SLR-EZ-1

Seat No.	

Set P

M.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Cytology and Taxonomy of Microorganisms (MSC01101)

Day & Date Friday, 05-01-2024 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 correct alternative. **10**

1) Ectomycorrhizas consist of _____.
   a) Hyphal sheath b) Mantle
   c) Covering the root tip d) All of these

2) Soredia are formed during reproduction in _____.
   a) Rickettsia b) Viruses
   c) Lichens d) Actinomycetes

3) The fungal component of lichen is called as _____.
   a) Mycobiont b) Phycobiont
   c) Ascolichen d) Both a & b

4) _____ does not contain cell wall.
   a) Bacteria b) Mycoplasma
   c) Algae d) Fungi

5) _____ bacteria have one flagellum at one end.
   a) Amphitrichous b) Peritrichous
   c) Lophotrichous d) Monotrichous

6) Rickettsia's shows characters of both bacteria & _____.
   a) Algae b) Fungi
   c) Viruses d) Protozoa

7) The study of algae is known as _____.
   a) Mycology b) Phycology
   c) Phycologist d) Both b & c

8) _____ is connecting link between bacteria & fungi.
   a) Actinomycetes b) Algae
   c) Viruses d) Rickettsia

9) Fungi which exist both in unicellular & hyphal form are called _____.
   a) Holocarpic b) Eucarpic
   c) Saprophytic d) Dimorphic

10) Volume 2 of current edition of Bergey's Manual of systematic bacteriology deals with _____.
   a) Archaebacteria b) Proteobacteria
   c) Spirochaetes d) Planctomycetes

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

1) Fungi are green in colour so they are autotrophic.
   a) True b) False
2) The pigment chlorophyll-a is responsible for the characteristic of red colouration in the red algae.
   a) True b) False
3) The 'Father of lichenology' is known as Acharius.
   a) True b) False
4) During attachment process of virion to animal cell the molecules which are present on viruses are called as receptors.
   a) True b) False
5) In translational process capping at 5'end & a poly(A) sequence at the 3' end play key roles in the initiation of translation.
   a) True b) False
6) Repressor proteins are proteins that bind at promoter site and block the binding of RNA polymerase at promoter site and inhibit the transcription of genes
   a) True b) False

Q.2 Answer the following **16**

a) Define symbiotic association between algae & fungi.
b) Define lytic cycle & lysogenic cycle of bacteriophages.
c) Write a note on fruiting body in Myxobacteria.
d) What are the different locations of virus genome replication in eukaryotic cells?

Q.3 Answer the following

a) Explain in detail about characteristics of mycorrhizae. **10**
b) Write a note on entry of animal viruses into host cell. **06**

Q.4 Answer the following

a) Explain in detail all about reproduction of fungi. **10**
b) Explain in detail about lytic cycle of T4 bacteriophage. **06**

Q.5 Answer the following.

a) Explain in detail about transcription & post transcriptional changes of virus genomes. **10**
b) Explain in detail classification of lichen based on thallus morphology. **06**

Q.6 Answer the following.

a) Describe the general characteristics & molecular architecture of cyanobacteria. **10**
b) Explain in detail about morphology & ultrastructure of viroids. **06**

Q.7 Answer the following.

a) Describe in detail cell division & cell cycle in bacteria. **10**
b) Describe in detail life cycle of chlamydia. **06**

SLR-EZ-2

Seat No.		Set	P

M.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Microbial Genetics (MSC01102)

Day & Date: Sunday,07-01-2024 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 correct alternative. **10**

1) When transformation of R-strain to S-strain observed in Avery, MacLeod and McCarty's experiment?
   a) When heat killed S-strain cell's extract is mixed with lipase
   b) When heat killed S-strain cell's extract is mixed with ribonuclease
   c) When heat killed S-strain cell's extract is mixed with protease
   d) When heat killed S-strain cell's extract is mixed with deoxyribonuclease

2) Which molecular biology technique employs melting temperature of DNA?
   a) PCR b) Gel electrophoresis
   c) Southern blotting d) Northern blotting

3) What is the role of F-pili in conjugation?
   a) F-pili acts as channel for transfer of F-Plasmid to recipient cell
   b) F-pili establish contact between donor and recipient cell and pull together both cells
   c) F-pili acts as recognition signals for conjugation
   d) F-pili help to replicate F-plasmid

4) What is a special characteristic of Retroposons?
   a) It uses Helicase enzyme
   b) It uses DNA polymerase enzyme
   c) It uses RNA polymerase enzyme
   d) It uses reverse transcriptase enzyme

5) How will you identify gene cloned in *E.coli* cells by blue-white screening technique?
   a) By observing pink colonies
   b) By observing white colonies
   c) By observing blue colonies
   d) By observing yellow colonies

6) Which enzyme is mainly involved synthesis of DNA replication?
   a) Restriction endonuclease b) RNA polymerase
   c) DNA polymerase d) Protease

7) Which process involved in post-transcriptional modification of mRNA?
   a) Addition of poly-thymine tail at both ends of mRNA.
   b) Addition of poly-adenine tail at one end of mRNA.
   c) Addition of poly-adenine tail at both ends of mRNA
   d) Addition of poly-thymine tail at one end of mRNA

8) How Lambda phage inserts its DNA through tail in the *E.coli* cell?
   a) Though tail
   b) Through protein coat
   c) Through pili
   d) Through flagella

9) How the 'sphaeroplast' degraded to lyse the cell during plasmid purification?
   a) By treating sphaeroplast with HCl
   b) By treating sphaeroplast with lysozyme.
   c) By treating sphaeroplast with SDS.
   d) By treating sphaeroplast with Triton X-100.

10) What is observed positive 'Ames test'?
   a) The histidine negative mutation in *Salmonella typhimurium* strain.
   b) The reversion of prototrophic strain of *Salmonella typhimurium* to auxotrophic strain
   c) The reversion of auxotrophic strain *Salmonella typhimurium* to prototrophic strain
   d) The alanine positive mutation in *Salmonella typhimurium* strain

B) Write True or False **06**

1) Streptococcus pneumoniae used in Griffith's experiment.
2) Melting temperature is used in agarose gel electrophoresis
3) Lysozyme is used to break the DNA.
4) UV radiation is a DNA damaging agents
5) Transduction is done by bacteriophages.
6) Conjugation required flagella.

Q.2 Answer the following **16**

a) Write a short note on tertiary structure of DNA.
b) Write a short note on C-Value paradox.
c) Write a short note on process of transpositions.
d) Write a short note on DNA denaturation and renaturation.

Q.3 Answer the following

a) Explain in brief about Griffith experiment. **10**
b) Write a short note on organization of eukaryotic genome. **06**

Q.4 Answer the following

a) Write a short note on theta and rolling circle model of DNA replication. **10**
b) Write a short note on DNA damaging agents. **06**

Q.5 Answer the following

a) Write in brief about conjugation. **10**
b) Write a short note on blue white screening of plasmids. **06**

Q.6 Answer the following.

a) Write in brief about arabinose operon. **10**
b) Write a short note on post-translational modification. **06**

Q.7 Answer the following

a) Write in brief about structure and life cycle T4 bacteriophage. **10**
b) Write a short note on Structure M13 bacteriophage. **06**

SLR-EZ-3

Seat No.	

