

Master of Science – I (Microbiology) Examination: October 2016
Semester – I (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SO-609	Wednesday 16/11/2016	10.30 AM to 01.00 PM	Cytology and Taxonomy of Microorganisms	HCT 1.1	

- Instructions:**
- 1) Q.1, 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.

Total Marks:70

PART I

Q.1 Rewrite the following sentences by selecting correct answers from given alternative. 14

- 1) Cell wall of halophilic organisms contains more amounts of _____ amino acids.
a) aromatic
b) acidic
c) basic
d) aliphatic
- 2) The fungal part of lichens generally belongs to _____.
a) Phycomycetes
b) Ascomycetes
c) Basidiomycetes
d) Fungi imperfecti
- 3) Pili are generally observed in Gram negative bacteria with exception of _____.
a) Corynebacterium renale
b) B. Subtilis
c) S. aureus
d) Str. faecalis
- 4) Capsule mainly composed by _____.
a) Lipids
b) Proteins
c) Polysaccharides
d) Fatty acids
- 5) _____ does not contain cell wall.
a) Mycoplasma
b) Bacteria
c) Algae
d) Protozoa
- 6) _____ is spore producing organism.
a) Clostridium
b) E. coli
c) Proteus
d) Pseudomonas
- 7) Electrophoretic mobility of bacteria becomes maximum and fairly constant when population enters in _____ phase.
a) lag
b) Death
c) exponential
d) Maximum stationary
- 8) Bacteria are considered more plants than animals because of presence of _____.
a) Nucleus
b) Cell membrane
c) Spore
d) Cell wall
- 9) An example of agrophyte is _____.
a) Dictyota
b) Nostoc
c) Gelidium
d) Fungus
- 10) The term Actinomycetes was coined by _____.
a) Pasteur
b) Waksman
c) Harz
d) Lederberg

- 11) _____ is basic taxonomic rank.
a) Species b) Genus
c) Class d) Family
- 12) _____ bacteria have one flagellum at one end.
a) Amphitrichous b) Peritrichous
c) Lophotrichous d) Monotrichous
- 13) Teichoic acid is only present in _____ bacteria.
a) Gram -ve b) Gram +ve
c) L – forms d) Mycoplasma
- 14) Rickettsias shows characters of both bacteria and _____.
a) Algae b) Fungi
c) Viruses d) Protozoa

PART II

- Q.2** Describe the general characteristics and classification of Actinomycetes. **14**
- Q.3** Write an essay on Bacterial flagella. **14**
- Q.4** Describe in detail classification and structure of fungi. **14**
- Q.5 Attempt any two of the following:** **14**
- a) Structure of Gram +ve cell wall
 - b) Classification of Procaryotic organisms
 - c) Cell membrane
- Q.6 Attempt any two of the following:** **14**
- a) Classification and structure of algae
 - b) Cell division and differentiation in Bacillus
 - c) Life cycle and mode of transmission of Chlamydia

**Master of Science – I (Microbiology) Examination: Oct / Nov 2016
Semester – I (New CBCS)**

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SO 610	Friday 18/11/2016	10:30 AM to 01:00 PM	Microbial Chemistry and Enzymology	HCT 1.2	

- Instructions:**
- 1) 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 labeled diagrams wherever necessary.

Total Marks: 70

PART I

Q.1 Rewrite the following sentences by selecting correct answers from given alternative. 14

- 1) _____ is example of multienzyme complex.
 - a) oxidase
 - b) amylase
 - c) lyase
 - d) Pyruvate dehydrogenase

- 2) The term protein was first proposed by _____.
 - a) Pasteur
 - b) Bergeys
 - c) Berzelius
 - d) Jacob

- 3) Cytochromes are conjugated proteins consisting _____ as prosthetic group.
 - a) SO₄
 - b) PO₄
 - c) Iron
 - d) CO₃

- 4) Starch contains amylase and amylopectin in _____ proportion.
 - a) 1:3
 - b) 1:4
 - c) 1:1
 - d) 1:2

- 5) Vitamin 'C' is called _____.
 - a) Folic acid
 - b) Calciferol
 - c) thiamine
 - d) ascorbic acid

- 6) Two sugars differ in the configuration around one specific carbon are called _____.
 - a) epimers
 - b) isomers
 - c) isotopes
 - d) epitopes

- 7) _____ carbon atom is present next to amino group in protein.
 - a) r
 - b) ω
 - c) β
 - d) α

- 8) Secondary structure of protein do not contain _____.
 - a) turns
 - b) α- helix
 - c) ω helix
 - d) disulphide bridges

- 9) _____ is monosaccharide.
 - a) glucose
 - b) maltose
 - c) lactose
 - d) sucrose

- 10) Glycerol combines with three fatty acid to form simple lipid called _____.
 a) trimeric
 b) trienoic
 c) triglyceride
 d) glyceride
- 11) Maltose is made up of _____.
 a) D-glucose and D-galactose
 b) D-glucose and D-glucose
 c) D-glucose and L-lactose
 d) D-glucose and L-galactose
- 12) Heme is made up of iron and organic pigment called _____.
 a) Photoporphyrin
 b) Protoporphyrin
 c) Photophosphoporphyrin
 d) Protophosphoporphyrin
- 13) _____ are fatty acid derivatives having hormonal or regulatory activity.
 a) Phospholipids
 b) Phosphoric acids
 c) Porphyrins
 d) Prostaglandins
- 14) Proline is _____.
 a) Spermine
 b) aliphatic amino acid
 c) aromatic amino acid
 d) iminoacid

PART II

- Q.2** Give brief account of structural features and classification of amino acids. **14**
- Q.3** Write an essay on nomenclature and classification of enzymes. **14**
- Q.4** Write in detail on factors enhancing catalytic efficiency of enzymes. **14**
- Q.5 Write short answers any two:** **14**
 a) Fat soluble vitamins
 b) Ramchandran Plot
 c) Chlorophyll II and Cytochromes
- Q.6 Write short answers any two:** **14**
 a) Covalent catalysis
 b) Pyruvate dehydrogenase
 c) Specificity of enzymes

