



Seat No.	
-------------	--

M.Sc. – I (Semester – I) (New CBCS) Examination, 2016
MICROBIOLOGY
Paper – I : Cytology and Taxonomy of Microorganisms

Day and Date : Tuesday, 29-3-2016

Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions:** 1) *Part – I is compulsory.*
2) *From Part – II attempt any four.*
3) *Figures to the right indicate full marks.*

PART – I

1. Rewrite the sentences by selecting correct alternative : 14
- 1) The similarity between bacterium and cyanobacterium is in the presence of
a) Nucleoid b) Cell wall c) Cell membrane d) Pili
 - 2) In blue green algae photosynthesis takes place in
a) Chromatophore b) Carboxysome
c) Chloroplast d) Lamellae
 - 3) Soredia are formed during reproduction in
a) Rickettsia b) Viruses c) Lichens d) Actinomycetes
 - 4) Motility of bacteria is the following taxonomic character
a) Morphological b) Serological c) Genetic d) Biochemical
 - 5) Special group of bacteria that contains Filamentous hyphae are
a) Mycoplasma b) Mycobacteria
c) Actinomycetes d) Acenitobacter
 - 6) 'Q' Fever is caused by
a) Clostridium tetani b) Coxiella burnetti
c) Corynebacterium d) Cyanobacterium
 - 7) Protein rich alga is
a) Chlamydomonas b) Spirulina
c) Cosmarium d) Cyanobacterium



Seat No.	
----------	--

**M.Sc. Part – I (Semester – I) Examination, 2016
(New – CBCS)
MICROBIOLOGY (Paper – II)
Microbiological Techniques and Scientific Writing**

Day and Date : Thursday, 31-3-2016
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- N.B. :** 1) *Part – I question 1 is compulsory.*
2) *Attempt any four questions from Part – II.*
3) *Figures to the right indicates full marks.*
4) *Answer to the two Parts should be written in the same answer book.*

PART – I

1. Rewrite the following sentences by selecting the correct answer from given alternatives.

14

- 1) Protein separation techniques are often based on the following properties except _____
- a) solubility of a protein b) viscosity of the protein
c) charge of the protein d) specific binding affinity of the protein
- 2) In gel electrophoresis, the tracking dye moves _____
- a) more slowly than all the different molecules of the sample.
b) at the same rate as all the different molecules of the sample.
c) more quickly than all the different molecules of the sample.
d) not at all.
- 3) The sucrose gradients are typically used for separation of _____
- a) cellular organelles b) nucleic acids
c) proteins d) enzymes



- 4) A pressure induced separation of solutes from a solvent through a semi permeable membrane is the basic operating principle of _____
- a) ultrafiltration b) filtration c) gel filtration d) reverse osmosis
- 5) A _____ is used between ligand and the gel matrix in affinity chromatography.
- a) selective group b) non specific molecules
c) spacer arm d) cross linked dextran
- 6) High performance liquid chromatography (HPLC) cannot be used to _____
- a) separate different types of organic pesticides
b) determine the mercury content of a fish sample
c) identify the various pigments from a leaf extract
d) determine the caffeine content of coffee samples.
- 7) In anion exchange chromatography _____
- a) the column contains negatively charged beads where positively charged protein binds
b) the column contains positively charged beads where negatively charged protein binds
c) the column contains both positive and negatively charged beads where proteins bind depending upon their net charge
d) the column does not contains charged beads
- 8) _____ presents the previously published facts and theories in a particular field.
- a) A review paper b) An abstract
c) The material and method d) The result and discussion
- 9) Any significant technical help received from any individual, source of special equipment, cultures or other materials is acknowledged in _____
- a) Abstract b) Results
c) Acknowledgement d) Conclusion



- 10) The most suitable gas to use as a carrier gas in a gas chromatogram is _____
- a) Methane b) Oxygen c) Helium d) Carbon dioxide
- 11) The use of insulin hormone to purify its receptor is an example of _____
- a) Affinity chromatography b) Ion exchange chromatography
c) Gel filtration chromatography d) TLC
- 12) A microscope in which an image is formed by passing an electron beam through a specimen and focusing the scattered electrons with magnetic lenses is called as _____
- a) transmission electron microscope
b) scanning electron microscope
c) phase-contrast microscope
d) dark field microscope
- 13) The pores of ultra filtration membranes can remove particles of _____ from fluids.
- a) 0.1 – 1 μm b) 0.01 – 1 μm c) 0.001 – 0.1 μm d) 1 – 10 μm
- 14) _____ of the research paper should never contain abbreviations, chemical formulas, proprietary names, jargon and alike.
- a) Title b) Introduction
c) Result and discussion d) Abstract

PART – II

Attempt **any four** questions.