Set P

M.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Microbial Physiology and Metabolism (MSC01103)

Day & Date: Tuesday, 09-01-2024 Max. Marks: 80
Time: 03:00 PM To 6:00 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 Choose correct alternative. **16**

1) In emergency stress reaction to limit water efflux. Cell modifies to increase influx of _____.
   a) Na+ b) Cl
   c) K+ d) HCO_3

2) If cell place in hypertonic solution after some time cell should be _____.
   a) Shrink b) Burst
   c) Survive d) Grow

3) Acetyl CoA is a precursor for _____.
   a) Carbohydrate synthesis b) Nucleic acid synthesis
   c) Fatty acid synthesis d) Protein synthesis

4) Anaplerotic reaction occurs in mammalian _____.
   a) Liver and kidney b) Brain and kidney
   c) Kidney and Muscle d) Liver and Brain

5) _____ carrier protein in fatty acid biosynthesis.
   a) Lipoate b) Biotin
   c) Fe Protein d) Acyl carrier protein

6) Skeletal muscle and adipose tissue have _____ as glucose transporter.
   a) GLUT3. b) GLUT1.
   c) GLUT2. d) GLUT4.

7) In Z scheme energy compound are _____.
   a) FADH, ATP b) NADH, ATP
   c) NADPH, ATP d) ATP

8) The end product of glycolysis under aerobic conditions is _____.
   a) Pyruvate b) Lactate
   c) None of these d) Both A and B

9) How many carbons of the purine ring are contributed by the folate one carbon pool during purine biosynthesis?
   a) 0 b) 2
   c) 1 d) 4

10) Production of one ATP is possible in ATP synthase to allow _____.
   a) 10 H+ b) 3 H+
   c) 5 H+ d) 6 H+

11) Glucose is breakdown in to two Molecule of pyruvate as end product in glycolysis.
a) True b) False

12) Aspartate is Contribute the nitrogen atom to both purine and pyrimidine ring?
a) True b) False

13) TCA cycle processes was Occurs in mitochondria.
a) True b) False

14) Pyruvate dehydrogenase is not a NAD+ requiring enzyme.
a) True b) False

15) Brown fat is located in Adipose tissue.
a) True b) False

16) In case of Non Cyclic flow there is no ATP generation.
a) True b) False

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

a) Explain endosymbiotic theory of Mitochondria.
b) Write a note on PDH enzyme reaction.
c) Write a note on glycerol 3-phosphate shuttle.
d) Explain in short saturated fatty acid biosynthesis.

Q.3 Answer the following.

a) Explain in brief Denovo pathway for nucleic acid biosynthesis. **10**
b) Write a note on aromatic amino acid biosynthesis. **06**

Q.4 Answer the following.

a) Define the term detoxification and explain its mechanism. **10**
b) Write a note on Non cyclic flow of ETC. **06**

Q.5 Answer the following.

a) Define diffusion and explain with example of Active transport system. **10**
b) Write a note on oxidation of fatty acid. **06**

Q.6 Answer the following.

a) Explain in brief glycolysis and explain substrate level phosphorylation in glycolysis. **10**
b) Write a note on Malate aspartate shuttle. **06**

Q.7 Answer the following.

a) Explain in brief the mechanism of P type and F type of pumps. **10**
b) Write a note on complex involved in ETC. **06**

SLR-EZ-4

Seat No.	

Set P

M.Sc. (Semester - I) (Old) (CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Bioinstrumentation and Biotechniques (MSC0108)

Day & Date: Thursday, 11-01-2024 Max. Marks: 80
Time: 03:00 AM 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) Figures to the right indicate full marks.

Q.1 A) Choose correct alternative. (Each question carries 2 marks) **10**

1) Which of the following instrument can be used to determine λ max of a given solution?
   a) Colorimeter
   b) ELISA plate reader
   c) UV-Visible spectrophotometer
   d) pH-meter

2) pH stands for _____.
   a) Probability of H+ ions b) Prediction of H+ ions
   c) Potential of H+ ions d) Preference of H+ ions

3) 1Mole of any solution contains _____.
   a) 1mg in 100 ml distilled water
   b) 1grms in 1000 ml distilled water
   c) Grams molecular weight in 1000 ml of distilled water
   d) Grams normal weight in 1000 ml distilled water

4) A solution of conjugate acid and its base is _____.
   a) Electrolyte b) Buffer
   c) 1N solution d) 1M solution

5) NMR stands for _____.
   a) Non-magnetic resonance
   b) Non-molecular resonance
   c) Nuclear Magnetic Resonance
   d) All a, b, and c

B) Fill in the blanks. (2 marks each) **06**

1) A solution that resists change in pH called _____.
2) Chromatography means Chromas ____and Graphy _____.
3) Live bacteria can be visualized under _____ microscopy.

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

a) Write a short note on numerical aperture.
b) Explain the design of pH meter.
c) What is the protein ladder?
d) Short note on electron gun.

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

a) Describe in detail of transmission and scanning electron microscope.
b) Give a detailed account of ion exchange chromatography.

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

a) What is ORD/CD. Give its principal, working for biological sample analysis.
b) Describe in detail Polyacrylamide gel electrophoresis and comment on the difference between Native and SDS PAGE?

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

a) Describe the method of the western blotting technique.
b) Explain the working construction and principle of the Atomic Absorption Spectrometer.

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

a) Give details of general microscopy with respect to working construction and principles.
b) Enlist types of a light microscopes. Give their applications?

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

a) Explain in detail the Handerson-Hasselbalch equation.
b) Describe in detail about working, construction, and principal of High performance liquid chromatography.

SLR-EZ-6

Seat No.		Set	P

M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Molecular biology and Genetic Engineering (MSC01201)

Day & Date: Monday, 18-12-2023 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 technique is used to detect specific RNA sequence?
   a) Eastern Blotting b) Western Blotting
   c) Southern Blotting d) Northern Blotting

2) Which cells are used to isolate DNA for Human genome project?
   a) Heart cells b) Blood cells
   c) Epithelial cells d) Lung cells

3) Which technique is used to detect COVID-19?
   a) RT-PCR b) RAPD
   c) AFLP d) RFLP

4) How proteins move from Endoplasmic reticulum to Golgi complex?
   a) By globules b) By vacuoles
   c) By lysosomes d) By transport vesicles

5) In which network, metabolite of each node contributes to final product?
   a) Branched b) Non-Branched
   c) Dependent d) Independent

6) Which type of ends are generated by the treatment of restriction endonuclease EcoRI?
   a) Random ends b) Sharp ends
   c) Blunt ends d) Cohesive ends

7) Which enzyme is used for cohesive end ligation?
   a) Calf Alkaline phosphatase
   b) E. coli DNA ligase
   c) T4 Polynucleotide kinase
   d) T4 DNA ligase

8) What is denoted by 'UC' in plasmid pUC18?
   a) University of California
   b) University of Chicago
   c) University of Canada
   d) University of Colorado

9) Which vectors are used to clone larger fragments genomic library?
   a) M13 vector b) Insertion vector
   c) Plasmid vector d) BAC vector

10) Which substrate is used for blue white screening of recombinants?
   a) Glucose b) Lactose
   c) X-gal d) Galactose

B) Write true/false **06**

1) Calcium chloride is used for chemical transformation of DNA into host cells.
2) Sodium nitrate is used for protoplast fusion.
3) Plasmid vectors can be used for transfection of human cells.
4) Gene gun is used to deliver DNA into bacterial cells.
5) White colonies are recombinant in Blue-White screening.
6) Lac Y gene of plasmid is used for blue-white screening.

