

Seat No.	
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Cytology and Taxonomy of Microorganisms

Max. Marks: 80

Time: 03:00 PM To 06:00 PM

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

10

- 1) The taxa having the ending -mycetes is _____.
a) Division b) Subdivision
c) Class d) Order
- 2) In binomial nomenclature, second name represents _____.
a) species b) order
c) kingdom d) class
- 3) Actinomycetes' are known as _____.
a) Fungi b) Algae
c) True bacteria d) Pseudobacteria
- 4) What type of colonies are formed by Mycoplasmas on agar plate?
a) Colourless b) Coloured
c) lawn formation d) fried-egg
- 5) Select the statement that does not apply to the kingdom Fungi _____.
a) The fungi are eukaryotic, multicellular, ingestive heterotrophs
b) Some fungi form beneficial interrelationships with plants
c) The fungal life cycle typically includes a spore stage
d) Certain fungi are natural sources of antibiotic substances
- 6) Parasitic alga is _____.
a) Cephaleuros b) Ulothrix
c) Spirogyra d) Chlamydomonas
- 7) NAG and NAM of peptidoglycan layer is linked by _____.
a) beta-(1,4) glycosidic linkage
b) alpha-(1,4) glycosidic linkage
c) alpha-(1,6) glycosidic linkage
d) beta-(1,6) glycosidic linkage
- 8) Which of the following statement about Rickettsiae is not correct?
a) Rickettsiae are obligate intracellular bacteria
b) Weil-Felix test can be used in the diagnosis of rickettsial disease
c) All the rickettsial diseases are zoonoses
d) Rickettsiae are gram-negative but stain poorly with standard Gram Stain
- 9) The symbiotic association of algae and fungi is known as _____.
a) Mycorrhiza b) Lichen
c) Mycoplasma d) Both (a) and (b)

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

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

- 1) The rickettsia are obligate intracellular parasites.
- 2) The chlamydia are gram-negative.
- 3) Mycoplasma stain with the Gram stain.
- 4) Cyanobacteria are eukaryotic.
- 5) Dyes are obtained from some lichen.
- 6) Red alga belongs to Rhodophycophyta.

Q.2 Answer the following**16**

- a) Structure of fungi
- b) Applications of Lichen
- c) Bacterial nomenclature
- d) Numerical taxonomy

Q.3 Answer the following.

- a) Outline classification of prokaryotic organisms.
- b) Cell differentiation in bacteria.

**10
06****Q.4 Answer the following.**

- a) General characteristics of mycoplasma.
- b) Importance of actinomycetes.

**08
08****Q.5 Answer the following.**

- a) General characteristics of rickettsia
- b) Mycorrhizae

**08
08****Q.6 Answer the following.**

- a) General characteristics of Cyanobacteria.
- b) Outline classification of Actinomycetes.

**10
06****Q.7 Answer the following.**

- a) Surface properties of bacteria.
- b) Bergey's manual of Determinative Bacteriology.

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06**

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**M.Sc. (Semester - I) (New) (CBCS) Examination: Oct/Nov-2022
(MICROBIOLOGY)**

Microbial Chemistry and Enzymology

Day & Date: Tuesday, 14-02-2023

Max. Marks: 80

Time: 03:00 PM To 06:00 PM

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

Q.1 A) Choose the correct alternatives. 10

- 1) The repeating units of proteins are _____.
a) glucose units b) amino acids
c) fatty acids d) peptides
- 2) Hexoses are _____.
a) trisaccharides b) disaccharides
c) oligosaccharides d) monosaccharides
- 3) _____ is allosteric enzyme.
a) Kinase b) Aspartate transcarbamoylase
c) Pyruvate dehydrogenase d) Chymotrypsin
- 4) _____ is also known as cyanocobalamin.
a) Vitamin A b) Vitamin E
c) Vitamin B 12 d) Vitamin C
- 5) _____ is ketose.
a) Fructose b) Glucose
c) Galactose d) Maltose
- 6) The processes by which enzymes are fixed to solid support is called _____.
a) isomerization b) phosphorylation
c) immobilization d) polymerization
- 7) _____ is heteropolysaccharide, which functions as tissue cement.
a) Glycogen b) Cellulose
c) Starch d) Hyluronic acid
- 8) _____ are channel proteins involved in transport across cell membrane.
a) Terpens b) Prostaglandins
c) Porins d) Interleukins
- 9) Starch contain amylose and amylopectin in _____ proportion.
a) 1:3 b) 1:10
c) 1:1 d) 1:4
- 10) The protein moiety of an enzyme is known as _____.
a) Holo enzyme b) Apo enzyme
c) Co enzyme d) Enzyme