2. Describe the principle, method and applications of differential centrifugation. **14**
3. Explain principle, materials and applications of ion exchange chromatography. **14**
4. Describe the methods of validation and calibration of equipments in laboratories. **14**



5. Write short answers (**any two**) : **14**

- a) Discuss RNA electrophoresis.
- b) Give the guidelines for preparation and submission of proposals to the funding agencies.
- c) Describe principal and applications of TLC.

6. Write short notes on (**any two**). **14**

- a) Enrichment and isolation of algae.
 - b) Basic concept of scientific writing.
 - c) Staining of specimens for electron microscopy.
-



Seat No.	
-------------	--

**M.Sc. (Part – I) (Semester – I) Examination, 2016
(CBCS) (New)
MICROBIOLOGY
Paper – III : Recent Trends in Virology**

Day and Date : Saturday, 2-4-2016
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

- Instructions:** 1) Part – I, Question 1 is **compulsory**.
2) Attempt **any 4** questions from Part – II.
3) Figures to the **right** indicates **full** marks.
4) Answer to the Part – I and Part – II are to be written in **same** answer booklet only.

PART – I

1. Rewrite the sentence by choosing correct alternative from the following : **14**
- 1) In _____, tissue cells do invade surrounding tissues.
a) Non-malignant tumors b) Malignant tumors
c) Non malignant wart d) Benign warts
 - 2) _____ lacks protective capsid around the nucleic acids.
a) Slow viruses b) Viroids c) Prions d) Naked Viruses
 - 3) _____ is suitable for cultivation of plant viruses.
a) Embryonated Chicken Egg b) Tissue culture
c) Lab animals d) Tumor cells
 - 4) Hubner and Todaro proposed _____ theory.
a) Provirus b) Proto virus
c) Oncogene d) Somatic mutation
 - 5) Rous Sarcoma virus causes _____ in mice.
a) Breast Cancer b) lymphoma
c) Small pox d) Hepatitis



- 6) Polystyrene latex is used for enumeration of viruses in sample by _____
- a) Pock method
 - b) Direct microscopic count
 - c) Acid end point method
 - d) Hemagglutination assay
- 7) An example of an artificial virus is _____
- a) Rabies virus
 - b) Vaccinia virus
 - c) Mumps virus
 - d) Reo virus
- 8) One step Growth Experiment was devised by _____
- a) Watson
 - b) Crick
 - c) Lederberg
 - d) Delbruk
- 9) When viral infection is only remain localized as a compact mass without invading surrounding tissues is called as _____
- a) Benign warts
 - b) Malignant tumors
 - c) Malignant wart
 - d) Cancer
- 10) _____ virus can undergo antigenic shift and antigenic drift.
- a) Rabies
 - b) Hepatitis
 - c) Influenza
 - d) Pox
- 11) _____ is temperate phage.
- a) λ
 - b) T4
 - c) T3
 - d) θ X174
- 12) _____ is with both RNA and DNA in it as its genome.
- a) HIV
 - b) Reovirus
 - c) Human cytomegalovirus
 - d) Raus Sarcoma virus
- 13) Potato spindle tuber disease is caused by _____
- a) Virus
 - b) Prions
 - c) Viroids
 - d) Exons
- 14) LHT system of viral classification grouped DNA viruses into _____ class.
- a) Retroviruses
 - b) Retroviridae
 - c) Ribovira
 - d) Deoxyivira



PART – II

Attempt **any four** questions from the following :

2. Take a detail account on structure, genomic organization, pathogenesis and control of Human Immunodeficiency Virus (HIV). **14**
 3. Explain in detail multiplication of Bacteriophages. **14**
 4. Write short answer on **any two** of the following : **14**
 - a) Describe in detail control of viral infections with vaccines and chemotherapeutic agents.
 - b) Briefly describe Emerging viral infections.
 - c) What is viral assay ? Describe in brief the Infectivity Assays.
 5. Write short answers (**any two**) : **14**
 - a) Draw labeled diagram of the TMV and add a note on its pathogenesis.
 - b) Briefly describe host and virus factors involved in virus adsorption and entry in to the host cell.
 - c) Describe in detail cultivation of viruses.
 6. Write short notes on (**any two**) : **14**
 - a) Viroids
 - b) Viruses pathogenic to algae and fungi
 - c) Satellite viruses and their role in plant virus replication.
-



