SLR-TA-1

Seat No.		Set	P

M.Sc. (Semester - I) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY (CAMPUS)
Cytology and Taxonomy of Microorganisms (MSC01101)

Day & Date: Wednesday, 19-07-2023 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 correct alternative. **10**

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

2) The pigments _____ and _____ are responsible for the characteristic red colouration of the algae.
   a) Phycocyanin, Phycoerythrin
   b) Carotenoids, Xanthophyll
   c) Phycocyanin, chlorophyll-a
   d) All of these

3) A _____ is a mutualistic symbiotic association formed between a roots of higher plants and a fungus.
   a) Lichen b) Actinomycetes
   c) Mycorrhiza d) Both a & c

4) In reproduction of fungi the motile sporangiospores are called as _____.
   a) Aplanospores b) Zoospores
   c) Zygospores d) Oospores

5) During assembly of icosahedral viruses, the process may involve proteins that are temporarily present, these proteins are known as _____.
   a) Scaffolding proteins b) Proteases
   c) M protein d) Polyprotein

6) The grouping by numerical methods of taxonomic units into taxa on the basis of their characters is called as _____.
   a) Phylogenetic classification
   b) Phenetic classification
   c) Numerical taxonomy
   d) Natural classification

7) In archaebacterial cell membrane fatty acids are linked to glycerol molecules by _____ linkage
   a) Peptide b) Ether
   c) Phosphodiester d) Ester

8) The simple matching coefficient is calculated by which of the following formulae?
   a) (a+d)/(a+b+c+d) b) (a+b)/(a+b+c+d)
   c) (c+d)/(a+b+c+d) d) a/a+b+c

9) _____ is basic taxonomic rank.
   a) Genus b) Class
   c) Family d) Species

10) In reproduction of fungi _____ are formed as a result of the fusion of two dissimilar appearing gamates.
   a) Zygospores b) Oospores
   c) Basidiospores d) Ascospores

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

1) Cyanobacteria are algae & their cells have nuclei.
2) In bacterial cell cycle the period between division & the initiation of chromosome replication is known as the B period.
3) Lichens growing on surface of soil are called as Terricolous lichen.
4) The lambda repressor protein which is a product of *cl gene* promotes lytic and the Cro protein which is a product of the *cro gene* promotes the lysogenic cycle.
5) The algae which are found in hot springs are called as halophytic algae.
6) Activator protein is a protein that bind to promoter site and enhance the binding of RNA polymerase and increase the rate of transcription of genes.

Q.2 Answer the following

a) Write a note on economic importance of lichen. **04**
b) Write a note asexual reproduction of fungi by budding. **04**
c) Describe in detail heterocyst formation in Cyanobacteria. **04**
d) Write a note on viral classification of viruses by ICTV. **04**

Q.3 Answer the following

a) Describe in detail general characteristics & outline classification of algae. **10**
b) Write an essay on Bacterial flagella. **06**

Q.4 Answer the following

a) When temperate phage will infect host cell how it will follow either lytic & lysogenic cycle & explain in detail about lysogenic cycle. **10**
b) Write a note on occurrence & economic importance of fungi. **06**

Q.5 Answer the following.

a) Write a note on surface properties of bacteria & its significance. **10**
b) Write a note on Bergey's Manual of Determinative Bacteriology & Systematic Bacteriology. **06**

Q.6 Answer the following.

a) Give a detail account of general characteristics & classification of Actinomycetes. **10**
b) Explain in detail classification of lichen based on thallus morphology. **06**

Q.7 Answer the following.

a) Explain in detail about virus genome replication with neat labelled diagram. **10**
b) Write a note on chemotaxonomy. **06**

SLR-TA-2

Seat No.	

Set P

M.Sc. (Semester - I) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY
Microbial Genetics (MSC01102)

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) Eukaryotic DNA contains 'Exons' which are _____ sequences.
   a) Functional b) Non-functional
   c) Mutated d) Repeated

2) In DNA structure, 2-deoxyribosesugar is a _____ sugar.
   a) Hexose b) Pentose
   c) Tetrahalose d) Simple

3) Which mutation caused by UV-radiations?
   a) Guanine dimer b) Adenine tetramer
   c) Cytosine tetramer d) Thymine dimer

4) How the F-plasmid transferred from one bacterial cell to another bacterial cell?
   a) Through flagellum b) Through cell wall
   c) Through conjugation channel d) Through Pilus