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

- 1) Immobilized enzymes are used again and again.
- 2) J. Monod and F. Jacob discovered allosteric enzymes.
- 3) Michaelis-Menten model is also referred to as "rapid equilibrium model".
- 4) Lactate dehydrogenase is isoenzyme.
- 5) In bacteria, the Krebs's cycle occurs in the mitochondrial matrix.
- 6) ATP synthase is found in the outer membrane of both bacteria and mitochondria.

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

- a) Active site and allosteric site.
- b) Multienzyme complex.
- c) Structural levels of proteins
- d) Induced fit hypothesis.

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

- a) Explain factors influencing enzyme action.
- b) Describe Michaelis-Menten equation.

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

- a) Nomenclature and structures of carbohydrates.
- b) Write in detail on chlorophyll.

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

- a) Describe lipid types and nomenclature.
- b) Explain Chemistry of Porphyrins.

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

- a) Describe structures and functions of vitamins.
- b) Basic concepts of kinetics, examples and significance.

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

- a) Acid base catalysis and strain distortion.
- b) Microbial hormones and their significance.

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

- 1) ELISA is not used for detection of viral diseases.
- 2) Viruses possesses spikes composed of carbohydrate.
- 3) Interferons are more effective oddly.
- 4) Endosomes are involved in uncoating of the incoming virion.
- 5) Benign tumor invades into other tissues.
- 6) Carcinoma is cancer of epithelial tissues.

Q.2 Write short notes on:**16**

- a) Purification of viruses by adsorption
- b) Pathogenesis of Picorna virus
- c) Classification of Plant viruses
- d) Morphological structure of virus

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

- a) Describe various antiviral drugs used to control of viral infections.
- b) Describe in detail infectivity assays.

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

- a) Describe in detail Lysogeny.
- b) Describe the Genetic analysis of viruses.

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

- a) Describe in detail cultivation of viruses by cell cultures.
- b) Explain in detail Host cell transformation by viruses.

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

- a) Describe in detail SARS.
- b) Describe in detail Adenovirus infections.

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

- a) Describe in detail Haemagglutination.
- b) Describe various vaccines used to prevent viral infections.

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Research Methodology and Scientific Writing

Max. Marks: 80

Time: 03:00 PM To 06:00 PM

2) Attempt any three questions from O. No. 3 to O. No. 7.

3) Figure to right indicate full marks.

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- Multiple choice questions:
- 1) Peer review can best be summarized as _____.
 - a) a process for evaluating the safety of boat docks.
 - b) a process by which independent scientists evaluate the merit of manuscript
 - c) a process by which a scientist's friends can give him or her advice.
 - d) a method of typesetting in publishing.
 - 2) In a blind peer review process _____.
 - a) Authors identity is NOT disclosed
 - b) There is no corresponding author
 - c) No reviewers are assigned
 - d) Authors identity is disclosed
 - 3) One of the main purposes for including a "Materials and Methods" section in a paper is to _____.
 - a) to advertise scientific products
 - b) to demonstrate that your methods are superior to other scientists' methods
 - c) to allow other scientists to reproduce your findings
 - d) for no reason; most journals do not require this section
 - 4) _____ sections is not a basic section of a quantitative research paper.
 - a) Results
 - b) Methods
 - c) References
 - d) Criticisms
 - 5) _____ is typically not on the title page of a manuscript.
 - a) Author names
 - b) Author affiliation
 - c) Keywords
 - d) Research acknowledgements
 - 6) The main purpose of a "References" section in a scientific paper is to _____.
 - a) acknowledge your colleagues who gave you advice
 - b) present other papers that the reader might want to consult
 - c) provide a list of scientists who have repeated your research
 - d) improve one's research impact factor
 - 7) _____ of the following is NOT a part of IMRAD format.
 - a) Introduction
 - b) Discussion
 - c) Abstract
 - d) Results

- 8) _____ is the purpose of the abstract.
- Provide a clear and in depth discussion of the implications of the research.
 - Discuss the motivation for the research but provide no information about the findings
 - Provide a clear but concise summary of the research
 - Discuss why the authors think the findings are important
- 9) _____ is a search engine.
- NIH
 - NLM
 - CSIR
 - Google
- 10) Often, one of the best places to start reading an article is _____.
 - at the end, in the "Discussion" section
 - at a random spot in the middle of the article
 - in the "Materials and Methods" section
 - in the "References" section

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

- The process of peer review always ensures that a scientific paper is correct.
- Tables and figures are used in a scientific paper to present and explain research results.
- NCBI stands for National Computer Biological Information.
- Plagiarism is allowed in publishing a scientific document.
- Letter "I" in IMRAD stands for Introduction.
- Poster is a type of scientific document.