Seat No.	
-------------	--

M.Sc. – I (Semester – I) (New-CBCS) Examination, 2016
MICROBIOLOGY (Paper – IV)
Microbial Chemistry and Enzymology

Day and Date : Tuesday, 5-4-2016

Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions:** i) *Part – I is compulsory.*
ii) *From Part – II attempt any four.*
iii) **All** questions carry **equal** marks.
iv) Figures to the **right** indicate **full** marks.
v) Draw **neat** and labelled diagrams.

PART – I

1. Rewrite the following sentences by using correct alternatives : **14**
- 1) Rhamnose is
- a) Oligosaccharide b) Monosaccharide
c) Trisaccharide d) Polysaccharide
- 2) _____ is imino acid.
- a) alanine b) tryptophan
c) aspartic acid d) proline
- 3) _____ is called provitamin.
- a) Biotin b) Carotene c) Niacin d) Thiamine
- 4) Bacteriorhodopsin is bacterial cell membrane
- a) Carbohydrate b) Protein
c) Teichoic acid d) Lipid



PART – II

2. Give detail account of nomenclature, basic structure and types of carbohydrates. **14**
 3. Describe in detail types of lipids and their structural aspects. **14**
 4. Write an essay on catalytic mechanism of enzymes with reference to acid base and covalent catalysis, electrochemical reactions. **14**
 5. Write short notes on (**any two**) : **14**
 - a) Sterols and terpenes.
 - b) Specificity of enzymes.
 - c) Significance of MM and KM.
 6. Write short notes on (**any two**) : **14**
 - a) Multienzyme system.
 - b) Methods used for identification of functional groups in the active site.
 - c) Helix coil transition.
-



PART – II

Attempt **any four** questions :

2. Explain in detail the duplication of bacterial chromosomal DNA. **14**
 3. What is genetic complementation ? Explain in detail intergenic and intragenic complementation and add a note on cistrans test of genetic function. **14**
 4. Give the detailed account of deciphering of genetic code and its properties. **14**
 5. Write short answers (**any two**) : **14**
 - a) Detection and purification of plasmids
 - b) Structure of rRNA and tRNA
 - c) Alternative forms of DNA.
 6. Write short notes on (**any two**) : **14**
 - a) Antisense RNA and its significance
 - b) PCR
 - c) DNA damage and repair.
-



Seat No.	
-------------	--

M.Sc. – I (Semester – II) (New) (CBCS) Examination, 2016
MICROBIOLOGY (Paper – VI)
Microbial Physiology and Metabolism

Day and Date : Friday, 1-4-2016

Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

- Instructions :** 1) From Part I, Question 1 is **compulsory**.
2) From Part II, attempt **any four** questions.
3) Figures to the **right** indicate **full** marks.

PART – I

1. Rewrite the sentences by selecting correct alternative : **14**
- 1) Cytochromes are
a) lipids b) lipoproteins c) proteins d) carbohydrates
 - 2) In anaerobic respiration terminal electron acceptor is
a) O₂ b) H₂O c) H₂ d) CO₃
 - 3) _____ is precursor for inosinic acid.
a) Ribose-5 b) Ribose-1,5 diphosphate
c) Ribulose-1, 5 diphosphate d) Ribulose-5(p)
 - 4) NAD and NADP are _____ for dehydrogenases.
a) cofactor b) coenzyme
c) prosthetic group d) apoenzyme
 - 5) Phosphotransferase system catalyses phosphorylation of _____ during group translocation.
a) amino acids b) vitamins c) nucleotides d) sugars
 - 6) The enzyme catalysing exchange of Na⁺ and K⁺ is called
a) Na⁺ K⁺ permease b) Na⁺ K⁺ transferase
c) Na⁺ K⁺ phosphatase d) Na⁺ K⁺ ATPase



