cheese.
   a) *Streptococcus lactis* b) *Streptococcus cremoris*
   c) *Penicillium- roqueforti* d) *Penicillium notatum*

8) _____ starter culture is used for yogurt manufacturing.
   a) *Lactobacillus bulgaricus* b) *Streptococcus thermophilus*
   c) Both a and b d) *Streptococcus lactis*

9) Swelling of the can is caused primarily by _____.
   a) Gas forming, anaerobic spore formers
   b) Gas forming aerobic spore formers
   c) Both a and b
   d) None of these

10) The blue colour in milk is developed due to growth of _____.
   a) *Pseudomonas synxantha* b) *Pseudomonas syncanea*
   c) *Streptococcus lactis* d) *Flavobacterium sp*

B) Fill in the blanks **06**

1) Oxidation-Reduction potential of a system is expressed by the symbol _____.
2) A type of spoilage in which anaerobic decomposition of protein leads to formation of off odour and formation of hydrogen sulphide, Mercaptans... etc. is called as _____.
3) The food borne illness caused by entrance of bacteria into the body through ingestion of contaminated food is called as _____.
4) FSSAI stands for _____.
5) Rennet contains _____ and _____ two principal enzymes.
6) For Idli Manufacturing _____ and _____ are used as raw material.

Q.2 Answer the following **16**

a) Write note on spoilage of packed food.
b) Differentiate between Food Poisoning and Food Infection
c) Write in short about microbial flavours used in food and dairy industry.
d) Enlist the general principles underlying preservation of milk and write in short about pasteurisation.

Q.3 Answer the following **16**

a) Describe in detail about food as substrate for microorganisms.
b) Write in detail about composition and nutritive value of milk.

Q.4 Answer the following **16**

a) Enlist the various methods of food preservation and describe in detail about salting, canning and radiation.
b) Describe in detail about the production technology and defects of yogurt.

Q.5 Answer the following **16**

a) Define platform test and describe in detail about various platform tests used in dairy industry.
b) Describe in detail about microbiology and production technology for Jilebi and Idli manufacturing.

Q.6 Answer the following **16**

a) Describe in detail about various sources of contamination of milk.
b) Write in detail about spoilage of meat and meat products.

Q.7 Answer the following **16**

a) Describe in detail about role and importance of HACCP and FSSAI in food and dairy industry.
b) Describe in detail about manufacturing technology for Cheddar cheese.

SLR-SP-16

Seat No.	

Set P

M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Principles of Bioinstrumentation and Technique (MSC023403)

Day & Date: Friday, 14-07-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question no. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figure to right indicate full marks.

Q.1 A) Choose correct alternative and write the sentence again. **10**

1) Which of the following statements is not true about mass spectrometry?
   a) Impurities of masses different from the one being analysed interferes with the result
   b) It has great sensitivity
   c) It is suitable for data storage
   d) It is suitable for library retrieval

2) According to the small size of the particle, which type of chromatographic separation is applicable?
   a) High- performance liquid chromatography (HPLC)
   b) Fast protein liquid chromatography (FPLC)
   c) Gel chromatography
   d) Paper chromatography

3) Beer Lambert's law gives the relation between which of the following?
   a) Reflected radiation and concentration
   b) Scattered radiation and concentration
   c) Energy absorption and concentration
   d) Energy absorption and reflected radiation

4) Electrophoresis is not used for_____.
   a) Separation of proteins b) Separation of amino acids
   c) Separation of Lipids d) Separation of nucleic acids

5) The depurination treatment in blotting, involves the use of HCI and__.
   a) Alkali b) Acid
   c) Proteins d) Nucleic acids

6) Separation of ions in mass spectrometer take place on the basis of which of the following?
   a) Mass b) Charge
   c) Molecular weight d) Mass to charge ratio

7) Southern blotting is_____.
   a) Attachment of probes to DNA fragments
   b) Transfer of DNA fragments from electrophoretic gel to a nitrocellulose sheet
   c) Comparison of DNA fragments to two sources
   d) Transfer of DNA fragments to electrophoretic gel from cellulose membrane

8) _____ is used as a media for density gradient.
   a) Agarose b) Ficoll
   c) Luria broth d) Propylene glycol

9) NMR spectroscopy indicates the chemical nature of the_____ and spatial positions of_____.
   a) Electrons, Protons b) Neutrons, electrons
   c) Nuclei, electrons d) Nuclei, neighboring nuclei

10) Which of the following is not a feature of carrier gas used in gas chromatography?
   a) It must be chemically inert
   b) It should be suitable for the detector employed
   c) It should not be completely pure
   d) It should be cheap

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

1) Column chromatography is based on the principle of____.
2) Centrifugation is based on____.
3) The secondary electrons radiated back in scanning microscope is collected by ____.
4) In Atomic Absorption Spectroscopy ____ is the generally used as radiation source.
5) NMR is the study of the absorption of ____ by nuclei in a magnetic field.
6) Electrophoresis was developed by _____.