Q.2 Answer the following**16**

- Write a note on NCBI.
- Write a note on Search engines.
- What is Plagiarism?
- Write a note on Blind review process

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

- Explain in detail IMRAD format.
- Write a note on Peer review process.

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

- State the importance of proofreading of manuscript.
- Explain difference between "subscription" based and "open access" journals.

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

- Write an essay on, how to prepare poster?
- What is Bibliography?

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

- Write a note on scientific documents.
- Write a note on literature survey.

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

- Comment on use of tenses in manuscript preparation.
- State the importance of Google in literature survey

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Biophysics and Bioinstrumentation

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.

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- Multiple choice questions:**
- 1) Atomic absorption spectroscopy is used for the analysis of _____.
a) Viscosity b) Gravity
c) Density d) Metals
 - 2) Amino acids are joined to each other by _____ band.
a) Peptide b) Nucleotide
c) Peptone d) Double
 - 3) In Laminar air flow cabinet _____ filter is used.
a) Seitz b) HEPA
c) Vacuum d) Membrane
 - 4) Electron microscope is an invention that uses the beam of _____.
a) Light rays b) U.V. rays
c) Electrons d) Infra Red rays
 - 5) _____ particles are highly penetrating.
a) Gamma b) Beta
c) Alfa d) Zeta
 - 6) Chromatography with solid stationary phase is called _____ chromatography.
a) Gel b) Adsorption
c) Affinity d) Ion exchange
 - 7) Centrifugation is based on _____ law.
a) Partick's b) Beer's
c) Stoke's d) Lambert's
 - 8) Gieger Muller's counter is device used to detect _____.
a) Mass b) Charge
c) Momentum d) Radiation
 - 9) _____ technique is used to study the three dimensional structure of molecule.
a) Mass spectroscopy b) X-ray crystallography
c) IR spectroscopy d) U.V. visible spectroscopy
 - 10) The biological response of the biosensor is determined by _____ membrane.
a) Biocatalytic b) Physical
c) Chemical d) Artificial

B) Write True or False. 06

- 1) Ninhydrin solution is used as locating agent in paper chromatography.
- 2) Sedimentation is a principle of NMR spectroscopy.
- 3) Surfactant are compounds lowers the surface tension of liquid.
- 4) Polari meter is used for measuring pH.
- 5) Electrophoresis technique separates charged particles using electric field.
- 6) CO₂ is used as carrier gas in gas chromatography.

Q.2 Answer the following 16

- a) pH meter
- b) Phase contract microscope
- c) Fluorimetry
- d) Conformational properties of proteins

Q.3 Answer the following. 16

- a) Describe in detail electrochemical cells.
- b) Describe in detail Colorimeter.

Q.4 Answer the following. 16

- a) Describe in detail Autoradiography.
- b) Describe in detail Atomic Absorption Spectroscopy.

Q.5 Answer the following. 16

- a) Describe in detail Biosafety Cabinets.
- b) Describe in detail NMR Spectroscopy.

Q.6 Answer the following. 16

- a) Describe in detail Electrophoresis.
- b) Describe in detail physical and chemical properties of amino acids.

Q.7 Answer the following. 16

- a) Explain in detail principle and working of Gas sensing electrodes.
- b) Describe in detail structure of proteins.