5) Which sequences present at both ends of ISI elements of transposons?
   a) Alternate repeats b) Inverted terminal repeats
   c) Central repeat d) Long terminal repeats

6) How will you collect separated DNA layer from density gradient centrifuge tube?
   a) By puncturing the centrifuge tube using syringe
   b) By removing each layer using micropipette
   c) By cutting each layer
   d) By decanting each layer

7) How 'Sphaeroplast' formed during plasmid purification?
   a) By treating bacterial cells with lysozyme to produce fully degraded plasma membrane
   b) By treating bacterial cells with lysozyme to produce fully degraded cell wall
   c) By treating bacterial cells with lysozyme to produce partially degraded cell wall
   d) By treating bacterial cells with lysozyme to produce partially degraded plasma membrane

8) What is added at one end of mRNA during post-transcriptional modification?
   a) Poly-Cytosine tail b) Poly-Guanine tail
   c) Poly-thymine tail d) Poly-adenosine tail

9) Which branch of genomics study uncultured soil bacteria by the isolation of soil DNA?
   a) Structural genomics b) Functional genomics
   c) Metagenomics d) Epigenomics

10) Which phage currently synthesized in vitro by using artificial DNA synthesis?
   a) Lambda phage b) phi X 174 phage
   c) T4 phage d) M13 phage

B) Write True or False **06**

1) Hershey and Chase used T2 bacteria for their experiments.
2) DNA absorbs the wavelength of 360 nm.
3) Separation of two DNA strands is called as renaturation.
4) B form is a natural form of DNA.
5) Conjugation is done by bacteriophages.
6) Calcium chloride is used for competent cell preparation.

Q.2 Answer the following **16**

a) Write a short note on different forms of DNA.
b) Write a short note on types of mutation.
c) Write a short note on insertion sequences.
d) Write a short note on epigenomics and metagenomics.

Q.3 Answer the following

a) Explain in brief about Watson and Crick model DNA structure. **10**
b) Write a note on Griffith's Experiment. **06**

Q.4 Answer the following

a) Write in brief about enzymes involved in DNA replication. **10**
b) Write a short note on Ames test. **06**

Q.5 Answer the following

a) Write in brief about composite transposons and non-composite transposons. **10**
b) Write a short note on nomenclature, classification, general properties of plasmids. **06**

Q.6 Answer the following

a) Write in brief about Lactose operon. **10**
b) Write a short note on post transcriptional modifications. **06**

Q.7 Answer the following

a) Write in brief about structure and life cycle of T4 bacteriophage. **10**
b) Write a short note on Structure and replication of phage Φx174. **06**

SLR-TA-3

Set No.	

Set P

M.Sc. (Semester - I) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY (CAMPUS)
Microbial Physiology and Metabolism (MSC01103)

Day & Date: Friday, 21-07-2023 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 A) Choose correct alternative. **16**

1) Fatty acid biosynthesis is activated by conversion of Acetyl CoA to the _____.
   a) Palmitate b) Acetyl CoASH
   c) Malonyl CoA d) None of the above

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

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

4) Which of the following is a correct statement for Na-K ATPase?
   a) 2 Na out and 3K in b) 3Na out and 2 K in
   c) 3K out and 2 Na in d) 2K out and 3 Na in

5) During respiration, which of the following processes occur only inside mitochondria and not cytoplasm?
   a) Glycolysis and the pentose-phosphate pathway
   b) Glycolysis and oxidative phosphorylation
   c) The citric acid cycle and oxidative phosphorylation
   d) Glycolysis and the citric acid cycle

6) Some of the free energy released in the mitochondrial electron transport chain produces form ATP. How many ATPs can be formed from electron transport of NADH to oxygen?
   a) 2.5 b) 2
   c) 1.5 d) 1

7) If person suffers from methanol consumption, detoxification of methanol is possible in hospital by treating the patient with _____.
   a) Toxins b) Glucose supply
   c) Ethyl alcohol d) Antibiotic treatment

8) Muscle cramp is observed due to vigorous contraction of muscles. This muscle cramp is due to depletion of oxygen. What will be the product formed in the end of glycolysis during muscle cramp?
   a) Lactic acid b) Citric acid
   c) Pyruvic acid d) Aspartic acid

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) Which of the following Pump in humans act as multidrug transporter (MDR1) responsible for the striking resistance of certain tumors to some generally effective antitumor drugs?
   a) ABC b) Ca
   c) CI-HCO_3 d) H-K