**Master of Science – I (Microbiology) Examination: Oct / Nov 2016
Semester – I (New CBCS)**

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SO – 611	Monday 21/11/2016	10.30 AM to 01.00 PM	Recent Trends in Virology	HCT 1.3	

Instructions 1) Q.1, 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.
Total Marks: 70

PART I

Q.1 Rewrite the following sentences by selecting correct answers from given alternative. 14

- 1) _____ are the only viruses that produce genome DNA by reverse transcription with mRNA as the template.
 - a) Hepadnaviruses
 - b) Retroviruses
 - c) Influenza viruses
 - d) SARS viruses

- 2) _____ virus is defective virus?
 - a) Influenza
 - b) SARS
 - c) Marburg
 - d) Hepatitis D

- 3) _____ virus is also known as enterovirus 71?
 - a) Hepatitis A
 - b) Hepatitis E
 - c) Polio
 - d) Rota

- 4) For safety reasons, _____ is the least likely vaccine against HIV?
 - a) Purified Pol polyprotein
 - b) Purified Gag polyprotein
 - c) Attenuated virus
 - d) The capsid proteins

- 5) NPV means _____ which causes infection to insect.
 - a) Nuclear polyhedrosis virus
 - b) Neutral prismatic virus
 - c) Nonpermissive virus
 - d) All of these

- 6) Attenuate virus vaccines is too dangerous for some viral diseases because _____
 - a) Attenuated vaccines would induce only humoral immunity in the patient receiving them.
 - b) Because the virus is attenuated, the patient's immune system would not generate an immune response against it.
 - c) The attenuated virus might mutate as it is replicating in the patient and revert back to its virulent form.
 - d) An attenuated vaccine may not generate protective immunity because only a portion of the viral genome is used.

- 7) In Hepatitis C virus _____ is genome.
 - a) RNA
 - b) ssDNA
 - c) ds DNA
 - d) Semented RNA

- 8) Common recurrent disease produced by Herpes virus type 1 is _____
 - a) neonatal
 - b) cold sores
 - c) eczema herpeticum
 - d) genital Encephalitis

- 9) If an adult patient has fever, sore throat, and lymphadenopathy accompanied by lymphocytosis with atypical cells the diagnosis most likely is _____
- a) measles
b) infectious mononucleosis
c) infectious hepatitis
d) viral meningitis
- 10) Generally the incubation period of influenza is _____
- a) 1 to 2 days
b) 10 to 15 days
c) 14 to 20 days
d) 20 to 30 days
- 11) The measles virus _____
- a) elutes spontaneously from agglutinated cells
b) has many antigenic types
c) is highly contagious for only humans
d) contains neuraminidase molecules
- 12) Concerning the pathogenesis of influenza _____
- a) the virus enters the host in airborne droplets
b) pneumonia is not always associated with secondary bacterial invaders
c) necrosis of the upper respiratory tract is common
d) viremia is not present in the nasopharynx before the onset of the symptoms
- 13) Which of the following describe cytomegalovirus?
- a) It is a member of the herpes viruses
b) It is known to be the most common cause of congenital viral infection
c) transmission from mother to child can be in-utero, perinatally or through breast feeding
d) All of above
- 14) SARS disease means _____
- a) Severe acute respiratory syndrome
b) Severe acquired respiratory syndrome
c) Severe associated respiratory syndrome
d) Slowly acquired respiratory syndrome

PART II

- Q.2** Write in detail on structure, genomic organization, pathogenesis and control of orthomyxovirus virus. 14
- Q.3** Explain in detail multiplication, pathogenesis and control of plant viruses. 14
- Q.4 Write short answers (any two):** 14
- a) Describe in detail structure, genomic organization and reproduction of λ phage
b) Briefly describe $\phi X-174$ bacteriophages.
c) Prions
- Q.5 Write short answers (any two):** 14
- a) Draw labeled diagram of the HIV and add a note on its pathogenesis and control.
b) Briefly describe Cataloging of the viruses.
c) Describe in detail morphogenetic pathway for production of T4bacteriophage.
- Q.6 Write short answers (any two):** 14
- a) Describe in detail viroids
b) Briefly describe Emerging viruses with example.
c) Describe in detail viral assay with reference to infectivity assay.

Master of Science – I (Microbiology) Examination: Oct / Nov 2016
Semester – I (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SO– 612	Wednesday 23/11/2016	10.30 AM to 01.00 PM	Microbiology Techniques and Scientific Writing	SCT 1.1	

- Instructions:**
- 1) Q.1, Part I is compulsory.
 - 2) Attempt any four 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.

Total Marks: 70

PART I

Q.1 Rewrite the sentence by choosing correct alternative from the following **14**

- 1) _____ is a type of planar chromatography
 - a) Gas Liquid chromatography
 - b) Affinity Chromatography
 - c) Thin Layer Chromatography
 - d) HPLC

- 2) Which of the following is used as binding agent in TLC _____
 - a) Calcium Chloride
 - b) Calcium Sulfate
 - c) Cobalt Chloride
 - d) Magnesium Chloride

- 3) Ion exchange chromatography is base on _____
 - a) Partition
 - b) Absorption
 - c) Electrostatic attraction
 - d) Electrical mobility

- 4) In SDS – PAGE, separation is based on _____
 - a) Size
 - b) Shape
 - c) Molecular weight
 - d) Density

- 5) Which gel is commonly used for the separation of DNA molecules _____
 - a) Agar
 - b) Poly Acrylamide
 - c) Agarose
 - d) Ethidium bromide

- 6) Electrophoresis technique for the separation of charged molecules was developed by _____
 - a) Tiselius
 - b) Tswett
 - c) Ramachandran
 - d) Sangar

- 7) Which of the following is true for an anion _____
 - a) Negatively charged ion that moves towards anode
 - b) Positively charged ion that moves towards anode
 - c) Negatively charged ion that moves towards cathode
 - d) Positively charged ion that moves towards cathode

- 8) Which of the following is used to visualize electrophoresed molecules _____
 - a) Silver staining
 - b) Ethidium bromide
 - c) CBB – R
 - d) All of the above