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**M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov-2022
(MICROBIOLOGY)
Microbial Genetics**

Day & Date: Monday, 20-02-2023
Time: 11:00 AM To 02:00 PM

Max. Marks: 80

- 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) Lac Z gene in Lac operon express to synthesize _____.
a) Beta- Galactosidase b) Galactoside permease
c) acetylase d) Repressor
- 2) In A form of DNA, one turn of helix consists of _____.
a) 10 b) 11
c) 9.33 d) 8
- 3) Proofreading and mismatch repair in DNA is carried out by _____.
a) DNA polymerase I b) DNA polymerase II
c) DNA polymerase III d) Exonuclease
- 4) Synthesis of RNA primers for DNA chain elongation is carried out by _____.
a) RNA polymerase b) RNA primase
c) DNA polymerase d) RNA transcriptase
- 5) The methionine carried by Archaeal initiator tRNA is _____.
a) N-formylated b) non N –formylated
c) N-methylated d) a and b
- 6) SOS response brings to halt _____.
a) DNA synthesis b) RNA synthesis
c) Protein synthesis d) Carbohydrate synthesis
- 7) The coding sequences on the eukaryotic genes are termed as _____.
a) introns b) exons
c) split genes d) interrupted genes
- 8) pBR 322 is _____.
a) an original plasmid b) modified plasmid
c) viral genome d) a transposons
- 9) A replication by semiconservative mode in E.coli was experimentally proved by _____.
a) Zinder and Lederberg b) Delbruck & Delbruck
c) Watson & Crick d) Meselson and Stahl
- 10) The replicon encoding genes essential or the cell survival is called as _____.
a) genome b) chromosome
c) codon d) proteome

B) Fill in the blanks OR Write true/false

06

- 1) 2 μ plasmid is present in the yeast _____.
- 2) Transitions are the mutations in which purine is replaced by purine.
 - a) True
 - b) False
- 3) DNA as a genetic material is proved by _____ experiment.
- 4) In Lambda phage lytic as well as lysogenic cycle occurs.
 - a) True
 - b) False
- 5) Photoreactivation is DNA repair mechanism of thymine dimer with enzyme photolyase.
 - a) True
 - b) False
- 6) Helix unwinding during replication is accomplished by _____.

Q.2 Answer the following

16

- Explain RFLP.
- Enzymes involved in DNA replication
- Explain various mutations- base pair and frame shift.
- Describe forms and types of DNA.

Q.3 Answer the following

16

- Define Operon. Explain in detail 'Lac operon'.
- Explain the technique and application of PCR.

Q.4 Answer the following

16

- What is transcription? Explain the transcription process in prokaryotes.
- What is DNA sequencing? Explain in brief Sanger DNA sequencing.

Q.5 Answer the following

16

- Explain in detail DNA damage and repair.
- Explain the techniques and applications of DNA finger printing.

Q.6 Answer the following

16

- Explain in detail mechanism of DNA replication.
- Explain structure, genetic map and lytic cycle of T4 phage.

Q.7 Answer the following

16

- Explain in detail various types of plasmid and its importance.
- Describe translation in prokaryotes.

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**M.Sc. (Semester - II) (New) (CBCS) Examination: Oct/Nov - 2022
(MICROBIOLOGY)**

Microbial Ecology and Diversity

Day & Date: Tuesday, 21-02-2023

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

- 1) The ecological niche of an organism is its _____.
a) Foraging area b) Territory
c) Habitat d) Way of life
- 2) _____ organisms are responsible for biodeterioration of stones.
a) Phototrophic b) Chemolithic
c) Endolithic d) Lichens
- 3) *Usnea* is common example of _____.
a) lichens b) algae
c) protozoa d) fungi
- 4) _____ analyzes the sequences of total community RNA, rather than DNA.
a) Metagenomics b) Metaproteomics
c) Metatranscriptomics d) Genomics
- 5) *Photobacterium Shewanella* is an example of _____.
a) xerophile b) thermophile
c) Barophile d) halophile
- 6) The functional and sequence-based analysis of the collective microbial genomes from an environmental sample is called as _____.
a) genomics b) metagenomics
c) proteomics d) genome
- 7) Organisms which contain both chlorophyll A and B and carry out oxygenic photosynthesis are _____.
a) Diazotrophs b) Nondiazotrophs
c) Prochlorales d) Archaeobacteria
- 8) Which of these ecosystems has the lowest net primary production per square meter?
a) A salt marsh b) An open ocean
c) A coral leaf d) A grassland
- 9) *Rhodospirillum rubrum* is an example of _____.
a) Green sulphur bacteria b) Purple non sulphur bacteria
c) Cyanobacteria d) green non sulphur bacteria

- 10) Fe_3O_4 particles are present in _____ bacteria.
- | | |
|------------------|------------------------------|
| a) magnetotactic | b) Magnetotactic acidophilic |
| c) alkaliphilic | d) Xerophiles |

B) Fill in the blanks OR Write true/false

06

- 1) *Thermus aquaticus* produces _____ enzyme used in PCR.
- 2) _____ component is responsible for emission of light.
- 3) 'Bioluminescence is an example of detrimental association'.
a) True b) False
- 4) Lichen is an example of association between photosynthetic _____ and heterotrophic fungi.
- 5) Thiobacillus species grows at extreme acidic pH.
a) True b) False
- 6) _____ pigment is present in cyanobacteria.