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

a) Write a short note on RFLP.
b) Write a short note on Western blotting technique.
c) Write a short note on *E.coli* DNA ligase.
d) Write a short note on Micro satellite repeats.

Q.3 Answer the following.

a) Explain in brief about PCR. **10**
b) Write a note on DNA finger printing for forensic. **06**

Q.4 Answer the following.

a) Write in detail about regulation of cell cycle and cell apoptosis. **10**
b) Write a note on benign and malignant tumour. **06**

Q.5 Answer the following.

a) Write in brief about metabolic engineering in practice. **10**
b) Write a short note on synthesis of low molecular weight compounds by Metabolic pathway analysis. **06**

Q.6 Answer the following.

a) Write in brief about Insertion vectors, replacement vectors. **10**
b) Write a note on M13 phage vector. **06**

Q.7 Answer the following.

a) Write in brief about cDNA libraries. **10**
b) Applications of Genetic engineering in Agriculture. **06**

SLR-EZ-7

Seat No.	

Set P

M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov2023
MICROBIOLOGY (CAMPUS)
Immunology and Immuno Technology (MSC01202)

Day & Date: Tuesday, 19-12-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 PM

Instructions: 1) Q. 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 Choose correct alternative. **16**

1) Which of the following term is correct for a Adaptive immunity?
   a) Long lasting and effective protection
   b) First line of defense against infection
   c) Temporary antibodies are produced
   d) It generate quick repose and temporary

2) If allergic reaction generates antibody-mediated reaction IgG or IgM antibodies such type hypersensitivity is _____.
   a) Type IV b) Type III
   c) Type II d) Type I

3) T cell is mature inside the thymus. Cytotoxic T cells are express specific marker. Choose appropriate option for cytotoxic T cell?
   a) CD8 marker and are class I MHC restricted
   b) CD4 marker and are class I MHC restricted
   c) CD4 marker and are class II MHC restricted
   d) CD8 marker and are class II MHC restricted

4) Class I MHC genes encode glycoproteins expressed on the surface of nearly all _____.
   a) Lymphocytes b) Nucleated cells
   c) Non- Nucleated cells d) Tissue cells

5) Hybridoma technology is used in production of monoclonal antibodies. It is possible only when two cells are fuse. Which of the following cells are responsible for formation monoclonal antibodies?
   a) T cells and B cell fusion b) B cell and myeloma cells
   c) T cell and myeloma cells d) Myeloma and T cells

6) In lab small amount of sample can be detected. Which technique is preferred to detect small amount of sample?
   a) Radio Immuno Assay (RIA)
   b) ELISA
   c) Immunofluorescence technique
   d) FACS

7) Degradation of pathogen is carried with help of complement pathway. Direct activation of C3b without antigen-antibody interaction association with factor D,B. Which of the following pathway is directly activating C3b?
   a) The alternative pathway b) Classical pathway
   c) The lectin pathway d) All of the above

8) T-cells are produced from _____.
   a) Bone marrow
   b) Spleen
   c) Thymus
   d) None of these

9) Monoclonal antibodies are used for diagnosis and treatment against pathogens. Production of monoclonal antibodies require hybrid cell. Which organ would you prefer for production of monoclonal antibodies in mice?
   a) Liver
   b) Kidney
   c) Spleen
   d) Liver cell line

10) If antigen is loading along with tapasin takes place inside the RER. Suppose mutation was observed in TAP protein. Choose appropriate option due to mutation in TAP?
   a) Loading of peptide is possible along with MHC II
   b) Loading of peptide is possible along with MHC I
   c) Loading of peptide is not possible along with MHC I
   d) Loading of peptide is not possible along with MHC II

11) Utilisation of enzyme for detection of antigen antibody reaction. ELISA is carried out. Which enzyme will you refer for the ELISA. Choose appropriate enzyme?
   a) Catalase
   b) Neuraminidase
   c) Horse radish peroxidase
   d) Monooxygenase

12) Which of the following technique is Very effective, less time consuming and at a time so many samples can be detected by _____.
   a) Agglutination
   b) CFT
   c) Neutralization
   d) ELISA

13) Which of the following compounds is NOT found in tears?
   a) Lysozyme
   b) Lactoferin
   c) IgA
   d) IgE

14) Muscle cells take up the DNA and the encoded protein antigen is expressed. Use of DNA vaccines are raises in case of Covid19. Which type of immune response is generated by DNA vaccine?
   a) Cell mediated
   b) B cell mediated
   c) Both humoral and cell mediated
   d) None of the above

15) If macrophages are involved in oxygen dependent mechanism. Mainly nitric oxide synthetase involved in degradation of bacteria. What is the role of NOS (nitric oxide synthetase)?
   a) Oxidizes L-Arginine to yield L-Citrulline
   b) Oxidizes L-Citrulline to yield L-Arginine
   c) Oxidizes both L-Citrulline and L-Arginine
   d) None of the above

16) An autoimmune disease is arising in our body due to _____.
   a) Generation of Cytokines
   b) Destruction of RBCs
   c) Metabolism of Lymphocytes
   d) Formation of self antibodies

Q.2 Answer the following **16**

a) Explain in shorts role of primary lymphoid organs involved in development of immune system.
b) Write a note on production of Monoclonal antibodies.
c) Write a note on Rheumatoid arthritis (RA).
d) Write a note on type I hypersensitivity reaction.

Q.3 Answer the following.

a) Explain in brief about Principle method and procedure of Flow cytometer. **10**
b) Write a note on B cell. **06**

Q.4 Answer the following.

a) Write a note on Apoptosis of cell via NK cell. **10**
b) Write a short note on characteristics of Macrophages. **06**

Q.5 Answer the following.

a) Define the term vaccine and explain its classifications of common vaccine. **10**
b) Write a short note endogenous pathway. **06**

Q.6 Answer the following.

a) Write a note on Thyroid associated autoimmune disease. **10**
b) Write a note on Mannose binding lectin pathway. **06**

Q.7 Answer the following.

a) Explain in detail mechanism of Antigen-Presenting Cells in MHC class I molecule. **10**
b) Write a note on Humoral Immune Responses. **06**

SLR-EZ-8

Seat No.		Set	P

M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Medical Microbiology - I (bacteriology and parasitology) (MSC01206)

Day & Date: Wednesday, 20-12-2023 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. **16**