- 9) Diethylaminoethyl cellulose (DEAE – Cellulose) is an example of _____
a) Anion exchanger
b) Cation Exchanger
c) Both a) & b)
d) None of the above
- 10) Electrophoretic mobility is affected by _____
a) Shape of molecule
b) Size of molecule
c) Charge on the molecule
d) All of the above
- 11) While preparing manuscript, Materials & Methods section should be presented in _____
a) Present Tense
b) Past Tense
c) Future Tense
d) None of these
- 12) In scientific writing, ideally length of the sentences should be _____
a) 5 – 10 words
b) 12 -15 words
c) 35 – 40 words
d) 30 – 35 words
- 13) Most commonly used fontface in slides for oral presentation is _____
a) Time New Roman
b) Helvetica
c) Aerial
d) Courier New
- 14) DOI stands for _____
a) Digital Office Index
b) Digital Object Identifier
c) Date of Issue
d) None of these

PART II

Answer any four questions from the following

- Q.2** Explain in detail Ion-Exchange Chromatography **14**
- Q.3** What do you mean by scientific Writing? Describe IMRAD system of scientific writing. **14**
- Q.4** Explain in detail principle and working of HPLC **14**
- Q.5** **Write short answers (any two):** **14**
a) Draw ray diagram of the Electron Microscope and add a note on working of SEM
b) Poster presentation
c) Importance and significance of documentation in microbiological laboratory.
- Q.6** **Write short note on any two** **14**
a) Thin layer chromatography
b) Iso – electric focusing
c) Density gradient centrifugation

**Master of Science – I (Microbiology) Examination: Oct/ Nov 2016
Semester – I (Old CBCS)**

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SO 615	Friday 18/11/2016	10:30 AM to 01:00 PM	Microbiological Techniques & Scientific Writing	II	

- Instructions:**
- 1) Q.1, 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.

PART I

Q.1 Rewrite the following sentences by selecting correct answers from given alternative. 14

- 1) An introduction of scientific paper is written in _____ tense.
a) Present b) Past
c) Future d) all of the above

- 2) The most common dye used to make DNA or RNA bands visible for agarose gel electrophoresis is _____
a) Acridine orange b) Proflavin
c) Bromothymol blue d) Eethidium bromide

- 3) The most suitable gas to use as a carrier gas in a gas chromatogram is _____
a) Methane b) Oxygen
c) Helium d) Oxygen

- 4) _____ is a brief summary of the information in a research document.
a) Review b) Objectives
c) Abstract d) Conclusion

- 5) High performance liquid chromatography (HPLC) cannot be used to _____
a) Separate different types of organic pesticides.
b) Identify the various pigments from a leaf extract.
c) Determine the caffeine content of coffee samples.
d) Determine the mercury content of a fish sample.

- 6) Any significant technical help received from any individual, source of special equipment, cultures or other materials is acknowledged in _____
a) Abstract b) Acknowledgement
c) Results d) Materials and Methods

- 7) The principle of osmotic pressure is used in the _____
a) reverse osmosis b) gel filtration
c) electroendoosmosis d) nanofiltration

- 8) Gradients of caesium salts are used for separation of _____
a) nucleic acids b) enzymes
c) proteins d) cell organells

- 9) Transmission electron microscopy is best for high magnification viewing of _____
- internal structure of live, motile cells
 - internal structure of fixed cells
 - surface structure of fixed cells
 - surface membranes of live, motile cells
- 10) _____ presents the previously published facts and theories in a particular field.
- The result and discussion
 - An abstract
 - The material and method
 - A review paper
- 11) Pulse field gel electrophoresis is used to separate _____
- lipids
 - Immunoglobulins
 - large DNA molecules
 - small DNA molecules
- 12) _____ type of column chromatography separates proteins on the basis of molecular weight.
- gel filtration chromatography
 - ion-exchange chromatography
 - affinity chromatography
 - isoelectric focusing
- 13) An abstract of research paper should not exceed _____ words.
- 500
 - 250
 - 100
 - 50
- 14) _____ makes the content of book easily accessible to its readers.
- An index
 - A table
 - Introduction
 - References

PART II

- Q.2** Discuss the principle, materials used and applications of ultra filtration. **14**
- Q.3** Describe principle and method of agarose gel electrophoresis of nucleic acids. **14**
- Q.4** Explain principle, instrumentation, materials and applications of High Performance Liquid Chromatography. **14**
- Q.5 Write short answers (any two):** **14**
- Explain the guidelines for writing a research paper.
 - Staining of specimens for electron microscopy.
 - Write on principle and applications of TLC.
- Q.6 Write short answers (any two):** **14**
- Give the guidelines for preparation and submission of proposals to the funding agencies.
 - Techniques for Enrichment and isolation of algae
 - Discuss RNA electrophoresis

**Master of Science – I (Microbiology) Examination: Oct / Nov 2016
Semester – I (Old CBCS)**

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SO - 616	Monday 21/11/2016	10.30 AM to 01.00 PM	Recent Trends in Virology	III	

- Instructions**
- 1) 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) Figures to the right indicate full marks.

Total Marks: 70

PART I

Q.1 Rewrite the following sentences by selecting correct answers from given alternative. 14

- 1) 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

- 2) Human body produces _____ as antiviral substance.
 - a) Antibody
 - b) Antigen
 - c) Interferon
 - d) Immunogen

- 3) LHT system of viral classification grouped DNA viruses into _____ class.
 - a) Retroviruses
 - b) Retroviridae
 - c) Ribovira
 - d) Deoxyvira

- 4) _____ is temperate phage.
 - a) λ
 - b) T4
 - c) T3
 - d) θ X174

- 5) Yolk sac is useful for cultivation of _____ virus.
 - a) TMV
 - b) Rabies
 - c) Herpes simplex
 - d) Plant

- 6) In lambda phage _____ gene is responsible for the lysogenic state.
 - a) Q
 - b) A
 - c) R
 - d) C1

- 7) One step Growth Experiment was devised by _____.
 - a) Watson
 - b) Crick
 - c) Lederberg
 - d) Delbruck

- 8) Lipid bilayer membrane of poxviruses is originated from _____ host cell.
 - a) Plasma membrane
 - b) Nuclear membrane
 - c) Endoplasmic Reticulum
 - d) Golgi Apparatus