Q.2 Answer the following

16

- Microorganisms in prospecting of oil.
- Explain with examples microbial interactions.
- Explain levels and types of microbial diversity.
- Explain with examples of osmophiles.

Q.3 Answer the following

16

- a) General characteristics of purple and green sulphur bacteria.
- b) Describe concept of biodeterioration and biodeterioration of various materials.

Q.4 Answer the following

16

- Define extremophiles and describe in detail psychrophilic and Thermophilic organisms.
- Describe oxygenic photosynthesis in microbes – cyanobacteria.

Q.5 Answer the following

16

- Write a note on culture independent methods of studying microbial diversity with special reference to metagenomics.
- Give an account of molecular based culture dependent methods for assessing microbial diversity.

Q.6 Answer the following

16

- Describe bioluminescent bacteria.
- Define ecosystem with examples.

Q.7 Answer the following

16

- General characteristics of methanogenic archaebacteria.
- Give an account of N_2 fixing bacteria.

B) Write True / False**06**

- 1) In anaerobic respiration terminal electron acceptor is O₂
- 2) Initial step in pyrimidine biosynthesis is formation of carbamoyl phosphate.
- 3) Proteins are transported by group translocation.
- 4) Chorismic acid is common intermediate.
- 5) Ribonucleoside is made up of ribose sugar and nitrogen base.
- 6) TCA cycle is a major route of ATP generation in phototrophs.

Q.2 Answer the following**16**

- a) Simple diffusion
- b) Components of electron transport system
- c) Structure of mitochondria
- d) Role of catalase super oxide dismutase

Q.3 Answer the following**16**

- a) Write in detail about biosynthesis of saturated fatty acids.
- b) Write in detail about theories of ATP formation.

Q.4 Answer the following**16**

- a) Give an account on microbial hormones and their significance.
- b) Degradation of aromatic hydrocarbons by beta ketoadipate pathway.

Q.5 Answer the following**16**

- a) Write on photosynthetic electron transport chain.
- b) Give brief account on citric acid cycle.

Q.6 Answer the following**16**

- a) Write on group translocation and facilitated diffusion.
- b) Mitochondrial electron transport system.

Q.7 Answer the following**16**

- a) Explain drug metabolism and detoxification.
- b) Explain in brief amino acid synthesis.

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

- B) Fill in the blanks.** **06**
- 1) Taeniasis in humans is a parasitic infection caused by the tapeworm species _____.
 - 2) Japanese encephalitis is a virus in the _____.
 - 3) _____ is the definitive host for *Ascaris lumbricoides*.
 - 4) _____ vaccination is used as prophylactic measure for rubella.
 - 5) _____ produce colony with "Fried egg appearance".
 - 6) Radiolabelled ligand is used in _____ test.
- Q.2 Answer the following** **16**
- a) Enzymes in medical diagnosis.
 - b) Aids and prevalence of TB, Mycoplasma.
 - c) Write on *Balantidium coli*.
 - d) Enlist the symptoms of rubella infection.
- Q.3 Answer the following** **10**
- a) Write in detail about "Dental Caries".
 - b) Write a note on "ELISA".
- Q.4 Answer the following** **08**
- a) Discuss in detail about "Antibiotics affecting Protein synthesis of bacteria".
 - b) Write an essay on Dengue fever.
- Q.5 Answer the following** **08**
- a) Write an essay on animal tissue culture.
 - b) Discuss in detail about Mode of action of cholera toxin.
- Q.6 Answer the following** **06**
- a) Discuss in detail about Laboratory diagnosis of *Helicobacter pylori*.
 - b) Write a note on "pathogenic fungi".
- Q.7 Answer the following** **08**
- a) Discuss in detail about collection, transportation and preliminary processing of clinical specimen.
 - b) Write an essay on Herpes.