1) What are the distinguishing characteristics between yeast and molds?
   a) Yeast and molds both are multicellular organisms
   b) Molds reproduce both asexually and sexually and yeast reproduces asexually
   c) Molds have fuzzy growth colonies and yeasts always grow as smooth colonies
   d) Both b and c

2) Which is the most common laboratory culture media for fungal growth?
   a) Sabouraud dextrose agar b) Blood infusion agar
   c) Thayer Martin medium d) Cornmeal agar

3) Which one of the following virulence factors may be associated with the pathogenesis of infection caused by *Helicobacter pylori?*
   a) Flagella b) Lipopolysaccharides
   c) Exotoxins d) Endotoxins

4) *Vibrio vulnificus* and *V. parahaemolyticus* both gram-negative, motile bacteria are mostly found in warm coastal areas. What is the common source of transmission of infection in humans by these bacteria?
   a) Water b) Oysters
   c) Shellfish d) All of the above

5) A bacteriological stain also known as the differential stain is used to identify acid-fast organisms. What is the official name of the stain?
   a) Negative stain b) Gram stain
   c) Ziehl-Neelsen stain d) Schaeffer stain- Fulton stain

6) The Filarial larvae can be collected from the sample of _____.
   a) Liver for Biopsy b) Smears of intestinal contents
   c) Smears of spleen d) Peripheral blood at midnight

7) MacConkey's agar is both Selective and Differential media that is used primarily for the isolation of gram-negative bacteria. It consists of _____ which inhibits the growth of gram positive bacteria.
   a) Blood b) Peptone
   c) Bile salts d) Tryptophan

8) Which of the following is the drug of choice for *Ureaplasmaurealyticum* infections?
   a) Penicillin b) Tetracycline
   c) Cephalosporin d) Imipenem

9) Which of the following microbe grows well and shows hemolytic properties in the blood agar?
   a) *Bacillus anthracis* b) *Proteus vulgaris*
   c) *Streptococcus pyogenes* d) *Staphylococcus epidermidis*

10) Which of the following is the routine diagnostic method for the microbial examination of blood specimen collected from a patient who had symptoms such as fever and weakness for more than 2 days?
   a) Direct microscopic examination
   b) Serodiagnosis
   c) Antibiotic susceptibility test
   d) All of the above

11) What is the mechanism responsible for antibiotic resistance in *Mycobacterium tuberculosis?*
   a) Mutations in DNA gyrase gene
   b) Alterations in beta-lactamase
   c) Mutations in the catalase-peroxidase gene
   d) Alterations in RNA polymerase

12) A blood sample from a 19-year-old sexually active woman with genital infections was taken and cultured for the isolation of the responsible pathogen. Name the least likely pathogen that can be responsible for the infection.
   a) *Chlamydia trachomatis* b) *Mycoplasma pneumoniae*
   c) *Mycoplasma hominis* d) *Mycoplasma genitalium*

13) What method/s is/ are important laboratory approach for the diagnosis of genital *Chlamydia* species infections?
   a) Serological tests
   b) Direct fluorescent antibody and Enzyme-linked immunoassay
   c) Nucleic acid amplification test
   d) All of the above

14) Yellow fever and dengue fever virus belong to which family group of the viruses?
   a) Picorna-viruses b) Retro-viruses
   c) Flavi-viruses d) Paramyxo-viruses

15) Which of the following is the common human infection caused by *Mycoplasma spp?*
   a) Pneumonia b) Food poisoning
   c) Shock syndrome d) Skin infections

16) The malaria drug hydroxychloroquine was falsely reported to be effective in which type of viral infection in 2020?
   a) Dengue b) Influenza
   c) Covid-19 d) Swine flu

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

a) Write a note on life cycle of *Toxoplasma gondii.*
b) Write appropriate mechanism of Gram staining.
c) Write a note on life cycle of *Ancylostomata duodenale.*
d) Explain Lab diagnosis of diphtheria.

Q.3 Answer the following.

a) Explain in brief about etiological agent, symptoms, lab diagnosis of bacterial meningitis. **10**

b) Write a note on skin disease cause by staphylococcal bacteria **06**

Q.4 Answer the following.

a) Explain in brief about identification of bacteria by using following methods like gram staining, different types of media, biochemical test and serological tests. **10**

b) Write a short note on mechanism and application of Fluorescent microscopy. **06**

Q.5 Answer the following.

a) Explain in detail about Morphology, symptoms, life cycle, lab diagnosis and treatment of pepticulcer by *helicobacter.* **10**

b) Write a short on life cycle, lab diagnosis of *Ecchinococcus granulosus.* **06**

Q.6 Answer the following.

a) Write in brief about disease caused by *S aureus.* **10**

b) Write a short note on symptoms and life cycle of Malaria. **06**

Q.7 Answer the following.

a) Write in brief about *W. Bancrofti* with respect transmission, laboratory diagnosis, prophylaxsis and treatment. **10**

b) Write a short note on mode of transmission, lab diagnosis, symptoms, of *Giardia lamblia.* **06**

SLR-EZ-10

Seat No.		Set	P

M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Pharmaceutical Microbiology (MSC01301)

Day & Date: Friday, 05-01-2024 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) Who is responsible for upstream process like prepare media, loading media in fermenter, inoculum preparation, addition of inoculum in media?
   a) Research and Development Microbiologist
   b) Quality assurance executive Microbiologist
   c) Quality control executive Microbiologist
   d) Production Microbiologist

2) How will you confirm Nutrient agar is completely sterilized in autoclave by using biological indicator?
   a) By using *Bacillus subtilis* spores
   b) By using *Bacillus steriothermophilus* spores
   c) By using *Bacillus steriothermophilus* cells
   d) By using *Thermus aquaticus* spores

3) Which medium is used detect of *Pseudomonas* contamination in pharma product?
   a) Mannitol salt agar
   b) MacConkey agar
   c) Xylose lysine deoxycholate agar
   d) Cetrimide agar

4) What is included in Grade A cleanroom clothing of a working person?
   a) General gloves b) Head gear hood
   c) General head cover d) General sleepers

5) How bacteria confer resistance to penicillin?
   a) By utilizing penicillin as a carbon source
   b) By producing Penicillinase enzyme
   c) By producing Beta lactamase enzyme
   d) By changing structure of Penicillin

6) Which test is used to detect pyrogen in pharmaceuticle product?
   a) Pyrogen detection test
   b) Limulus amebocyte lysate test
   c) Endotoxin detection test
   d) Lipopolysaccharide detection test

7) Which criteria is most important in relation with staff in microbiology laboratory management?
   a) Personal behavior b) Knowledge
   c) Training d) Personality

8) What is the qualification frequency of Grade A cleanroom facility in pharma industry?
   a) 6 Monthly b) 4 Monthly
   c) 2 Monthly d) Monthly

9) Which criteria includes sterilization record, time and date of manufactured pharma product?
   a) Research and development
   b) Batch manufacturing record (BMR)
   c) Acceptable quality levels (AQLs)
   d) Quality control

10) Which department is related to the collection, detection, assessment, monitoring, and prevention of adverse effects with pharmaceutical products?
   a) Pharmacokinetics b) Pharmacodynamics
   c) Pharmacopoeia d) Pharmacovigilance

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

1) Dosimeter is used to measure radiation doses in sterilization process.
2) Ketoconazole is an example of antibiotic used to treat bacterial infections.
3) Penicillin inhibits the DNA replication of bacteria
4) Total yeast and mold count (TYMC) is the term used to count fungi in bioburden determination.
5) BGLB broth is used in Confirmed test of MPN.
6) X-ray radiation are used to sterilize most of the pharma products.