11) Malate dehydrogenase is not a NAD+ requiring enzyme.
   a) True b) False

12) Receptor mediated endocytosis from plasma membrane requires Catherin.
   a) True b) False

13) Carbon dioxide contribute the nitrogen atom to both purine and pyrimidine ring?
   a) True b) False

14) Anaplerotic reaction occurs in mammalian Liver and kidney.
   a) True b) False

15) TCA cycle, Fatty acid biosynthesis, β oxidation of fatty acid biosynthesis is processes occurs in Peroxisome.
   a) True b) False

16) In human stomach absorption of glucose transport in intestinal epithelial cells is carried out by Na-glucose symporter.
   a) True b) False

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

a) Write a note on PDH complex.
b) Write a note on Malate aspartate shuttle.
c) Write a note on cyclic ETC.
d) Explain in short saturated fatty acid biosynthesis.

Q.3 Answer the following.

a) Explain in brief TCA cycle and calculate ATP generation in TCA. **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 of cytochrome 450. **10**
b) Write a note on glycerol 3-phosphate shuttle. **06**

Q.5 Answer the following.

a) Define diffusion and explain in detail passive diffusion. **10**
b) Write a note on metabolism 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 endosymbiotic theory of mitochondria. **06**

Q.7 Answer the following.

a) What is ion transporter and explain in brief the mechanism of Na-glucose transporter in intestine. **10**

b) Write a note on pyrimidine nucleotide synthesis. **06**

SLR-TA-4

Seat No.	

Set P

M.Sc. (Semester - I) (New) (CBCS) Examination March/April-2023
MICROBIOLOGY (CAMPUS)
Bioinstrumentation and Biotechniques (MSC0108)

Day & Date: Saturday, 22-07-2023 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) Figure to right indicate full marks.

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

1) Which of the following instrument can be used to determine λmax 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) 1grams 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

6) Stationary phase in paper chromatography _____.
   a) Cellulose b) Paper
   c) Water d) Solvent

7) Rf value is _____.
   a) Retention factor b) Retardation factor
   c) Reverse Value d) All of above

8) Agarose in gel electrophoresis _____.
   a) Purified form of agar b) Synthesized from sea weed
   c) polysaccharide d) All of these

9) For Separation and characterization of protein which of the following technique is efficient _____.
   a) Agarose Electrophoresis b) SDS-PAGE
   c) Chromatography d) None of these

10) The part of microscope which helps to focus the object is _____.
a) Ocular b) Objective
c) Condenser d) Mirror

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

1) A solution that resists change in pH called _____.
2) Chromatography means Chromas _____ and Graphy _____.
3) Live bacteria can be visualized under _____ microscopy.
4) Atomic absorption spectroscopy is used to detect _____ concentration in ppm.
5) UV-Visible spectroscopy works on _____ Law.
6) Internal structure of cell can be visualized by using _____ microscope.

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 a) Describe in detail of transmission and scanning electron microscope. **08**
b) Give a detailed account of ion exchange chromatography. **08**

Q.4 a) What is ORD/CD. Give its principal, working for biological sample analysis. **08**
b) Describe in detail Polyacrylamide gel electrophoresis and comment on the difference between Native and SDS PAGE? **08**

Q.5 a) Describe the method of the western blotting technique. **08**
b) Explain the working construction and principle of the Atomic Absorption Spectroscopy. **08**

Q.6 a) Give details of general microscopy with respect to working construction and principles. **08**
b) Enlist types of a light microscopes. Give their applications. **08**

Q.7 a) Explain in detail the Henderson-Hasselbalch equation. **08**
b) Describe in detail about working, construction, and principal of High performance liquid chromatography. **08**

SLR-TA-6

Seat No.	

Set P

M.Sc. (Semester - II) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY (CAMPUS)
Molecular Biology and Genetic Engineering (MSC01201)

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) 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 pUCl 8?
   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-TA-7

Seat No.	