SLR-MO – 557

Seat No.	
-------------	--

M.Sc. – I (Semester – II) (New-CBCS) Examination, 2016
MICROBIOLOGY
Paper – VII : Biophysics and Bioinstrumentation

Day and Date : Monday, 4-4-2016
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

- Instructions :** 1) *Part I, Q. 1 is compulsory.*
2) *Attempt any 4 questions from Part II.*
3) *Figures to the right indicates full marks.*
4) *Answer to the Part I and Part II are to be written in same answer booklet only.*

PART – I

1. Rewrite the sentences after choosing correct answer from the given alternative. **14**
- 1) Radio Immunoassay was first developed by _____
 - a) Rosalyn Yalow and Samuel Berson
 - b) Samuel Merson
 - c) Both a) and b)
 - d) None
 - 2) In ELISA, the solid phase consist of _____
 - a) Cross-linked beads
 - b) Polyacrylamide dextran
 - c) Filter paper disc
 - d) None of these
 - 3) In Enzyme Linked Immunosorbent Assay _____ enzyme may be used.
 - a) Alkaline Peroxidase
 - b) Horseshoe phosphatase
 - c) p-nitrophenyl phosphatase
 - d) None of these
 - 4) The half life of phosphorus radioisotopes is _____
 - a) 15.2 year
 - b) 14.3 days
 - c) 8.1 days
 - d) 87.1 days

P.T.O.



- 14) Thermal denaturation of protein involves _____
- a) Conformation change in the protein
 - b) Random cleavage of peptide bonds
 - c) Covalent modification of certain amino acids
 - d) Increase in its isoelectric point

PART – II

2. Describe in detail UV-Visible Spectrophotometry. **14**
3. Give a detail account of 'Methods of detection and measurement of radioactivity'. **14**
4. Give a detail account on Autoradiography and comment on its applications. **14**
5. Write short answers (**any two**) : **14**
- i) Discuss briefly the 'Immuno-electrophoresis'.
 - ii) Give brief account of "Nanometry".
 - iii) Describe in brief Electrochemical techniques.
6. Write short answers (**any two**) : **14**
- a) Discuss briefly "Immunohistochemistry".
 - b) Briefly describe "Turbidimetry".
 - c) Describe in detail "Fluorimetry".
-



Seat No.	
-------------	--

M.Sc. I (Semester – II) (New – CBCS) Examination, 2016
MICROBIOLOGY (Paper – VIII)
Microbial Ecology and Diversity

Day and Date : Wednesday, 6-4-2016
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

- N.B. :** 1) Question 1 from Part – I is **compulsory**.
2) Attempt **any four** questions from Part – II.
3) Part – I and Part – II should be written in same answer book.
4) Draw well labelled diagrams **wherever** necessary.

PART – I

1. Rewrite the following sentences by selecting correct answer from given alternatives.

14

- i) In a grassland top consumers are _____
a) Fungi b) Bacteria c) Carnivorous d) Herbivorous
- ii) Lichens are described as indicators of _____
a) Air pollution b) Xerophytic succession
c) Water pollution d) Mesophytic succession
- iii) The effect of pollution is mainly on _____
a) Crop rotation b) Ecological balance
c) Mutation d) Cell division
- iv) Marine bacteria grow best at salt concentration of _____ %
a) 2.5 to 4 b) 0.5 to 1 c) 1 d) 1 to 2
- v) Actinomycetes is a link between bacteria and _____
a) Viruses b) Fungi c) Rickettsia d) Protozoa
- vi) Parmelia is a common example of
a) Algae b) Lichens c) Bacteria d) Fungi



- vii) VAM help the plants in _____
- a) phosphate nutrition b) nitrogen fixation
c) absorption of minerals d) CO₂ fixation
- viii) A better idea of the productivity of an ecosystem can be obtained by _____
- a) Pyramid of number b) Inverted pyramid
c) Pyramid of biomass d) Pyramid of energy
- ix) The cyanobacteria members generally present in soil are _____
- a) Nostoc and anabaena b) Rhizobium
c) Chlamydomonas d) Azotobacter
- x) The community in equilibrium with environment is called _____ community.
- a) Co action b) Climax c) Ecesis d) Stratification
- xi) The development of bare area without any life form is called _____
- a) Migration b) Ecesis c) Nudation d) Aggregation
- xii) The richest and the most threatened reservoirs of plant and animal life on earth are _____
- a) National Parks b) Host Spots c) Green Pots d) Hot Spots
- xiii) Organisms linked in a food chain represent _____
- a) Trophic levels b) Ecosystem c) Community d) Food Web
- xiv) An ecological food chain can not begin in the absence of _____
- a) Producers b) Decomposers c) Consumers d) Carnivorous

PART – II

Attempt **any four** questions from the following .