Q.2 Answer the following **16**

a) Write a short note mechanism of action of Amphotericin B.
b) Write a short note on injection and total parenteral nutrition.
c) Write a short note on radiation sterilization.
d) Write a short note on physical indicator of sterilization.

Q.3 Answer the following

a) Role of the microbiologist in pharmaceutical industries. **10**
b) Write a note on mechanism of action of ketoconazole and Nystatin. **06**

Q.4 Answer the following

a) Write in brief about Microbiological assessment of pharmaceutical water Systems. **10**
b) Write a short note on Chromogenic assay, ELISA test and MAT test for detection of pyrogen and endotoxin in pharmaceutical product. **06**

Q.5 Answer the following.

a) Write in brief about in microbiological aseptic techniques, cleanroom discipline and clothing. **10**
b) Write a short note on following physical parameters of cleanroom testing - Air flow, Air change, Positive Pressure, temperature humidity and Light. **06**

Q.6 Answer the following.

a) Write in brief about Quality Audit of microbiology laboratory in pharmaceutical industries. **10**

b) Write a short note on validation and qualification in pharmaceutical industries. **06**

Q.7 Answer the following.

a) Write in brief about Clinical trials of antimicrobial drugs. **10**

b) Write a short note on three vaccine manufacturing processes. **06**

SLR-EZ-11

Seat No.		Set	P

M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Biostatistics and Bioinformatics (MSC01302)

Day & Date: Sunday, 07-01-2024 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. (MCQ) (2×5) **10**

1) The average value of a given data is _____.
   a) standard deviation b) ANOVA
   c) Mean d) Mode

2) For accepting the data which of the following is/are necessary _____.
   a) It should be reproducible.
   b) Having minimum ambiguity.
   c) Based on certain experiments/study.
   d) All of the above

3) Categorical data problems can be solved by _____.
   a) ANOVA b) Chi-square test
   c) Standard deviation d) All of the above

4) Collection of data abruptly is _____.
   a) continuous sampling b) random sampling
   c) census of India d) All of the above

5) Branch of mathematics which deals with biological data is _____.
   a) Bio statistics b) Mathematics
   c) Applied statistics d) None of above

B) Fill in the blanks. (2×3) **06**

1) EBI is European_____ institute.
2) β –sheets and β- loops of protein represents _____ structure.
3) The average value from given data represents _____.

Q.2 Write short notes **16**

a) Swiss-Prot database
b) Gene Bank
c) Standard deviation
d) Karl Pearson coefficient

Q.3 a) Describe in detail protein information with reference to ExPASy. **08**
b) Give a detailed account of the primary nucleotide databases. **08**

Q.4	**a)**	What is PDB? Put focus over its significance.	**08**
	b)	Explain how protein structure can be determined by using structural databases.	**08**
Q.5	**a)**	Enlist and explain tools used for visualization protein structure.	**08**
	b)	What is molecular docking? Highlight its significance.	**08**
Q.6	**a)**	Define the following terms: 1) Statistics 2) Biostatistics 3) Mean 4) Mode 5) Standard deviation	**10**
	b)	Enlist different graphical methods for the representation of data.	**06**
Q.7	**a)**	Differentiate between the Binomial and Poisons distribution.	**08**
	b)	Solve the problem. In a cross between black and white coat color mice, individuals obtained in F2 generation are 787 black and 277 white coat color individuals. The expected ratio is 3:1, apply the chi-square test and comment weather data is accepted or not (P = 5%).	**08**

SLR-EZ-12

Set No.		Set	P

M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Medical Microbiology - II (MSC01306) (Viral and Fungal Diseases)

Day & Date: Tuesday, 09-01-2024 Max. Marks: 80
Time: 11:00 AM To 2:00 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) If person was suffering from viral infection and the symptoms are like CMV infection. This test was confirmed result within 4 week. Which of the following test is good for CMV that provides result within 24 hrs?
   a) Early antigen fluorescent foci test
   b) Late antigen fluorescent foci test
   c) ELISA test
   d) RIA test

2) Ganciclovir drug acts on nucleic acid biosynthesis due to its analog structure of guanine. Which of the following virus can be inhibited to this drug?
   a) Corona virus b) Cytomegalovirus
   c) Hepatitis virus d) Omicron virus

3) According medical microbiology fungal infection observed under microscope show different morphology. In fungal infection suppose that show Pleuromorphic character. Which of the following fungal infection show pleuromorphic character?
   a) Candidiasis b) Blastomycosis
   c) Mucormycosis d) Ascomycosis

4) In corona pandemic situation they detectable corona virus size approximately 80 to 120 nm. Which of the following size mask act as protection against corona virus?
   a) Double surgical mask b) N95 mask
   c) Cotton mask d) Cotton mask coating titanium

5) Adenovirus is mainly preferred for preparation for vaccination. Which of the following reason is true for selection of adenovirus for vaccine preparation?
   a) Adenovirus is DNA virus so they are stable for preparation of vaccine
   b) Adenovirus is RNA virus so they are used to prepare vaccine
   c) Adenovirus is having large size so easy to prepare vaccine
   d) Adenovirus is having small size so easy to handle for preparation of vaccine

6) If person suffering to alpha type of Chikungunya virus that can leads to joint pain is one of the symptoms. Which of the following true if we perform serological test?
   a) RBCs count decrease
   b) Increase platelet number
   c) Decrees of platelet number
   d) Creatin protein increase

7) It is more useful are rapid culture methods for identification of cytomegalovirus is _____ can provide a result in 24-48 hours.
   a) DEAFF test b) Kit Test
   c) ELISA d) PCR

8) Japanese encephalitis Virus infectivity rate is more in rice field farmer. What is the cause behind rice farmer get infected choose correct option?
   a) Aedes mosquito is major role played in virus transmission
   b) Culex tritaeniorhynchus a rice field breeding mosquito is the major vector
   c) Water is measure cause to transmission of virus
   d) Mud containing clue are mainly responsible to transmit virus

9) If you have to cultivate virus in laboratory and you prefer egg inoculation technique in that air sac play important role. Which of the following will be true about air sac?
   a) Air sac act as main area to inoculate virus
   b) Air sac provide toxic exchange between cells
   c) Air sac is Provide oxygen and release carbon dioxide in air
   d) Air sac maintains the fluidity in egg.