- 9) Viroids were discovered by _____
a) Diener
b) Puschner
c) Boin
d) Baltimore
- 10) The name of Order in ICTV system always ends with suffix _____
a) Viridae
b) Virales
c) Vira
d) Viraceae
- 11) Rabies virus is _____ shaped.
a) Icosahedral
b) Helical
c) Spherical
d) Bullet
- 12) _____ lacks protective capsid around the nucleic acids.
a) Slow viruses
b) Viroids
c) Prions
d) Naked Viruses
- 13) _____ virus can undergo antigenic shift.
a) Rabies
b) Hepatitis
c) Influenza
d) Pox
- 14) Hubner and Todaro proposed _____ theory.
a) Provirus
b) Proto virus
c) Oncogene
d) Somatic mutation

PART II

- Q.2** Describe in detail Cultivation of viruses using embryonated eggs and cell cultures. **14**
- Q.3** Discuss in detail Control of viral infections with vaccines and chemotherapeutic agents. **14**
- Q.4 Write short answers any two: 14**
a) Describe briefly reproduction of DNA and RNA bacteriophages.
b) Discuss briefly Host cell transformation by viruses.
c) Describe briefly multiplication of Adeno viruses.
- Q.5 Write short answers any two: 14**
a) Describe briefly emerging viral infections.
b) Discuss briefly Assay of infectivity.
c) Draw labeled diagram of the influenza virus and add a note on antigenic shift and antigenic drift.
- Q.6 Write short answers any two: 14**
a) Satellite viruses
b) Discovery of viruses
c) ICTV

**Master of Science – I (Microbiology) Examination: Oct / Nov 2016
Semester – I (Old CBCS)**

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SO - 617	Wednesday 23/11/2016	10.30 AM to 01.00 PM	Microbial Chemistry and Enzymology	IV	

- Instructions:**
- 1) 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) Figures to the right indicate full marks.

Total Marks: 70

PART I

Q.1 Rewrite the following sentences by selecting correct answers from given alternative. 14

- 1) _____ amino acid has negatively charged R group.

a) alanine	b) Tryptophan
c) glutaric acid	d) tyrosine

- 2) Night blindness is due to deficiency of _____.

a) Vit C	b) Vit D
c) Vit A	d) Vit B2

- 3) _____ are fatty acid derivatives having hormonal or regulatory activity.

a) Steroids	b) Prostaglandins
c) Glycerides	d) Cholesterol

- 4) Zwitter ions are _____ in nature.

a) acidic	b) basic
c) Neutral	d) Positive

- 5) _____ is not globular protein.

a) haemoglobin	b) Pancreatic amylase
c) Ovalbumin	d) Collagen

- 6) Non protein inorganic part of enzyme is called _____.

a) coenzyme	b) apoenzyme
c) cofactor	d) holoenzyme

- 7) Cyclo pentanoperhydro phenanthrene ring system is present in _____.

a) Vitamin B1	b) Vitamin B12
c) Vitamin K	d) Vitamin D

- 8) Haemoglobin contains _____ haem groups.

a) 2	b) 4
c) 6	d) 8

- 9) _____ is an allosteric enzyme.

a) Lactate dehydrogenase	b) Alcohol dehydrogenase
c) Aspartate transcarbamylase	d) ATPase

10) Two sugars of different configuration around one specific carbon are called

- a) isomers
- b) epimers
- c) isotopes
- d) epitopes

11) _____ is sulfur containing amino acid.

- a) Proline
- b) Valine
- c) alanine
- d) cystein

12) Allosteric enzymes are regulated by _____ model.

- a) Symetry
- b) Synchronous
- c) Systemic
- d) non synchronous

13) _____ is an example of multienzyme.

- a) β galactosidase
- b) Pyruvate dehydrogenase
- c) Galactoside Permease
- d) Aspartate transcarbonylase

14) Starch is a mixture of _____ & _____.

- a) Glucose & galactose
- b) Amylase & amylopectin
- c) Lactose & glucose
- d) Xylose & glucose

PART II

Q.2 Explain in detail Briggs & Halden modification. **14**

Q.3 Describe types of fatty acids & their nomenclature. **14**

Q.4 Explain in detail fat soluble vitamins and their significance. **14**

Q.5 Write short answers any two: **14**

- a) Lineweaver burk plot
- b) Explain functions of chymotrypsin & lysozyme
- c) Chemistry & Porphyrins & chlorophylls

Q.6 Write short answers any two: **14**

- a) Role of metal ions in enzyme function
- b) Explain Ogston's experiment
- c) Monomeric & Oligomeric enzymes

Master of Science – I (Microbiology) Examination: Oct / Nov 2016
Semester – II (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SO – 618	Thursday 17/11/2016	10.30 AM to 01.00 PM	Microbial Genetics	V	

- Instructions**
- 1) Part I, Q.1 is compulsory.
 - 2) Attempt any four questions from Part II.
 - 3) Part I and Part II should be written in same answer book.
 - 4) Figures to the right indicate full marks.

PART I

Q.1 Rewrite the following sentences by selecting correct answers from given alternative. 14

- 1) The exact point where nucleotides are being added to growing daughter strands during DNA replication are called as _____
 - a) the origin
 - b) the double helix
 - c) the template
 - d) the replication fork

- 2) During transcription newly synthesized RNA forms base pairing with coding sequence _____
 - a) for short distance
 - b) for whole length
 - c) for no length
 - d) half length

- 3) Translation and transcription is generally coupled in _____
 - a) Bacteria
 - b) Viruses
 - c) Plants
 - d) Animals

- 4) Model for replicative transposition was proposed by _____
 - a) McClintock
 - b) Shapiro
 - c) Luria
 - d) Dupra

- 5) Sometimes you can see mRNA molecules growing in both directions of dsDNA of bacterial chromosome; it is due to fact that _____
 - a) RNA polymerase can work in both directions
 - b) Opposite strands of a DNA sequence code always for two different genes
 - c) genes can be transcribed from opposite strands
 - d) None

- 6) Biomolecules first arose by _____
 - a) genetic evolution
 - b) chemical evolution
 - c) biological evolution
 - d) randomly