Set P

M.Sc. (Semester - II) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY (CAMPUS)
Immunology and Immuno Technology (MSC01202)

Day & Date: Sunday, 23-07-2023 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. **10**

1) Which of the following term is correct for a Innate immunity?
   a) First line of defense against infection
   b) Second line of defense against infection
   c) Third line of defense against infection
   d) Fourth line of defense against infection

2) Tears contain lysozyme and it is act a first line defense mechanism for protection of eye against _____.
   a) Fungi b) Virus
   c) Protozoa d) Bacteria

3) If a person was suffering from snake bite that person treated with antibodies to that toxin. Which of the following is correct term for that treatment?
   a) Artificially acquired passive immunity
   b) Naturally acquired active immunity
   c) Naturally acquired passive immunity
   d) Artificially acquired active immunity

4) If any bacteria are entering in human body, it will allow the interaction between antigen and antibody. If any antigen was injected in human body, which is the 1st antibody respond against that bacterial antigen?
   a) IgG b) IgM
   c) IgD d) IgE

5) Cell eating is a phenomenon observed in macrophages. If macrophages engulf bacterial solid cell particle termed as _____.
   a) Phagocytosis b) Pinocytosis
   c) Endocytosis d) Exocytosis

6) Monoclonal antibodies are produced by _____.
   a) Fermentation Technology b) Biotechnology
   c) Hybridoma technology d) None of these

7) Antibody mediated immune response is generated by _____ cell therefore they term as Humoral cell mediated immune respone.
   a) NK cell b) B cell
   c) T cell d) All of the above

8) Which of the following cell is indication of naive T cell?
   a) T cell contain CD4 marker
   b) T cell contain CD8 marker
   c) T cell contain both CD4 arid CD8 marker
   d) T cell lack of CD4 and CD8 marker

9) IgM is a specific type of antibody interacts with antigen to form precipitation quickly because of the following reason?
   a) It is act as divalent in nature
   b) It is act as pentavalent in nature
   c) It is act as tetrads in nature
   d) It is act as Monovalent in nature

10) Macrophages recognise self and non-self antigen by using a specific receptor. They are involved in degradation of infected cell and engulf that cell. Which of the following receptor is specific to detect self and non-self antigen?
   a) TCR and CD3 b) T cell and B cell
   c) MHC I and II d) All of the above

11) Complement fixation pathways are involved in degradation of both soluble and non-soluble pathogens. Which of the following pathway is activated in presence of antibody?
   a) The alternative pathway b) Classical pathway
   c) The lectin pathway d) All of the above

12) In class MHC II molecules contain α chain and β chain responsible to load antigen protein. Which of the following protein involved to blocking binding of endogenous protein?
   a) Invariant clip protein chain b) Non Invariant clip protein chain
   c) Endogenous protein d) Non Endogenous protein

13) 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

14) Which of the following can provide naturally acquired passive immunity for the new born?
   a) IgA b) IgG
   c) IgE d) IgM

15) Monoclonal antibody production is possible only when it provide specific media components for selection of hybrid cell. Which of the following media is used for selection of hybrid cell?
   a) Serum base + heigh concentration of HGPRT
   b) Serum base + antibiotic
   c) HAT + HGPRT and antibiotic
   d) HAT medium

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

Q.2 Answer the following **16**

a) Define innate immunity and explain its type.
b) Write appropriate characteristics of Class I MHC molecule.
c) Write a note on Type I diabetes.
d) Differentiate between Agglutination and precipitation

Q.3 Answer the following.

a) Explain in brief about Principle method and procedure of ELISA **10**

b) Write a note on Pernicious anemia. **06**

Q.4 Answer the following.

a) Write a note on cell involved in antigen presentation and its role. **10**

b) Write a short note on Oxygen dependent mechanism in Macrophages. **06**

Q.5 Answer the following.

a) Explain the role of secondary lymphoid organs involved in development of immune system. **10**

b) Write a short note on RIA. **06**

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Q.6 Answer the following.

a) Write in brief mechanism of NK cell associated apoptosis. **10**

b) Write a short note on Mannose binding lectin pathway. **06**

Q.7 Answer the following.

a) Explain in detail production, purification and application of Monoclonal antibodies. **10**

b) Write a short note on classical pathway. **06**

SLR-TA-8

Seat No.		Set	P

M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2023
MICROBIOLOGY (CAMPUS)
Medical Microbiology - I (Bacteriology and Parasitology) (MSC01206)

Day & Date: Tuesday, 25-02-2023 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 Choose correct alternative. **16**

1) Throat swab culture is not useful to diagnose _____.
   a) Streptococcal sore throat b) Diphtheria
   c) Thrush d) Pneumonia

2) If a disease is transferred from a lower animal to human beings, the disease is termed as _____.
   a) Congenital b) Iatrogenic
   c) Zoonotic d) Hereditary