2. Give general characteristics of purple and green sulphur bacteria. **14**
3. Write an essay on microbe-microbe interactions. **14**



4. Give an account of microbes in waste containing pesticides, heavy metals and radioisotopic material. **14**
5. Write short answers (**any two**). **14**
- i) Significance of halophilic microorganisms.
 - ii) Write general characteristics of yeasts.
 - iii) Explain role of microbes in acid mine drainage.
6. Write short notes on (**any two**) : **14**
- i) Ecological niches
 - ii) Ecosystem and habitats
 - iii) Coal desulphurisation.
-



Seat No.	
-------------	--

**M.Sc. – I (Semester – II) Examination, 2016
MICROBIOLOGY (CGPA) (Old)
Microbial Genetics (Paper – V)**

Day and Date : Wednesday, 30-3-2016
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

- Instructions:** 1) Part – I, Question 1 is **compulsory**.
2) Attempt **any four (4)** questions from Part II.
3) Figures to the **right** indicate **full** marks.
4) Answers to Part – I and Part – II are to be written in **same** answer booklet **only**.

PART – I

1. Rewrite the sentences after choosing correct answer from the given alternative. **14**
- 1) According to Oparin's theory source of energy for different chemical reaction leading to formation of 'primordial soup' was _____
a) from volcanoes, electrical discharges and solar energy
b) none of these
c) only heat from volcanoes
d) only electrical discharges
 - 2) Okazaki fragments are synthesized in _____ direction.
a) opposite
b) same
c) any
d) no relation of the replication fork
 - 3) In PCR _____ DNA polymerase is used.
a) type I b) type II c) type III d) type IV
 - 4) In one minute DNA polymerase I can add about _____
a) 150 bases b) 300 bases c) 600 bases d) 1200 bases



- 5) SOS response brings to halt _____
- a) DNA synthesis b) RNA synthesis
c) Protein synthesis d) Carbohydrate synthesis
- 6) Transposons can be delivered to bacteria through _____
- a) Phages & plasmids b) Pili
c) Flagella d) None of these
- 7) Genes for the degradation of hydrocarbons are carried by _____
- a) lytic transposons b) catabolic transposons
c) degradative transposons d) non-composite transposons
- 8) In *Archaea* translation is matching more to _____
- a) Bacteria b) Yeasts c) Eukaryotes d) Mitochondria
- 9) _____ has the smallest chromosome.
- a) *Mycobacterium* b) *E.coli*
c) *Salmonella* d) *Mycoplasma*
- 10) DNA ligase can join strands with _____
- a) cohesive ends b) blunt ends
c) non-cohesive ends d) all
- 11) Production of antibiotics by microbes is mostly controlled by
- a) integrons b) transposons
c) plasmids d) chromosomal genes
- 12) The methionine carried by *Archaeal* initiator tRNA is _____
- a) N-formylated b) non-N formylated
c) N-methylated d) a & c
- 13) Most abundant class of organisms on earth are _____
- a) insects
b) plants
c) parasites of unicellular organisms (UOPs)
d) bacteria
- 14) Jumping genes were discover by _____
- a) Barbara McClintock b) Beadle and Tatum
c) Lederberg d) Delbruck



PART – II

2. What is finger printing ? Explain the techniques and applications of DNA foot printing and DNA finger printing. 14
 3. Explain in detail Translation in Prokaryotes and Eukaryotes. 14
 4. Write an essay on “Mobile elements in Prokaryotes and Eukaryotes”. 14
 5. Write in short on **any two** of the following : 14
 - a) Deciphering of genetic code and important properties of genetic code.
 - b) Origin of life.
 - c) Genetic counseling.
 6. Write short notes on **any two** of the following. 14
 - a) Alternative forms of DNA.
 - b) Genetic disorders and differential gene activity.
 - c) One gene one polypeptide hypothesis.
-



Seat No.	
----------	--

M.Sc. – II (Semester – IV) (CGPA) Examination, 2016
MICROBIOLOGY
Paper – XIII : Immunology and Immuno-Technology

Day and Date : Wednesday, 30-3-2016
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

- Instructions:** 1) Part – I, Question No. 1 is **compulsory**.
2) Attempt **any four (4)** questions from Part II.
3) Figures to the **right** indicate **full** marks.
4) Answers to Part – I and Part – II are to be written in **same** answer booklet only.