- 7) In PCR _____ DNA polymerase is used.
 - a) Type II
 - b) Type IV
 - c) Type III
 - d) Type I

Master of Science – I (Microbiology) Examination: Oct / Nov 2016
Semester – II (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SO – 619	Saturday 19/11/2016	10:30 A.M to 01:30 P.M	Microbial Physiology & Metabolism	VI	

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

Total Marks:70

PART I

Q.1 Rewrite the following sentences by selecting correct answers from given alternative. 14

- 1) Cytochromes are _____ in the respiratory chain.
a) Polymerizing enzymes b) Hydrolyzing enzymes
c) Oxidative enzymes d) Reductive enzymes
- 2) _____ enzyme involved in conversion of nucleosides to nucleotides.
a) Nucleotide oxidase b) Nucleotide Kinase
c) Nucleotide reductase d) Nucleotide transferase
- 3) Mitochondrial ETC is _____
a) Linear b) Branched
c) Three dimensional d) Two dimensional
- 4) Cytochromes are conjugated proteins consisting _____ as prosthetic group.
a) Iron b) SO_4
c) PO_4 d) CO_3
- 5) Phosphotransferase also regulate _____ enzyme.
a) adenylate oxidase b) adenylate cyclease
c) adenylate kinase d) adenylate reductase
- 6) _____ can takes place across the concentration gradient and requires energy.
a) Simple diffusion b) Passive diffusion
c) Facilitated diffusion d) Translocation
- 7) In biosynthesis of saturated fatty acids, the basic adding unit is _____
a) Acetyl CoA b) Adenylate CoA
c) Citryl CoA d) Malonyl CoA
- 8) A revolving door model of active transport has been proposed to explain the passage of _____ through cell membrane.
a) Lactose b) Glucose
c) Maltose d) Galactose

- 9) _____ show similarities with the probable ancestor of mitochondria.
- Diplococcus
 - Micrococcus
 - Paracoccus
 - Mixococcus
- 10) Phosphate moles taken up for NAD linked ETC are _____
- 1
 - 2
 - 3
 - 4
- 11) Omega oxidation of hydrocarbons leads to formation of _____ acids.
- Dicarboxyl
 - Tricarboxyl
 - Monocarboxyl
 - Polycarboxyl
- 12) _____ is ultimate source of all carbon atoms of fatty acids.
- Citryl CoA
 - Acetyl CoA
 - Succinyl CoA
 - Formyl CoA
- 13) Osmosis is flow of solvent from region of _____ solute con
- Low to high
 - Low to low
 - High to high
 - High to low
- 14) Bacteria can communicate by releasing and detecting _____ to gauge their population density.
- Pigments
 - Organic acids
 - Enzymes
 - Pheromones

PART II

- Q.2** Write an essay on transport mechanisms. **14**
- Q.3** Write in detail on De novo synthesis of purines. **14**
- Q.4** Give an account of citric acid cycle. **14**
- Q.5 Write short answers any two:** **14**
- Microbial hormones and their significance
 - Theories of ATP generation
 - Aerobic and anaerobic ETC
- Q.6 Write short answers any two:** **14**
- Alpha oxidation of hydrocarbons
 - Components of ETC
 - Oxygen toxicity

Master of Science – II (Microbiology) Examination: Oct / Nov 2016
Semester – II (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – S0 - 620	Tuesday 22/11/2016	10.30 AM To 01.00 PM	Biophysics & Bioinstrumentation	VII	

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

Total Marks: 70

PART – 1

Q.1 Rewrite the sentences after choosing correct answers from the given alternative. 14

- 1) In UV-Visible spectrophotometer, % Transmittance = _____ I_T / I_0
 - a) 90
 - b) 80
 - c) 102
 - d) 100

- 2) In Mass Spectroscopy _____ detectors are used
 - a) Photomultiplier tube & photographic films
 - b) X-ray Films
 - c) Electron multiplier
 - d) Dielectric multiplier

- 3) For visible region _____ is used for reference clamber.
 - a) Pyrex glass
 - b) Quartz
 - c) Class of pure silicon dioxide
 - d) None

- 4) The isotopes of an element have the same number of _____ but different number of _____
 - a) proton, electron
 - b) proton, neutrons
 - c) neutrons, electron
 - d) only proton

- 5) In spectroscopy, the visible regions of the spectrum extend between _____ & _____ colour.
 - a) violet, red
 - b) violet, green
 - c) orange, violet
 - d) red, blue

- 6) In most of the Atomic Absorption Spectrophotometer dispersive grating that have resolution in the range of _____ is used
 - a) 0.4-0.04 nm
 - b) 0.2-0.02nm
 - c) 0.2-0.3nm
 - d) 0.4-0.5nm

- 7) _____ technique is useful for preliminary examination of explosive materials such as nitrobenzene, TNT, RDX, HMX, Tetryl, etc
 - a) UV-Visible Spectrophotometer
 - b) Radio isotopic technique
 - c) Atomic Absorption Spectroscopy
 - d) Atomic emission Spectroscopy

- 8) _____ technique was first carried out for quantification of Insulin in diabetic patient.
- a) IR
b) RIA
c) ELISA
d) NMR
- 9) X-rays was discovered by _____ in 1895
- a) Rontgen
b) Neubaur
c) Henry Bequerel
d) None
- 10) _____ is a versatile, non-destructive analytical technique for identification and quantitative determination of the various crystalline forms.
- a) Circular Dichroism
b) Optical Rotary Dispersion Spectroscopy
c) Nuclear Magnetic Resonance
d) X-ray diffraction
- 11) _____ is defined as a piece of solid matter in which the atoms are regularly arranged in space.
- a) Crystal
b) Phase
c) Crystalloids
d) None
- 12) In X-ray spectroscopy _____ crystallites give rise to sharp peaks.
- a) Small
b) Large
c) Very small
d) Very large
- 13) The ‘Fingerprint Region’ is related to _____ spectroscopy
- a) Infra-Red
b) X-ray
c) Raman
d) Nuclear magnetic
- 14) _____ technique is useful to determine the molecular weight at the expense of negligible amount of sample.
- a) Mass spectroscopy
b) IR spectroscopy
c) Raman Spectroscopy
d) X-ray diffraction