3) Why Platyhelminthes are so called flat worms?
   a) Because the head is flat
   b) These animals have dorsoventrally compressed body
   c) The movement of the animal is to creep over the surface
   d) The alimentary canal is flattened

4) Which of the following dye/stain is used for the blood-smear staining and identification of *Plasmodia?*
   a) Lactophenol cotton blue b) Giemsa stain
   c) Safranin d) Crystal violet

5) Out of the following, which one is the infective form of malarial parasite?
   a) Oocyst b) Sporozoite
   c) Bradyzoite d) Tachyzoite

6) Black-water fever is a special manifestation of malaria caused by _____.
   a) *P. falciparum* b) *P. malariae*
   c) *P. ovale* d) *P. vivax*

7) A massive lesion caused by the spread of *Staphylococcus aureus* infection, often on the neck and upper back is called _____.
   a) Boil b) Abscess
   c) Furuncle d) Carbuncle

8) The pus producing skin infections (Pyoderma) can be caused by _____.
   a) *Staphylococci* b) *Streptococci*
   c) *Corynebacteria* d) All of the above

9) How *Toxoplasma* can be transmitted to humans?
   a) Ingestion of raw or inadequately cooked infected meat.
   b) Digestion of raw but adequately cooked infected meat.
   c) Exposure of humans to sunlight.
   d) Exposure of humans to UV light.

10) You have identified a new toxin which was produced by a gram-negative bacterium. The toxin is composed of protein, has high toxicity and is not heat stable. It also targets liver cells. Based on these characteristics, where would you classify this toxin from below names?
   a) Superantigen b) Endotoxin
   c) Exotoxin d) Leukocidin

11) Which are the important virulence factor/s that help in bacterial pathogenesis?
   a) Exotoxins and endotoxins
   b) Pili/ fimbriae
   c) Capsules
   d) All of the above

12) Which toxin is produced by *Streptococcus pyogenes?*
   a) Shiga like toxin b) Alpha toxin
   c) Erythrogenic toxin d) Cyanotoxin

13) *Staphylococcus aureus* releases various types of toxins that increase the virulence of the bacteria, select the toxins released by *Staphylococcus aureus.*
   a) Aflatoxin b) Mycotoxin
   c) Enterotoxin d) None of the above

14) Catalase test is the common biochemical test used for the identification of various bacteria but which of the following bacteria do not have this enzyme?
   a) *Enterobacter* b) *Pseudomonas*
   c) *Corynebacterium* d) *Streptococci*

15) Name the bacteria that cause toxic shock syndrome.
   a) *Staphylococcus epidermidis*
   b) *Staphylococcus aureus*
   c) *Staphylococcus intermedius*
   d) *Streptococcus epidermidis*

16) Some bacteria and fungi need an iron receptor molecule for the growth, which is also an important virulence factor of bacterial pathogenesis. What is it called?
   a) Siderophores b) Ionophores
   c) Siderocytes d) None of the above

Q.2 Answer the following **16**

1) Write a note on laboratory diagnosis of diphtheria.
2) Write appropriate methods of sample collection and transportation.
3) Write a note on life cycle of *Cryptosporidium parvum.*
4) Explain Morphology and Lab diagnosis of *Entamoeba histolytica.*

Q.3 Answer the following.

1) Explain in brief about serological test by antigen antibody detection and antigen antibody susceptibility test. **10**
2) Write a note on staphylococcal food poisoning bacteria. **06**

Q.4 Answer the following.

1) Explain in brief about identification of bacteria by using following methods like gram staining, different types of media, biochemical test. **10**
2) Write a short note on Fluorescent microscopy. **06**

Q.5 Answer the following.

1) Explain in detail about Morphology, symptoms, life cycle, lab diagnosis and treatment of pepticulcer by *helicobacter.* **10**
2) Write a short on *Mycoplasmal pneumonia.* **06**

Q.6 Answer the following.

1) Write in brief about life cycle and treatment of *T.saginata* and *T.solium.* **10**
2) Write a short note on symptoms and life cycle of Malaria. **06**

Q.7 Answer the following.

1) Write in brief about *W. Bancrofti* with respect transmission, laboratory diagnosis, prophylaxsis and treatment. **10**
2) Write a short note on bacterial Meningitis. **06**

SLR-TA-10

Seat No.	