PART – I

1. Rewrite the sentences after choosing correct answer from the given alternatives. 14
- i) IgE _____
a) is bound together by J chain
b) binds to mast cell through its Fab region
c) differ from IgG Ab because of its H chains
d) is present in high concentration in serum
- ii) Cytokines are _____
a) low molecular wt proteins b) high molecular weight
c) both a) and b) d) none of these
- iii) _____ is secondary lymphoid organ.
a) MALT b) Spleen
c) Lymph node d) All of these
- iv) The MHC in mouse called H2 gene complex is located on chromosome no. _____ in mice.
a) 16 b) 6 c) 14 d) 17



- v) Bacteria, neoplastic cells, virus infected cells as well as intracellular parasites containing cells are destroyed by
- a) T lymphocytes
 - b) NK cells
 - c) B lymphocytes
 - d) Phagocytes
- vi) Cell mediated immunity protects the body from _____ pathogenic agents.
- a) Intracellular
 - b) Extracellular
 - c) Both a) and b)
 - d) None of these
- vii) The major histocompatibility complex proteins function to _____
- a) degrade T4 and T8 polypeptide
 - b) bind antibody for lymphokine production
 - c) bind complement for cell lysis
 - d) bind antigen fragments for presentation to T-cells
- viii) In an autoimmune myasthenia gravis autoantibodies are produced against _____
- a) RBC
 - b) WBC
 - c) Thyroid hormones
 - d) Acetyl choline receptors
- ix) An antibody response to foreign tissue is suppressed in which of the following phenomenon ?
- a) immune tolerance
 - b) immune enhancement
 - c) autoimmunity
 - d) none of these
- x) Activated B lymphocyte after antigenic stimulus get differentiated into _____
- a) Plasma and memory cells
 - b) Plasma and CD4 cells
 - c) NK cells and plasma cells
 - d) NK cells and memory cells
- xi) In an autoimmune disease idiopathic thrombocytopenic purpura autoantibodies are produced against
- a) RBC
 - b) WBC
 - c) Thyroid hormones
 - d) Platelets
- xii) T-suppressor cell carry _____ molecules on its surface.
- a) CD3
 - b) CD9
 - c) CD8
 - d) CD4



- xiii) Mast cell _____
 - a) release histamine
 - b) are phagocytic
 - c) circulate in the blood stream
 - d) are found in lymph nodes
- xiv) Bacteria, neoplastic cells, virus infected cells as well as intracellular parasites containing cells are destroyed by _____
 - a) T lymphocytes
 - b) NK cells
 - c) B lymphocytes
 - d) phagocytes

PART – II

Attempt **any four** questions.

- 2. Write in detail on “Diagnosis of Systemic Lupus Erythematosis (SLE) and other autoimmune diseases by Anti Nuclear Antibody (ANA) test”. 14
 - 3. Write in detail on “Structure and function of MHC gene complex in human and mouse”. 14
 - 4. Write essay on “Lymphoid organs”. 14
 - 5. Write in short on **any two** of the following : 14
 - a) HLA typing
 - b) Innate immunity
 - c) Chemokines.
 - 6. Write short notes on **any two** of the following : 14
 - a) T lymphocyte sub population
 - b) Differentiate between normal and cancer cell
 - c) Macrophage.
-



Seat No.	
-------------	--

**M.Sc. – II (Semester – IV) (CGPA) Examination, 2016
MICROBIOLOGY (Paper – XIV)
Bioinformatics and Biometry**

Day and Date : Friday, 1-4-2016

Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

- Instructions :** 1) *Part – I, Question 1 is compulsory.*
2) *Attempt **any four** questions from Part – II.*
3) *Figures to **right** indicate **full** marks.*
4) *Answers to Part – I and Part – II are to be written in **same** answer booklet **only**.*