PART – II

- Q.2** Write an essay on “Autoradiography” **14**
- Q.3** Write in detail about “Nuclear Magnetic Resonance” **14**
- Q.4** Describe in detail the technique and applications of atomic absorption spectroscopy **14**
- Q.5** **Write a short answers (any two)** **14**
- A) Discuss briefly the “Raman Spectroscopy”
B) Give brief account of “Potentiometry”.
C) Describe in brief “voltametry”
- Q.6** **Write short answers (any two)** **14**
- A) Discuss briefly “Immunodiffusion”
B) Briefly describe “Nanometry”
C) Describe in detail “General principle and applications of electromagnetic radiation”

Master of Science – I (Microbiology) Examination: Oct / Nov 2016
Semester – II (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SO - 621	Thursday 24/11/2016	10.30 AM to 01.00 PM	Microbial Ecology & Diversity	VIII	

- Instructions:**
- 1) **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) **Figures to the right indicate full marks.**

Total Marks: 70

PART I

Q.1 Rewrite the following sentences by selecting correct answers from given alternative. 14

- 1) The ecological niche of an organism is its _____.
a) Foraging area
b) Habitat
c) Territory
d) Way of life
- 2) An ecosystem refers to _____.
a) The part of earth and atmosphere capable of inhibiting the living organisms.
b) The biotic factors in a habitat.
c) The community of organisms together with the environment in which they live.
d) A community of organisms interacting with one another.
- 3) _____ represent the largest population in an ecosystem.
a) Producers
b) Top consumers
c) Decomposers
d) Consumers
- 4) The effect of pollution is mainly on _____.
a) Ecological balance
b) Cell division
c) Crop rotation
d) Mutation
- 5) Azotobacter is a _____.
a) Symbiotic biofertilizer
b) Terrestrial Saprophytic biofertilizer
c) Endotrophic fungus
d) Ectotrophic mycorrhiza
- 6) Parmelia is a common example of _____.
a) Fungi
b) Algae
c) Lichens
d) Bacteria
- 7) _____ is a free living heterotrophic N_2 fixer.
a) Rhizobium
b) Streptococcus
c) Clostridium
d) Azotobacter
- 8) _____ is absent in prokaryotic cell.
a) Mesosome
b) Mitochondria
c) Cell wall
d) Cytoplasmic membrane

Master of Science – II (Microbiology) Examination: Oct / Nov 2016
Semester – III (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SO – 631	Friday 18/11/2016	02:30 P.M to 05:00 P.M	Immunology & Immunotechnology	X	

- Instructions:**
- 1) 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) Figures to the right indicate full marks.

Total Marks: 70

PART I

Q.1 Rewrite the following sentences by selecting correct answers from given alternative. 14

- 1) Humoral Immunity is mediated by _____
 - a) B cells
 - b) macrophages
 - c) dendritic cells
 - d) cytotoxic T cells
- 2) _____ is secondary lymphoid organ.
 - a) MALT
 - b) Spleen
 - c) Lymph node
 - d) All of these
- 3) The MHC in mouse called H2 gene complex is located on chromosome no. _____ in mice.
 - a) 16
 - b) 6
 - c) 14
 - d) 17
- 4) 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
- 5) Cell mediated immunity protects the body from _____ pathogenic agents.
 - a) Intracellular
 - b) extracellular
 - c) both a and b
 - d) None of these
- 6) Generally antibodies produced against the pathogen are _____
 - a) Monoclonal
 - b) polyclonal
 - c) homogenous
 - d) a & b both
- 7) In an autoimmune Mastheniagravic autoantibodies are produced against _____
 - a) RBC
 - b) WBC
 - c) Thyroid hormones
 - d) acetyl choline receptors
- 8) 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
- 9) 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

- 10) In an autoimmune disease idiopathic thrombocytopenic purpura autoantibodies are produced against
- a) RBC
 - b) WBC
 - c) Thyroid hormones
 - d) platelets
- 11) MHC is present in _____
- a) only human
 - b) only mouse
 - c) human & mouse
 - d) all mammals
- 12) Cytokines are _____
- a) low molecular wt proteins
 - b) high molecular weight
 - c) both a and b
 - d) none of these
- 13) Histamine is _____
- a) Primary mediator of anaphylaxis
 - b) atopen
 - c) secondary mediator of anaphylaxis
 - d) allergen
- 14) Mast cell _____
- a) are found in lymph nodes
 - b) are phagocytic
 - c) circulate in the blood stream
 - d) Release histamine

PART II

Attempt any Four questions from Part II.

- Q.2** Write essay on “Primary and Secondary lymphoid organs”. **14**
- Q.3** Write in detail on “Structure and function of MHC gene complex in human and mouse”. **14**
- Q.4** Write in detail on “Diagnosis of SLE and other autoimmune diseases by Anti nuclear antibody (ANA) test”. **14**
- Q.5** **Write short answers any Two:** **14**
- a) Natural killer (NK) cells
 - b) Innate immunity
 - c) Chemokines
- Q.6** **Write short notes on any Four of the following:** **14**
- a) T lymphocyte and its types
 - b) Macrophage
 - c) Immunodiagnosis of tumors
 - d) HLA typing
 - e) Differentiate between normal and cancer cell
 - f) Alpha fetoprotein

**Master of Science – II (Microbiology) Examination: Oct / Nov 2016
Semester – III (New CBCS)**

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SO– 632	Monday 21/11/2016	02:30 P.M to 05:00 P.M	Bioprocess Technology and Fermentation Technology	XI	

- Instructions:**
- 1) **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) **Figures to the right indicate full marks.**

Total Marks:70

PART I

Q.1 Rewrite the following sentences by selecting correct answers from given alternative. 14