Q.2 Answer the following. **16**

a) Principal and application of phase contrast microscopy.
b) ion exchange resins.
c) Basic principal of Centrifugation
d) Southern blotting.

Q.3 Answer the following.

a) Principle Methodology and applications of Gel filtration chromatography. **10**
b) Principle and applications of NMR spectroscopy. **06**

Q.4 Answer the following.

a) Atomic absorption and plasma emission spectroscopy. **10**
b) Basic components of electron microscopes. **06**

Q.5 Answer the following.

a) Principle and application of SDS PAGE Electrophoresis. **10**
b) Principle and application of X ray diffraction. **06**

Q.6 Answer the following.

a) Principle and application of density gradient centrifugation. **08**
b) Principle and application of Southern blotting. **08**

Q.7 Answer the following.

a) Principle Methodology and applications of affinity chromatography. **10**
b) Differences between light and compound microscopes. **06**

SLR-SP-17

Seat No.	

Set P

M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2023
Microbiology
Health Care and Diagnostic Microbiology (MSC023409)

Day & Date: Sunday, 16-07-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question no. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 6.
3) Figure to right indicate full marks.

Q.1 A) Choose correct alternative. **10**

1) Which structure of bacterial pathogen used to adhere host cells?
   a) Nucleus b) Fimbriae
   c) Flagella d) Plasma membrane

2) Which enzyme used as an antiphagocytic factor by pathogenic bacteria?
   a) Coagulase b) Amylase
   c) Cellulase d) Protease

3) Which acts as a living reservoir of pathogenic viruses?
   a) Soil b) Water
   c) Insects d) Bats

4) Which test is used for diagnosis of Mycobacterium tuberculosis infection?
   a) ELISA
   b) WIDAL test
   c) Mantoux tuberculin skin test
   d) VDRL test

5) Which test is used for diagnosis of diarrheagenic E.coli infection?
   a) VDRL test
   b) WIDAL test
   c) Mantoux tuberculin skin test
   d) HEp-2 adherence assay

6) Which test is used for diagnosis of *Leptospirosis*?
   a) VDRL test
   b) Microscopic agglutination test MAT
   c) Mantoux tuberculin skin test
   d) HEp-2 adherence assay

7) Which bacteria causes urinary tract disease?
   a) *Corynebacterium diphtheriae*
   b) *Streptococcus pneumoniae*
   c) E.coli
   d) *Helicobacter pylori*

8) Which organ involved in Legionellosis disease?
   a) Heart b) Lungs
   c) Urinary bladder d) Liver

9) Which bacteria causes epidemic typhus fever?
   a) *Corynebacterium diphtheria*
   b) *Helicobacter pylori*
   c) *Salmonella typhi*
   d) *Rickettsia prowazekii*

10) Immunoblotting method of diagnosis involved which method?
   a) Eastern blotting b) Western blotting
   c) Southern blotting d) Northern blotting

B) Write true or false. **06**

1) Echinococcus granulosus is a protozoal species causes hydatid disease in humans.
2) *Ascaris lumbricoides* is the "large roundworm" that cause disease ascariasis in humans.
3) *Wuchereria bancrofti* is a protozoal species transmitted by bed bugs in humans.
4) COVID-19 is diagnosed by ELISA technique.
5) Mumps virus has single stranded RNA as a genome.
6) Histoplasmosis is a fungal infection that affect the lungs.

Q.2 Answer the following.

a) Explain in brief about stages of clinical infections, types of infections, signs and symptoms. **10**

b) Write a short note on normal flora of human body. **06**

Q.3 Answer the following.

a) Write in brief on diagnosis of Leishmaniasis, Trepanosomacruzi, Plasmodium. **10**

b) Write a short note on Genotypic method of disease diagnosis. **06**

Q.4 Answer the following.

a) Write in brief about gonorrhea by Legionellosis, with respect to etiological agent, mode of transmission, symptoms, epidemiology, laboratory diagnosis, prophylaxis and treatment. **10**

b) Write a short note bacterial meningitis. **06**

Q.5 Answer the following.