10) Some of the viruses are responsible for formation of cancer in human beings. Which of following virus is responsible for cause skin cancer in human?
   a) Retro virus b) Kaposi's Sarcoma
   c) Adenovirus d) CMV

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

1) If you are vaccinated with corona body will be responds it and produces 1st IgG antibodies.
   a) True b) False

2) If virus sample detection confirmed test used by instrument PCR. Rt-PCR you should refer if virus contains RNA as genetic material.
   a) True b) False

3) In case of patients suffering from fungal infection. Drug design for targeted to fungus should be on ribosome.
   a) True b) False

4) Aedes mosquitoes are also responsible to spread some disease mainly they are act as carrier for some viruses. Ebola virus is transmitted from mosquito’s bites.
   a) True b) False

5) Brain, Spleen and Kidney these three organs can damage due to infection of virus. Mucormycosis is responsible to transmission of Corona virus.
   a) True b) False

6) Polio virus can cause infection to gray matter and finally leads to paralysis in patient.
a) True b) False

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

a) What is Japanese encephalitis? Explain its symptoms and treatment of JPV.
b) Write a note on pathogenicity and diagnosis of zika virus.
c) Write a note on Remdesivir.
d) Explain in short mode of action of HIV and its treatment.

Q.3 Answer the following.

a) Write in detail on structure, genomic organization, pathogenesis and control of Kaposi's sarcoma virus. **10**
b) Write a note on mode of transfer and explain its diagnosis and treatment of rotavirus. **06**

Q.4 Answer the following.

a) Explain in brief antiviral drugs that are approved or under evaluation for the treatment of COVID-19. **10**
b) Write a note on pathogenesis and pathology of Nipah virus and its treatment. **06**

Q.5 Answer the following.

a) Write in detail on structure, genomic organization, pathogenesis and control of Chikungunya virus. **10**
b) Write a note on Mode of action of Herpes virus. **06**

Q.6 Answer the following.

a) Explain in detail how does vaccine therapy works in COVID-19and its types. **10**
b) Write a note on antibody therapy works in COVID-19. **06**

Q.7 Answer the following.

a) Explain in detail pathogenesis, mode of transmission and treatment of mucormycosis. **10**
b) Write a short note on mode of action of zika virus. **06**

SLR-EZ-14

Seat No.		Set	P

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Research Methodology (MSC01401)

Day & Date: Monday, 18-12-2023 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 correct alternative. **10**

1) What is the objective of research?
   a) To test theory b) To test a hypothesis
   c) To test law d) To test concept

2) Which research aims at finding a solution?
   a) Analytical research b) Descriptive research
   c) Fundamental research d) Applied research

3) To which person research may mean the outlet for new ideas and insights?
   a) To Philosopher and thinkers
   b) To Professional
   c) To literary men and women
   d) To analysts and intellectuals

4) Which is included in research methodology?
   a) Survey for research
   b) Techniques used to conduct research
   c) General methods used to conduct research in all fields
   d) Data collection for research

5) Which study gives the student the necessary training in gathering material and participation in the field work for research?
   a) Research methodology b) Research training
   c) Research methods d) Research thinking

6) Which is the last step of research process?
   a) Formulating the research problem
   b) Development of working hypotheses
   c) Preparation of the report or the thesis
   d) Extensive literature survey

7) Which is the part of research design?
   a) Environmentally controlled variables
   b) Dependent and independent variables
   c) Variables
   d) Uncontrolled variables

8) Which is a part of research reference include PICO?
   a) Search engine
   b) Retracted publications
   c) Formulating a search query
   d) Search database

9) Which is a measure usefulness of a particular journal for a given year?
   a) Citation index b) Impact factor
   c) H-index d) i10-Index

10) Which database is developed by NCBI for biomedical research?
   a) BIOSIS b) EMBASE
   c) Medline d) PubMed

B) Write true/false **06**

1) Preparation of the final bibliography is a first step of research report writing.
2) Results are the part of main text of the research layout.
3) Materials and methods are a part of main text of the research layout.
4) Plagiarism is not a scientific misconduct.
5) SALAMI is not a scientific misconduct.
6) Journal refuse to publish articles from author who found in scientific misconducts.

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

a) Write a short note on meaning and objective of research.
b) Write a short note on Qualitative vs. Quantitative research and Conceptual Vs. Empirical research.
c) Write a short note on design decisions and parts of the research design.
d) Write a short note on PICO approach for formulating query.

Q.3 Answer the following.

a) Explain in brief about first 5 steps of research process **10**
b) Write a note on criteria of good research. **06**

Q.4 Answer the following.

a) Write in brief about important concepts relating to research design. **10**
b) Write a note on basic principles of experimental designs. **06**

Q.5 Answer the following.

a) Write in brief about different types of principal bibliographic databases. **10**
b) Write a note on personal reference databases. **06**

Q.6 Answer the following.

a) Write in brief about layout of the research report. **10**
b) Write a note on popular research report and oral presentation. **06**

Q.7 Answer the following.

a) Write in brief about why scientific misconduct occurs and SALAMI, IMALAS and duplicate publication. **10**
b) Write a note investigation and punishment of scientific misconduct. **06**

SLR-EZ-15

Seat No.	

Set P

M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (Campus)
Biosafety and Lab Management (MSC01402)

Day & Date: Tuesday,19-12-2023 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 from given option. **10**

1) Below is the list of laboratory rules except
   a) Wear lab coat, glove and cover shoes every time entering into lab
   b) Never do any experiment without instruction by laboratory instructor/technician
   c) Eating, drinking and smoking are prohibited inside the laboratory
   d) Student can made noise during discussion inside the laboratory

2) Which class of biosafety cabinet is the most common and used for working with biological materials or organisms?
   a) Class I b) Class II
   c) Class III d) Class IV

3) PPE is _____.
   a) Personal protective equipment
   b) Public protective equipment
   c) Possible protective equipment
   d) All of the above

4) When identifying risk and addressing hazards, the goal is to provide the highest _____ and the lowest practical _____.
   a) resistance/virulence b) attenuation/pathogenicity
   c) protection/exposure d) prevention/virulence

5) What is the hazard that you may found in the lab?
   a) Chemicals
   b) Infectious bacteria
   c) Physical hazard such as falling from the wet floor
   d) All the listed above

6) How should biological materials that need to be transported from the lab to another location be handled?
   a) Wear a lab coat and transport materials in your pocket
   b) Wear gloves and carry the material in your hands
   c) Seal materials in a leak-proof, shatter-resistant secondary container
   d) Cells in cell culture flasks and dishes are fine for transport

7) Which of the following is considered a biohazard?
   a) Blood b) Urine
   c) Stool d) All body fluid

8) Various measures taken to prevent any risks to normal organisms from transgenic organisms are known as _____.
   a) Biosafety b) Patent
   c) Bio-patent d) Bio-piracy

9) Which of the following type(s) of Personal Protective Equipment (PPE) is frequently used?
   a) Safety glasses b) Lab Coats
   c) Gloves d) All of the above

10) Type of packing mandatory for transportation of COVID -19 is?
   a) Single layer b) Triple layer
   c) Double layer d) None of above

B) Write true/false **06**

1) A Biohazard sign must be completed and posted on lab doors in order to meet Biosafety Level 2 containment requirements.
   a) True b) False

2) Every lab is required to have both a First Aid kit and a spill kit.
   a) True b) False

3) Pipet tips and microcentrifuge tubes can be stored in the biological safety cabinet.
   a) True b) False

4) Infectious agent, biological materials and consumable items must be disinfected chemically or by autoclave before final disposal in biohazard waste bin.
   a) True b) False

5) Bleach should always be used to sterilize lab instruments after cleaning
   a) True b) False

6) *Cryptococcus neoformans* would be handled in Risk Group 4.
   a) True b) False

Q.2 Answer the following **16**

a) Explain general rules regarding chemical incompatibilities
b) Explain in short biosafety Level 3 and 4.
c) Write anote on specimen Transfer within laboratory
d) Write a note on Review risks and risk control measures of risk assessment.