- 1) For industrial fermentations generally _____ media are used.
a) Pure
b) Synthetic
c) Crude
d) Selective
- 2) Leuconostocmesenteroids produces _____ acid in many Fermented Foods.
a) Acetic
b) Malic
c) Citric
d) Lactic
- 3) Agaricuscompestris mushroom is popularly called _____.
a) Food
b) Khumb
c) Protein
d) lipid
- 4) _____ is used as experimental animal for allergy testing.
a) Mice
b) Mosquito
c) Cat
d) Guinea pig
- 5) Distillation is used for recovery of _____.
a) Penicillin
b) Streptomycin
c) Vit B12
d) Alcohol
- 6) Assurance given by manufacturer is called _____.
a) Quality assurance
b) Guarantee
c) Expiry
d) Warranty
- 7) _____ is an example of dual fermentation.
a) Alcohol
b) Penicillin
c) Streptomycin
d) Vinegar
- 8) Heat labile liquid media are sterilized by _____.
a) Filtration
b) Autoclave
c) Chemicals
d) Drying

- 9) _____ is waste product of sugar industry.
 a) SWL b) CSL
 c) Whey d) Molasses
- 10) Crowded plate technique is used for primary screening of _____ producer.
 a) Antibiotic b) Vitamins
 c) Acid d) Alcohol
- 11) _____ is used for strain improvement.
 a) Sterilization b) Mutation
 c) Pasteurization d) Incubation
- 12) Stock culture is maintained by _____
 a) Lyophilization b) Tyndallization
 c) Incubation d) Sterilization
- 13) _____ is used for penicillin bioassay.
 a) E. coli b) Proteus
 c) S. aureas d) Shigella
- 14) Brandy is produced by distillation of _____
 a) Beer b) Vinegar
 c) Alcohol d) Wine

PART II

- Q.2** Describe in detail Mushroom production and its applications. **14**
- Q.3** Describe in detail design and operations of different bioreactors. **14**
- Q.4** Write an essay on Fermentation media. **14**
- Q.5 Write short answers any two:** **14**
 a) Automation in Fermentation Industry
 b) Streptomycin Fermentation
 c) Intellectual property rights
- Q.6 Write short answers any two:** **14**
 a) Amylase production
 b) Sterility testing
 c) Control of Metabolic pathways

Master of Science – II (Microbiology) Examination: Oct/Nov 2016
Semester – III (New CBCS)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – S0 – 633	Wednesday 23/11/2016	02.30 PM to 05.00 PM	Bioinformatics & Biometry	XII	

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

Total Marks: 70

PART – 1

Q.1 Rewrite the sentences by choosing correct alternatives from the following **14**

- 1) The fundamental statistical indicators are _____
 - a) Mean & standard deviation
 - b) Median
 - c) Variance
 - d) Mode
- 2) The median of a series of numerical values is _____
 - a) Equal to the average
 - b) A graph or hart
 - c) A number
 - d) A frequency table
- 3) _____ is a measure of central tendency which is least affected by extreme values
 - a) Mean
 - b) Mode
 - c) H.M
 - d) Median
- 4) The term used to refer something “performed on computer or computer simulation” is _____
 - a) Dry lab
 - b) Wet lab
 - c) In vitro
 - d) In silico
- 5) The alignment procedure that tries to align the entire sequence is _____
 - a) Multiple sequence alignment
 - b) Pair wise alignment
 - c) Global alignment
 - d) Local alignment
- 6) If a series of values consist of 21 numbers, then for finding the median, we ordered the series ascending and we use _____
 - a) The 11th value in the ordered series
 - b) The mean between the 10th and 11th values
 - c) The mean between the 11th and 12th values
 - d) The 10 th value in the ordered series
- 7) A clinical trial is more valuable when _____
 - a) Sensitivity and specificity have higher values
 - b) Sensitivity is higher than specificity
 - c) Specificity is higher than sensitivity
 - d) The sensitivity & specificity values are regardless of their values

- 8) The result of a statistical test, denoted p , shall be interpreted as follows:
- | | |
|---|---|
| a) The null hypothesis H_0 is rejected if $p < 0.05$ | b) The null hypothesis H_0 is rejected if $p > 0.05$ |
| c) The alternate hypothesis H_1 is rejected if $p > 0.05$ | d) The null hypothesis is H_0 is accepted if $p > 0.05$ |
- 9) Which of the following is a sequence alignment tool _____
- | | |
|------------|----------|
| a) BLAST | b) PRINT |
| c) PROSITE | d) PIR |
- 10) The comprehensive database for the study of human genetics and molecular biology is -
- | | |
|---------|---------|
| a) PDB | b) STAG |
| c) OMIM | d) PSD |
- 11) FlyBase is a _____
- | | |
|--------------------------|----------------------------|
| a) Biodiversity database | b) Model organism database |
| c) Literature database | d) Biomolecular database |
- 12) _____ is study of association between genome data and drug response platforms
- | | |
|----------------------|---------------------|
| a) Pharmainformatics | b) Pharmaproteomics |
| c) Pharmacogenomics | d) Pharmacopeia |
- 13) The database covered by Entrez for probeset is _____
- | | |
|----------------------------|--------------|
| a) Gene expression omnibus | b) Swis PROT |
| c) PubMed | d) DBCET |
- 14) Is the branching graph used to represent eg : phylogenetic relationships or the clustering of microarray data.
- | | |
|-------------------|---------------|
| a) Microdendogram | b) Cladogram |
| c) Phylogram | d) Dendrogram |

PART – II

- Q.2** Write in detail on standard deviation and give its applications with example. 14
- Q.3** What is phylogeny? Discuss various algorithms used in phylogenetic analysis. 14
- Q.4** Write a short note on any two of the following : 14
- | |
|---|
| A) Describe in detail large scale genome sequencing strategies. |
| B) Briefly describe pharmacogenomics. |
| C) Explain in detail descriptive statistics. |
- Q.5** Write short answers (any two) 14
- | |
|---|
| A) Application of bioinformatics and drug discovery. |
| B) Briefly describe multiple comparison test. |
| C) Describe in detail prediction of 3D protein structure. |
- Q.6** Write short notes on (any two) 14
- | |
|--|
| A) Describe in detail chi-square test. |
| B) Briefly describe frequency distribution with example. |
| C) Describe in detail Swiss PROT. |

**Master of Science – II (Microbiology) Examination: Oct / Nov 2016
Semester – III (New CBCS)**

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SO - 634	Wednesday 23/11/2016	02:30 PM To 05:00 PM	Skills in Scientific Writing	XII	

- 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

Total Marks:70

PART - I

Q.1 Rewrite the sentences after choosing correct answer from the given alternatives **14**