Set P

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

Day & Date: Monday, 10-07-2023 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 A) Choose correct alternative. **10**

1) Who perform regular audits and inspections documents in pharmaceutical industries?
   a) Research and Development Microbiologist
   b) Quality assurance executive Microbiologist
   c) Quality control executive Microbiologist
   d) Production Microbiologist

2) Which radiation is used for sterilization of disposable medical devices in pharma industries?
   a) Alpha radiation b) Beta radiation
   c) Gamma radiation d) Delta radiation

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

4) Which microorganisms typically associated with contamination from air in cleanroom facility of pharma industry?
   a) *Bacillus spp.*
   b) *Staphylococcus spp.*
   c) *Pseudomonas spp.*
   d) *Escherichia spp.*

5) What is the mechanism of action of Chloramphenicol?
   a) It inhibits the transcription in bacteria
   b) It inhibits the DNA replication in bacteria
   c) It inhibits the cell wall synthesis in bacteria
   d) It inhibits the protein synthesis in bacteria

6) How microbes enter from human source in pharmaceutical product?
   a) Through hand gloves b) Through skin cells
   c) Through cloth d) Through shoes

7) What is the unit of bioburden determination in pharmaceutical product?
   a) Number of fungal colonies
   b) Number of bacterial cells
   c) Number of bacterial colonies
   d) Colony forming units

8) Which bacteria is used to test membrane filter during in process bioburden determination of aseptically filled pharma product?
   a) *Bacillus subtilis* b) *Serratia marcescens*
   c) *E.coli* d) *Salmonella typhi*

9) What is checked by auditor during microbiology lab audit in equipment section of pharma industry?
   a) Equipment size b) Equipment name
   c) Calibration certificate d) Equipment location

10) Which is an example of National level Pharmacopoeia?
   a) European Pharmacopoeia
   b) International Pharmacopoeia
   c) United Nations Pharmacopoeia
   d) US Pharmacopoeia

B) Write true/false **06**

1) Autoclave indicator tape is one of the Chemical indicators of sterilization.
2) The blood of Horseshoe carb used in LAL test is red colored.
3) Tetracycline is used for the treatment of fungal disease Mucormycosis.
4) Total aerobic microbial count (TAMC) is the term used to count bacteria in bioburden determination.
5) EMB agar is used in Completed test of MPN.
6) Contact plate method is used for air sampling in clean room facility.

Q.2 Answer the following **16**

a) Write a short note mechanism of action of Penicillin antibiotic.
b) Write a short note on sources of contamination in pharmaceutical products.
c) Write a short note on gaseous sterilization.
d) Write a short note on chemical indicator of sterilization.

Q.3 Answer the following.

a) Explain in brief about mechanism of action of Sulfonamides, Quinolones and Chloramphenicol. **10**
b) Write a note on mechanism of action of Amphotericin B and 5-fluorocytosine. **06**

Q.4 Answer the following.

a) Write in brief about LAL test and Chromogenic assay for detection of pyrogen and endotoxin in pharmaceutical product. **10**
b) Write a short note on physical and biological indicators of sterilization. **06**

Q.5 Answer the following.

a) Write in brief about in microbiological environmental monitoring and clean room testing. **10**
b) Write a short note on Cleanroom classification and certification. **06**

Q.6 Answer the following.

a) Write in brief about pharmaceutical microbiology laboratory management. **10**
b) Write a short note on Quality assurance in pharmaceutical industries. **06**

Q.7 Answer the following.

a) Role of the company regulatory affairs department, pharmacovigilance and documentation. **10**
b) Write a short note on Vaccine clinical trial processes. **06**

SLR-TA-11

Seat No.		Set	P

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

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. (MCQ) **10**

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

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

3) Categorical data, Problems 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

6) Nucleic acid sequenced by which of the following method _____.
   a) Sangers method b) Maxum and Gillbert method
   c) di-deoxymethod d) All of the above

7) Chain of amino acid molecule is called _____.
   a) Protein b) Polypeptide
   c) Peptide d) All of the above

8) To study lineage and pedigree analysis, which subject is essential _____.
   a) Pedagogy b) Bio informatics
   c) population genetics d) Inheritance biology

9) Null hypothesis is _____.
   a) assertive to the hypothesis
   b) Negative to the hypothesis
   c) Hypothesis
   d) All of the above

10) To construct protein analogue what is important _____.
   a) protein folding b) protein blotting
   c) protein docking d) protein synthesis

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

1) EBI is European _____ institute.
2) β - sheets and β - loops of protein represents _____ structure.
3) The average value from given data represents _____.
4) The deviation of average value is _____.
5) The midpoint of degrees of freedom is _____.
6) Proteases are _____ degrading enzymes.