Q.3 Answer the following.

a) Write a note on Decontamination and waste management. **10**
b) Write a note on WHO laboratory biosafety guideline related to COVID-19 **06**

Q.4 Answer the following.

a) Explain in brief about Assigned roles and responsibilities in biosafety program managements. **10**
b) Write a note on Electrical hazards **06**

Q.5 Answer the following.

a) Write a note on off-site transport of infectious substances **10**
b) Write a note on Protection activities of ionizing radiation related to time, distance and shielding **06**

Q.6 Answer the following.

a) Write a note on biosecurity risk assessment **10**

b) How Laboratory coats, Respiratory protection, Eye protection of PPE are involved in reducing risks in Heightened control **06**

Q.7 Answer the following.

a) Write a note on Good microbiological practice and procedure **10**

b) Write a note on general rules of chemical incompatibilities regarding to Toxic effects of chemicals, Explosive chemicals and chemical spills **06**

SLR-EZ-16

Seat No.		Set	P

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Microbial Diversity and Taxonomy (2316101)

Day & Date: Friday, 05-01-2024 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

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

Q.1 A) Rewrite the sentences by selecting correct alternatives given below. 08

1) Symbiotic association between algae and fungi is _____.
   a) Mycorrhiza b) Mycobaterium
   c) Mycoplasma d) Lichen

2) _____ gene derive the evolutionary relationship between taxonomic group
   a) 23SrRNA b) 16SrRNA
   c) 5SrRNA d) 18SrRNA

3) _____ found in extreme saline conditions.
   a) Psychrophiles b) Mesophiles
   c) Neutrophils d) halophiles

4) Archaebacteria and nitrogen fixing bacteria are classified in _____ kingdom.
   a) Animalia b) Plantae
   c) Monera d) Fungi

5) Binomial nomenclature was given by _____.
   a) Linnaeus b) Hugo
   c) Johnson d) Huxely

6) % similarly (%S) of each strain to every other strain is calculated by_____.
   a) Intuitive method b) Numerical taxonomy
   c) Genetic relatedness d) DNA homology

7) Mitochondria and chloroplasts have their own DNA which is similar to the DNA of _____.
   a) Protozoa b) Human
   c) Bacteria d) Fungi

8) The period of years between _____ and _____ is referred to as the golden age of Microbiology.
   a) 1300 and 1400 b) 1570 and 1680
   c) 1230 and 1370 d) 1857 and 1913

B) Write True or False. 04

1) yeasts are Fungi.
2) Mycorrhiza is association between fungi and Proteus.
3) Methanogens do not produce oxygen.
4) Praramecium, penicillin and plasmodium belongs to the same kingdom.

Q.2 Answer the following (Any six) **12**

a) Mycorrhiza
b) Psychrophiles
c) Hyperthermophiles
d) Termoenzymes
e) Genus
f) Endosymbiotic theory
g) Hydrosphere

Q.3 Answer the following (Any three) **12**

a) Characteristics of protozoa
b) High pressure habits
c) Hierarchical organization
d) Thermophilic Archaebacteria

Q.4 Answer the following (Any two) **12**

a) Whittaker's five kingdom classification
b) Morphological characteristics used in taxonomy
c) General characteristics and classification fungi

Q.5 Answer the following (Any two) **12**

a) Haeckel's three kingdom classification
b) Biochemical characteristics used in taxonomy
c) Theoretical aspects of evolutionary analysis

SLR-EZ-17

Seat No.		Set	P

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Recent Trends in Virology (2316102)

Day & Date: Sunday, 07-01-2024 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

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

Q.1 A) Rewrite the following sentences by selecting correct answer from given alternatives. **08**

1) Bacteriophages are counted by ____ assay.
   a) Colorimetric b) Plaque
   c) Enzymatic d) Chemical

2) _____ is helical virus.
   a) TMV b) T_4
   c) Poxvirus d) Herpes

3) _____ is antiviral protein produced after viral infection.
   a) Histamine b) Heparin
   c) Insulin d) Interferon

4) Viral genome are packaged in capsid made up of _____.
   a) Lipids b) Carbohydrates
   c) Proteins d) Calcium

5) Viruses which causes lysis of bacteria are known as _____ viruses.
   a) Lytic b) Lysogenic
   c) Lysozymic d) Latent

6) Viruses outside their host cells survives as _____.
   a) Viri spore b) Virions
   c) Exospore d) Endospore

7) Viral genome inserted in the bacterial DNA is termed as _____.
   a) Plasmid b) Capsid
   c) Prophage d) Prion

8) Chikungunya is caused by _____.
   a) Mosquito b) Rats
   c) Mites d) Aedes aegypti

B) Write True or False **04**

1) Bacteriophages infects liver cells.
2) The family of Rhabdoviridae possesses ds DNA.
3) Tamiflu is used to cure Influenza.
4) TMV is plant virus.

Q.2 Answer the following (any Six) **12**

a) What are the temperate phages?
b) Who described one step growth curve?
c) Define prions.
d) What is Brust size?
e) Give two examples of antiviral drugs.
f) What is oncogene?
g) Define Lysogeny.
h) Who discovered virus?

Q.3 Answer the following. (any Three) **12**

a) Give the general characteristics of viruses.
b) Write note on Infectivity assays.
c) Write note on SARS
d) Write in brief cultivation viruses in Embryonated egg.

Q.4 Answer the following. (any Two) **12**

a) Describe in detail Lytic cycle.
b) Describe in detail classification and nomenclature of Animal viruses.
c) Describe in detail corona virus.

Q.5 Answer the following. (any Two) **12**

a) Describe in brief control of viral infections.
b) Describe in detail pathogenesis of plant viruses.
c) Describe in brief various methods used for purification of viruses.

SLR-EZ-18

Seat No.	