PART – I

1. Rewrite the sentences after choosing correct answer from the given alternatives : **14**
- i) Which of the following is not a potential use for results of DNA microarray testing ?
 - a) Determining the probability that your offspring will carry the gene for a particular trait
 - b) Determining which genes are active in cells affected with cancer
 - c) Determining whether a particular drug will be toxic for you
 - d) All of the above are potential uses of DNA microarray testing
 - ii) Which of the following is a sequence alignment tool provided by NCBI ?
 - a) Chime b) BLAST c) FASTA d) Clustal W
 - iii) Sequence alignment helps scientists
 - a) To trace out evolutionary relationships
 - b) To infer the functions of newly synthesised genes
 - c) To predict new members of gene families
 - d) All of these



- xiii) Proteomics is a study of
 - a) Set of proteins
 - b) Set of proteins in specific region of the cell
 - c) Entire set of expressed proteins in a cell
 - d) None of these
- xiv) Application of bioinformatics include
 - a) Data store and management
 - b) Drug designing
 - c) Understand relationship between organisms
 - d) All of these

PART – II

Answer **any four** of Part – II

- 2. Write an essay on “Functional genomics”. 14
 - 3. Write an essay on : National Centre for Biotechnology Information (NCBI). 14
 - 4. Give an account of “Use of Bioinformatics in major research areas”. 14
 - 5. Write short answer of **any two** from the following : 14
 - a) Hypothesis and its testing
 - b) Practical application of proteomics
 - c) Microarray and bioinformatics.
 - 6. Write short notes on (**any two**) : 14
 - a) Application of statistics in life sciences
 - b) Metagenomics and epigenomics
 - c) Correlation and regression.
-



PART – II

Attempt **any four** questions :

2. Write an essay on 'Eutrophication. **14**
 3. Discuss in detail critical operating parameters in Industrial waste treatment. **14**
 4. Write in detail novel methods for pollution control with reference to vermicomposting and Root zone process. **14**
 5. Write short answer (**any two**) : **14**
 - a) BOD and COD.
 - b) Characteristics of paper and pulp industry waste water.
 - c) Enzymes and pollution.
 6. Write short notes on (**any two**) : **14**
 - a) Genetically Engineered microorganisms preservation and applications.
 - b) Global warming and acid rain.
 - c) Bioaugmentation.
-



- v) _____ is common nitrogen fixer in paddy fields.
- a) Rhizobium
 - b) Azospirillum
 - c) Azotobacter
 - d) Nitrobacter
- vi) Air and water together accounts for approximately _____ % of the soil volume.
- a) 10
 - b) 20
 - c) 30
 - d) 50
- vii) _____ are mutualistic symbiotic association between fungi and plant roots.
- a) Root nodules
 - b) Cysts
 - c) Mycorrhizae
 - d) Tumor
- viii) Gray color of soil is due to presence of _____
- a) Quartz and reduced iron compounds
 - b) Iron sulphides
 - c) Hydrated iron oxide
 - d) Carbonates and Quartz
- ix) 'Cry' protein is activated by _____ enzyme in the midgut of susceptible larvae.
- a) Lipase
 - b) Amylase
 - c) Protease
 - d) Ligase
- x) _____ enhances ability of plants to resist diseases.
- a) Chlorine
 - b) Molybdenum
 - c) Potassium
 - d) Na
- xi) Nitrogen fixation in root nodules of *Alnus* is brought about by _____
- a) Azotobacter
 - b) Nitrobacter
 - c) Clostridia
 - d) Frankia
- xii) C : N ratio for microbial decomposition of organic matter is roughly _____
- a) 30 : 1
 - b) 10 : 1
 - c) 1 : 20
 - d) 1 : 10



- xiii) _____ horizon contains more organic matter.
- a) O
 - b) A
 - c) B
 - d) C
- xiv) The rate at which water moves through the soil is called water _____
- a) Holding capacity
 - b) Permeability
 - c) Porosity
 - d) Conservation

PART – II

- 2. Write an essay on Biopesticides. 14
 - 3. Write an essay on production of Biofertilizers. 14
 - 4. Describe in detail Nitrogen cycle. 14
 - 5. Describe **any two** of the following : 14
 - a) Plant tissue culture.
 - b) Chemical composition of soil.
 - c) Root nodulation.
 - 6. Describe **any two** of the following : 14
 - a) Green manure.
 - b) Soil microorganisms.
 - c) Composting.
-