a) Write in brief about lymphatic filariasis with respect to etiological agent, mode of transmission, symptoms, life cycle of parasite, laboratory diagnosis, prophylaxis, treatment. **10**

b) Write a short note on mode of symptoms, diagnosis and treatment of Giardia lamblia infection. **06**

Q.6 Answer the following.

a) Write in brief about polio with respect structure of Polio virus, clinical manifestations, transmission, laboratory diagnosis, prophylaxis, treatment. **10**

b) Write a short note on mode of symptoms, diagnosis and treatment of Histoplasmosis. **06**

SLR-SP-18

Seat No.		Set	P

M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Recombinant DNA Technology (MSC023410)

Day & Date: Sunday, 16-07-2023 Max. Marks: 80
Time: 03:00 PM To 06:00 PM

Instructions: 1) Question no. 1 and 2 are compulsory.
2) Attempt any three questions from Q. No. 3 to Q. No. 7.
3) Figure to right indicate full marks.

Q.1 A) Choose the correct alternative. (MCQ) **10**

1) Blunt end ligation of DNA is carried out by ____ enzyme.
   a) DNA polymerase b) Endonuclease
   c) E.coli DNA ligase d) T4 ligase

2) S1 nuclease is an endonuclease that mostly cleaves ____.
   a) Amino acid chain b) Double-stranded RNA
   c) Single-stranded DNA d) Double-stranded DNA

3) _____ enzyme have Klenow fragment.
   a) Phosphatase b) DNA polymerase I
   c) E.coli DNA ligase d) T4 ligase

4) The term 'endonuclease' refers to cutting the DNA sequence from ____.
   a) only within the polynucleotide chain, not at the ends
   b) The ends of the chain
   c) anywhere in the chain
   d) exactly in the middle of the chain

5) ____ enzyme transfers the phosphate from ATP to the 5' end of the DNA.
   a) DNA ligase b) Polynucleotide Kinase
   c) Alkaline Phosphatase d) DNA polymerase

6) ____is used to make cells competent for the transformation of Plasmid DNA.
   a) Magnesium chloride b) Potassium chloride
   c) Sodium chloride d) Calcium chloride

7) Which of the following properties is not taken into account while looking for a suitable vector?
   a) Size b) Parent organism
   c) Restriction site d) Origin of replication

8) In genetic engineering, the antibiotics are used ____.
   a) as selectable markers
   b) to select healthy vectors
   c) as sequences from where replication starts
   d) to keep the cultures free of infection

9) Polymerase chain reaction technology (PCR) is used for ____.
   a) DNA identification b) DNA amplification
   c) DNA repair d) cleaving DNA

10) BAC vector is preferred because it contains ____.
a) F factor b) selectable marker
c) cloning sites d) all of these

B) True or false questions. **06**

1) In agarose gel electrophoresis, DNA will be attracted to the negative electrode.
2) The DNA microarray is a tool used to determine whether the DNA from a particular individual contains a mutation in genes like BRCA1 and BRCA2.
3) Restriction fragment length polymorphism (abbreviated RFLP) refers to differences (or variations) among people in their DNA sequences at sites recognized by restriction enzymes.
4) DNA sequencing is the process of determining the nucleic acid sequence and the order of nucleotides in DNA.
5) PCR is fundamental to many of the procedures used in genetic testing and research, including analysis of ancient samples of DNA and identification of infectious agents.
6) The Tumor inducing or Ti plasmid is present in the bacterium *Escherichia coli*.

Q.2 Answer the following. **16**

a) Write a short note on the advantages of genetic engineering.
b) Enlist different types of restriction endonucleases and write the information on restriction endonuclease type -II.
c) Write the various properties of the molecular cloning vector.
d) Write a short note on the cDNA Library.

Q.3 Answer the following.

a) Enlist all enzymes used in the preparation of rDNA and explain the role of Alkaline phosphatase and Polynucleotide kinase in genetic engineering. **08**
b) Describe in detail the action of DNA Ligase. **08**

Q.4 Answer the following.

a) Describe the PBR 322 plasmid vector construction and its derivatives. **08**
b) Explain the role of rDNA technology in the production of recombinant Insulin. **08**

Q.5 Answer the following.

a) Enlist all DNA sequencing methods and explain the Sanger sequencing method. **08**
b) What is RFLP and describe its role in forensic science. **08**

Q.6 Answer the following.

a) Explain DNA Microarray with its principle, methodology, and advantages. **08**
b) Describe the role of rDNA technology in Gene therapy. **08**

Q.7 Answer the following.

a) Enlist various methods of screening for protein expression and explain in detail the western blotting method. **08**
b) Describe in detail the Agarose Gel electrophoresis technique. **08**