Q.2 Write a short note on following. **16**

a) ExPASy data base.
b) Gene Bank.
c) Standard deviation.
d) Karl Pearson coefficient.

Q.3 a) Describe in detail protein data bank with reference to ExPASy. **08**
b) Give detail account of nucleotide data bank. **08**

Q.4 a) What is PDB. Give its significance to analyse protein structure. **08**
b) How the structure of protein determine by using structural databases. **08**

Q.5 a) What are different software's to visualize secondary and tertiary structure of protein. **08**
b) What is molecular docking. Give its significance in microbiology. **08**

Q.6 a) Define following terms: **10**
   a) Statistics
   b) Biostatistics
   c) Mean
   d) Mode
   e) Standard deviation

b) Enlist different graphical methods for representation of data, Give their suitable example? **06**

Q.7 a) What difference between Binomial and Poisons ratio. **08**
b) Solve the problem? **08**
In a cross between black and white coat color mice, the F2 individual segregated in to 787 black and 277 white coat colors individuals. If you have to test that these result agree with the expected ratio 3:1 then apply chi-square P = 5%. Set the null hypothesis, alternative hypothesis.

SLR-TA-12

Seat No.	

Set P

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

Day & Date: Wednesday,12-07-2023 Max. Marks: 80
Time: 11:00 AM To 02:00 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 Choose the correct alternatives from given option. **10**

1) Polio virus infect can infect intestinal tissue and through enter blood to nerve tissue. Polio virus receptor can attach to the tissue via specific receptor. Which of the following receptor require polio virus attachment?
   a) RLM155 b) CLT122
   c) CD155 d) TMPL144

2) If person was suffering to any viral infection and serological sample is used in detection and confirmation of presence and absence of virus by using following technique, choose appropriate efficient technique for virus detection?
   a) Hemagglutination technique
   b) ELISA technique
   c) Ag-Ab test
   d) DNSA method

3) In case of patients suffering from fungal infection. After proper treatment doctor observed that patients shows reinfection of fungus in successive time period. What is the possible reason that fungal infection is observed in those patients?
   a) Proper treatment is not prescribed by doctor
   b) Fungus has ability to form spore inside the cell so in favorable condition developed diseased
   c) Fungus has long hyphae so they can spread all over the body
   d) According to life cycle completion they observed in successive time period

4) In corona pandemic situation we are refer N95 mask for our precaution purpose. It is possible to avoid infection of corona virus? What is the size of corona virus?
   a) 90 to 100 nm b) 80 to 120 nm
   c) 100 to 120 nm d) 50 to 80 nm

5) According medical microbiology Candidiasis is a fungal infection due to any type of Candida a type under consideration of following type. Choose appropriate type of Candida?
   a) It is a mold
   b) It is Pleuromorphic mucor
   c) It is Pleuromorphic yeast
   d) It is undistinguishable fungi

6) If ‘X’ person was suffered formed viral infection. If you act as lab technician and you have to treat that sample and diagnose that viral culture. Which of the following sequence is correct for detection of viral culture?
   a) Microscopic diagnosis, ELISA, PCR.
   b) ELISA, PCR, Rapid Ag test.
   c) PCR, Rapid Ag test, Nano-drop technique.
   d) Rapid Ag test, PCR, Microscopic diagnosis

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

8) Culex tritaeniorhynchus, a rice field breeding mosquito is the major vector act for transmission of following virus?
   a) Japanese encephalitis Virus
   b) Corona virus
   c) Cytomegalovirus
   d) Hepatitis virus

9) If you are vaccinated with corona body will responds it and produces antibodies. Which of the following antibodies are primarily synthesis our immune systems?
   a) IgA b) IgE
   c) IgG d) IgM

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
   b) Adenovirus d) CMV

11) SARS -CoV-2 virus infection shows different symptoms and some duration of time it will be recover. 30 days are the incubation period of virus in Human.
   a) True b) False

12) Influenza viruses represent the largest nonenveloped viruses because they are the maximum size able to be transported through the endosome.
   a) True b) False

13) Rapid antigen determines by using antibody. VP 6 protein is specially detectable in rotavirus.
   a) True b) False

14) Aedes mosquitoes are also responsible to spread some disease mainly they are act as carrier for some Ebola viruses. Which of the following viruses are transmitted from mosquitoes except?
   a) True b) False

15) Herpes virus is responsible to formation of warts?
   a) True b) False

16) Foetal microcephaly symptoms were observed in Arbovirus.
   a) True b) False

Q.2 Answer the following **16**

a) Write a note on clinical poliomyelitis.
b) Write a note on pathogenicity and diagnosis of Ebola virus.
c) Write a note on Gene therapy in covid-19.
d) Explain in short mode of action of HPV and its treatment.