Set P

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Diagnostic Microbiology (2316107)

Day & Date: Tuesday, 09-01-2024 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

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

Q.1 A) Rewrite the sentences choosing correct alternative. **08**

1) Rubella virus refers to the _____ infection
   a) German measles b) Chicken pox
   c) Measles d) Small pox

2) Direct fluorescent antibody test is safer method for diagnosis of ____.
   a) Syphilis b) tuberculosis
   c) Rubella d) Leprosy

3) In a BSL 2 laboratory, what type of protective clothing is typically required for laboratory personnel.
   a) lab coat and gloves
   b) Lab coat, gloves and safety goggles
   c) Lab coat, gloves, safety goggles and a face mask.
   d) Lab coat, gloves safety goggles and face shield

4) Koplik spot formation is the specific symptom in _____ disease.
   a) Streptococcus b) Salmonella
   c) Rubella d) Rubeola

5) _____ like components added in the enriched media support the growth of fastidious organisms.
   a) pH indicator b) salt
   c) Bile salt d) Blood

6) Following methods of diagnosis utilize labelled antibody except _____.
   a) ELISA b) Haemagglutination inhibition
   c) Radioimmunoassay d) immunofluorescence

7) In herpes, primary lesion is _____.
   a) ulcer b) Papule
   c) Vesicle d) none of the above

8) What is the ideal temperature range for transporting and storing most clinical specimens before they reach the laboratory?
   a) Body temperature (37°C) b) Freezing (-20°C)
   c) Refrigerated (2-8°C) d) Room temperature (20-25°C)

B) Answer the questions true/false **04**

1) Hands should be washed before and after working in a biological safety cabinet -
   a) True b) False
2) Taq polymerase enzyme is used in PCR technique.
   a) True b) False
3) Full form of RFLP is Restriction Fragment Length Polymorphism.
   a) True b) False
4) In complement fixation test hemolysis indicates positive test.
   a) True b) False

Q.2 Answer the following. (Any Six) **12**

a) Explain BSL 1
b) Structure of Rubella virus
c) Define biohazardous waste
d) Herpes Zooster virus
e) Define CSF and collection of CSF.
f) Define biosafety cabinet
g) What is microbiome?
h) Use of incineration

Q.3 Answer the following. (Any Three) **12**

a) ELISA test
b) Life cycle of *Balantidium coli*
c) Immunofluorescence test
d) RFLP

Q.4 Answer the following. (Any Two) **12**

a) Hemagglutination and Hemagglutination inhibition Test.
b) PCR technique and its application in diagnosis
c) Life cycle of Ascaris lumbricoides

Q.5 Answer the following. (Any Two) **12**

a) Pathogenesis and symptoms of *Helicobacter pylori*
b) Note on Rubeola virus infection
c) Write a note on collection of clinical samples methods of transport of clinical samples.

SLR-EZ-19

Seat No.	

Set P

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Techniques in Microbiology - I (2316108)

Day & Date: Tuesday, 09-01-2024 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All Question are compulsory.
2) Figure to right indicate full marks.

Q.1 A) Rewrite the following sentences by selecting correct answer from given alternatives. **08**

1) Gieger muller counter is used to defect _____.
   a) Charge b) pH
   c) Mass d) Radiation

2) In Laminar air flow _____ filter is used.
   a) HEPA b) Membrane
   c) Seitz d) Whatsman

3) Centrifugation based on _____ law.
   a) Stains b) Stoke's
   c) Newton's d) Ohm's

4) _____ type pH meter is simplest of pH meters.
   a) Null-detector b) Direct reading
   c) Digital d) Modern

5) The resolving power of TEM is derived from _____.
   a) Specimen b) Weight
   c) Electrons d) Ocular system

6) _____ is used locating agent in paper chromatography.
   a) HCl b) Alcohol
   c) Safranin d) Ninhydrin

7) _____ Metal is used with nanoparticles for antibiotic delivery.
   a) Gold b) Silver
   c) Zinc d) Titanium

8) _____ is principle in NMR spectroscopy.
   a) Difraction b) Refraction
   c) Absorption d) Emmision

B) Write True/False **04**

1) E. Ruska developed Electron Microscope.
2) Nanoparticles are not synthesized by microorganisms.
3) The electrodes used in pH measurement have very high internal resistance.
4) Electrophoresis is not used for separation of DNA.

Q.2 Answer the following (Any Six) **12**

a) What is use of Biosafety cabinet?
b) What is Rf value?
c) What is principal of colorimeter?
d) What are applications of Electron Microscope.
e) Define nanoparticles.
f) What is application of fluorescence correlation spectroscopy?
g) What is use of Ur-visible spectrophotometer?

Q.3 Answer the following. (Any Three) **12**

a) Describe in detail pH meter.
b) Describe in detail thin layer chromatography.
c) Describe different types of nanoparticles and their applications.
d) Write on confocal fluorescence microscopy.

Q.4 Answer the following. (Any Two) **12**

a) Describe in brief Atomic absorption spectroscopy.
b) Describe in detail colorimeter.
c) Describe various types of centrifuges.

Q.5 Answer the following. (Any Two) **12**

a) Describe in detail Electron Microscope.
b) Describe in detail Agarose gel electrophoresis.
c) Describe in detail applications of Nanobiotechnology.

SLR-EZ-20

Seat No.	

Set P

M.Sc. (Semester - I) (New) (NEP CBCS) Examination: Oct/Nov-2023
MICROBIOLOGY (CAMPUS)
Research Methodology (2316103)

Day & Date: Thursday, 11-01-2024 Max. Marks: 60
Time: 03:00 PM To 05:30 PM

Instructions: 1) All Questions are compulsory.
2) Figure to right indicate full marks.

Q.1 A) Choose correct alternative. (MCQ) **08**

1) What is a research design?
   a) A plan for data analysis
   b) A method for data collection
   c) A statistical technique
   d) A framework for conducting research

2) Boolean operators used in conducting literature searches include _____.
   a) OR & AND b) only OR
   c) OR, AND, NOT d) only NOT

3) _____ section of research paper has tables & graphical presentation.
   a) Introduction b) Result
   c) Methods d) Discussion

4) _____ is NOT a type of research data.
   a) Primary data b) Secondary data
   c) Tertiary data d) Meta data

5) Questionnaire is a _____.
   a) Research method b) Measurement technique
   c) Tool for data collection d) Data analysis technique

6) Which section of research article describe “Problem statement”?
   a) introduction b) methods
   c) discussion d) results

7) Inductive logic proceeds from: _____
   a) General to General b) Particular to General
   c) General to Particular d) Particular to Particular

8) Which of the following is not a “Graphic representation”?
   a) Pie Chart b) Bar Chart
   c) Table d) Histogram

B) Write True /False. **04**

1) Results are primarily in the past tense.
2) For writing review article, it sufficient to refer to two or three papers.
3) The null hypothesis states that there is no relationship between the two things.
4) A specific source used in your text is called reference.

Q.2 Answer the following. (Any Six) **12**

a) Define research.
b) What is citation?
c) What is data?
d) What is the long form of IMRaD?
e) Which are different ways of scientific communications?
f) What should be written in acknowledgement section of research paper?
g) Write any four characteristics of good research.
h) What is correlational research?

Q.3 Answer the following. (Any Three) **12**

a) Write a note on “Motivation of research”.
b) What is Inductive and deductive reasoning.
c) What are the differences in qualitative and quantitative research?
d) Write a note on “Review article”.

Q.4 Answer the following. (Any Two) **12**

a) Discuss on “Types of data”.
b) Discuss on “Material and Methods” section of research paper.
c) Write in detail about “descriptive research”.

Q.5 Answer the following. (Any Two) **12**

a) Discuss in detail about “hypothesis.
b) Write an essay on “plagiarism”.
c) Write an essay on “research design”.