- 1) While writing Abstract section of a research paper _____ tense must be used.

a) Past	b) Present
c) Future	d) Any tense

- 2) The best search tool for review of literature today is _____.

a) Your guide	b) Library
c) Internet	d) Sending emails to scientists

- 3) Which of the following characteristics is NOT true for research
 - a) Research begins with problem
 - b) Research proposes a hypothesis as a possible answer to the problem
 - c) Research is accumulation of facts and transferring them to information
 - d) Research attempts to interpret facts and is cyclical

- 4) Approximately _____ of the world’s leading journals are indexed in MEDLINE of NCBI

a) 2000	b) 100
c) 150000	d) 5000

- 5) The term used to refer something “performed on computer or computer simulation”

a) Dry lab	b) Wet lab
c) In vitro	d) In Silico

- 6) “ All living things are made up of cells Blue whale is a living being Therefore blue whale is made up of cell” the reasoning used here is

a) Inductive	b) Deductive
c) Both a and b	d) Hypothetico –deductive

- 7) At the of research process
 - a) The hypothesis will always be approved
 - b) The hypothesis may be rejected
 - c) The hypothesis may be approved or rejected
 - d) All of these

- 8) The variable that the research changes or manipulates is called _____
 a) Control
 b) Dependent variable
 c) Independent variable
 d) Responding variable
- 9) When planning your literature search you need to _____
 a) Have clearly defined research questions and objectives
 b) Define the parameters of your search
 c) Generate key words and search terms
 d) All of these
- 10) What are the qualities of good hypothesis
 a) Deduction and induction
 b) Exploratory and deductive
 c) Dejection and injection
 d) None of these
- 11) A systematic, controlled, empirical and critical investigation of natural phenomenon guided by theory and hypothesis is called _____
 a) Applied research
 b) Basic research
 c) Scientific research
 d) None of these
- 12) All research process starts with _____
 e) Hypothesis
 f) Experiments to test hypothesis
 g) Observation
 h) All of these
- 13) To have internet facility you must have _____
 a) Modem
 b) Internet explorer
 c) Access to internet service provider
 d) All of these
- 14) Inductive method was first proposed by _____
 a) Francis Bacon
 b) Christian Huygenes
 c) Aristotle
 d) Issac Newton

PART – II

Attempt any Four questions from part II

- Q.2** Write in detail on “Use of Google/NCBI/PUBMED for searching literature” **14**
- Q.3** Write in detail on “How Will you prepare abstract and Introduction of the research paper?” **14**
- Q.4** Write essay on “Skills in scientific writing” **14**
- Q.5** **Write in short on any two of the following** **14**
 a) How to write Ph.D. thesis?
 b) What is guideline for authors?
 c) How to enrichment English vocabulary.
- Q.6** **Write short notes on any FOUR of the following** **14**
 a) Tools of research
 b) Need of sampling in research
 c) How will you prepare for poster presentation?
 d) Impact factor of the journal
 e) How will you prepare a title of the research paper?
 f) How to design effective graphs in the research paper?

Master of Science – II (Microbiology)
Examination: Oct / Nov 2016 Semester – IV (CGPA)

SLR No.	Day & Date	Time	Subject Name	Paper No.	Seat No.
SLR – SO – 637	Tuesday 22/11/2016	02.30 PM To 05.00 PM	Waste Management Technology	XV	

- Instructions:**
- 1) 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) Figures to the right indicate full marks.

Total Marks: 70

PART I

Q.1 Rewrite the following sentences by selecting correct answers from given alternative. 14

- 1) Earthworms are used in the process of _____ composting.
a) Vermi
b) Wormi
c) Night soil
d) Green manure
- 2) In anaerobic sludge digestion _____ gas is produced in large amount.
a) H_2
b) CO_2
c) CH_4
d) H_2S
- 3) _____ organism play important role in acceleration of eutrophication.
a) Fungi
b) Algae
c) Viruses
d) Protozoa
- 4) Generally paper and pulp industry waste water contains _____ % of liquin.
a) 10-20
b) 20-40
c) 50-60
d) 70-80
- 5) Generally in water tracing techniques _____ fluorescent dye in used.
a) Eo cin
b) Sudan Black - B
c) Neutral Red
d) Rhodamine - B
- 6) The unit NTU is used to measure _____ of waste water.
a) Turbidity
b) BOD
c) COD
d) Total solids
- 7) _____ type of lake balance between activity of producer organism and consumer organism is equal.
a) Eutrophic
b) Oligotrophic
c) Mesotrophic
d) All of these
- 8) _____ is the primary technique used in gathering audit information.
a) Public disclosure
b) Audit interviews
c) Audit Protocol
d) Palercts

- 9) EIA is _____
- Environmental Impact Assessment
 - Environmental Information Assessment
 - Environmental Indian Association
 - Environmental Implementation Association
- 10) The intensity of life activities of the organism is reflected by _____
- TKN
 - COD
 - TOC
 - BOD
- 11) The waste water generated by _____ industry is called 'Spent wash'.
- Paper & pulp
 - Cyanide
 - Textile
 - Distillery
- 12) _____ method have been popularly used for the sludge dewatering in industrial waste treatment.
- Activated sludge process
 - Sludge drying beds
 - Oxidation ponds
 - Sludge digestion
- 13) _____ organism play important role in activated sludge process.
- Zoogloea ramigera
 - E. Coli
 - Enterobacter specices
 - A- hydrophila
- 14) The solubility of oxygen is very high at _____ C⁰ temperature.
- 10
 - 20
 - 30
 - 40

PART II

Attempt any four questions:

- Q.2** Write about microorganisms in waste treatment with reference to source, enrichment, acclimatization & mass scale production. **14**
- Q.3** Write in detail characteristics and treatment of Textile industry waste water. **14**
- Q.4** Write an essay on 'Eutrophication'. **14**
- Q.5** **Write short answers any two:** **14**
- Vermicomposting
 - Do and HRT
 - EI Nino and Acid Rain
- Q.6** **Write short answers any two:** **14**
- Characteristics of Distillery Wastes
 - Types of Biological treatments
 - Enzymes and Pollution