Q.3 Answer the following.

a) Write in detail on structure, genomic organization, pathogenesis and control of Rota virus. **10**
b) Write a note on mode of transfer and explain its diagnosis and treatment of cytomegalovirus. **06**

Q.4 Answer the following.

a) Explain in detail structure, genomic organization, pathogenesis and control of poliovirus. **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) What is Japanese encephalitis? Explain its mode of transmission and treatment of JPV. **06**

Q.6 Answer the following.

a) Explain in detail how does vaccine therapy works in COVID-19 and 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-TA-14

Seat No.	

Set P

M.Sc. (Semester - IV) (New) (CBCS) Examination March/April-2023
MICROBIOLOGY (CAMPUS)
Research Methodology (MSC01401)

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

Instructions: 1) Question 1and 2 are compulsory.
2) Attempt any Three from Q.3 to Q.7
3) All questions carry equal marks.

Q.1 A) Choose the correct alternatives from the given options. **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-TA-15

Seat No.	

Set P

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

Day & Date: wednesday,12-07-2023 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 from given option. **10**

1) Which one of the following is a primary containment device?
   a) Centrifuge rotor b) Standard animal cage
   c) Clean air bench d) Gasketed centrifuge cups

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

3) Which of the following practices are not allowed in the laboratory?
   a) Eating and Drinking b) Applying Cosmetics
   c) Handling Contact Lenses d) All of the above

4) 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

5) Which of the following statements about Personal Protective Equipment (PPE) are correct?
   a) PPE should be worn and stored only inside the laboratory
   b) PPE should be chosen based upon the work being completed
   c) Employees utilizing PPE should be properly trained
   d) All of the above

6) When working with infectious biological material, the best place to perform the work would be _____.
   a) In a Biological Safety Cabinet
   b) On the laboratory bench
   c) On a clean bench, wearing a dust mask
   d) In a Fume Hood

7) Biosafety is working safely with biological material or organisms with potential to cause disease in:
   a) Animals b) Plants
   c) Humans d) All the above

8) Cryptococcus neoformans would be handled at which Risk Group?
   a) Risk Group 1 b) Risk Group 2
   c) Risk Group 3 d) None of the above

9) Which one of the following is a primary containment device?
   a) Centrifuge rotor b) Standard animal cage
   c) Clean air bench d) Gasketed centrifuge cups

10) A Biosafety Level 3 facility should have which type of air pressurization?
   a) Neutral b) Positive
   b) Negative d) Atmospheric

11) A vaccine to which of the organisms listed below must be offered to personnel working with human blood cells?
   a) Hepatitis A virus b) Hepatitis B virus
   c) Clostridium tetani d) Plasmodium falciparum

12) The process by which all living cells, spores, and acellular entities are either destroyed or removed from an object or habitat is called disinfectant.
   a) True b) False

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

14) It is okay to wear sandals in the lab as long as you also wear socks.
   a) True b) False

15) You can find all the safety information for your facility's chemical products by viewing the MSDS sheets.
   a) True b) False

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

Q.2 Answer the following **16**

a) Define biosafety and mention its levels.
b) Write a note on Transfer of specimen within a building.
c) Write a note on Review risks and risk control measures of risk assessment.
d) Explain in short Category A and B infectious substances.

Q.3 Answer the following.

a) Explain in brief about Assigned roles and responsibilities in biosafety program managements. **10**
b) Write a note on specimen Transfer between buildings on the same site **06**

Q.4 Answer the following.

a) Write a note on Personal protective equipment in heightened control measures. **10**
b) Write a note on Training programme. **06**

Q.5 Answer the following.

a) Write a note on Decontamination and waste management. **10**
b) Write a note on Electrical hazards. **06**

Q.6 Answer the following.

a) Write a note on General rules regarding chemical incompatibilities. **10**

b) Write a note on WHO laboratory biosafety guideline related to COVID-19. **06**

Q.7 Answer the following.

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

b) Write a short note on Biosecurity risk assessment. **06**