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Set **P**

**M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2022
(MICROBIOLOGY)**

Molecular Biology and Genetic Engineering

Day & Date: Monday, 13-02-2023

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 A) Multiple choice questions. 10

- 1) Which of the following statements are true regarding southern blotting?
 - a) developed by E. M. Southern
 - b) DNA-DNA hybridization is the basis
 - c) The transfer of DNA fragments from gel to nitrocellulose membrane is called blotting
 - d) all of these
- 2) Which of the following technique is not used for protein engineering?
 - a) DNA shuffling
 - b) Error-prone PCR
 - c) rDNA technology
 - d) DNA fingerprinting
- 3) The division of cytoplasm is known as _____.
 - a) Mitosis
 - b) Synapsis
 - c) Cytokinesis
 - d) Karyokinesis
- 4) What is the name of the site where foreign DNA can be inserted in the plasmid of Agrobacterium?
 - a) t-RNA
 - b) c-DNA
 - c) T-DNA
 - d) B-DNA
- 5) Which of the following is a commonly used label in blotting techniques?
 - a) Vimentin
 - b) Biotin
 - c) Avidin
 - d) streptomycin
- 6) Primers used for the process of polymerase chain reaction are _____.
 - a) Single-stranded DNA oligonucleotide
 - b) Double-stranded DNA oligonucleotide
 - c) Single-stranded RNA oligonucleotide
 - d) Double-stranded RNA oligonucleotide
- 7) The enzyme used to remove the phosphate group from the 5' hydroxyl group is _____.
 - a) Restriction endonuclease
 - b) DNA ligase
 - c) DNA polymerases
 - d) Alkaline phosphatase
- 8) A method used to insert DNA molecules into the cells by using short electrical impulses is known as _____.
 - a) biolistics
 - b) microinjection
 - c) liposomes
 - d) electroporation

- 9) Nucleotide triphosphates (dNTPs) are added to the growing DNA strand during the phase _____.
a) Extension / elongation b) Annealing
c) Denaturation / Separation d) Preparation
- 10) A technique for making millions of copies of a specific region of DNA.
a) DNA ligase b) Restriction enzymes
c) Gel electrophoresis d) Polymerase chain reaction

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

- 1) RNA is copied into complementary DNA (cDNA) by Reverse transcriptase.
- 2) In the semiconservative type of DNA replication, of the two newly formed molecules, one is purely a new one and the other is an old one.
- 3) Western blotting technique is used in DNA fingerprinting.
- 4) A person with a hereditary disease can be cured with the help of gene therapy.
- 5) Genome-wise gene expression analysis is performed using DNA microarrays.
- 6) RNA polymerase is necessary to make accurate copies of vector DNA.

Q.2 Answer the following**16**

- a) Discuss the Cell homeostasis.
- b) Write a note on the Human genome project.
- c) Write a note on DNA fingerprinting.
- d) Enlist the all tools required for genetic engineering and write the information on DNA ligase.

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

- a) Explain Protein engineering.
- b) Discuss the Identification of Genetic Changes in Cancer.

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

- a) Explain the cell cycle and its regulation.
- b) Discuss the Oncogenes and protooncogenes.

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

- a) Explain DNA sequencing by the Sanger dideoxy method.
- b) Enlist all blotting techniques and describe in detail the Southern blotting technique.

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

- a) Enlist all examples of plasmid vectors used for r DNA formation and write the information on Ti plasmid vectors.
- b) Explain the Gene therapy.

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

- a) Discuss the Screening of recombinants by Blue- white screening.
- b) Explain the applications of Genetic engineering in Agriculture, Industries.

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Bioprocess Technology and Fermentation Technology

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.

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- 1) _____ is distilled beverage derived from grains.
a) Whisky b) Beer
c) Rum d) Cognac
- 2) Cats are used for _____ testing.
a) Carcinogenicity b) Assay
c) Allergy d) Toxicity
- 3) Molasses is waste of _____ industry.
a) Dairy b) Sugar
c) Paper & Pulp d) Starch
- 4) Vortex formation during fermentation is reduced by _____.
a) Spargers b) Cooling coils
c) Baffles d) Impellers
- 5) Mushroom Agaricus bisporus belongs to family _____.
a) Rubiaceae b) Malvaceae
c) Solanaceae d) Agariaceae
- 6) Streptomycin fermentation is carried out of _____ °C temperature.
a) 28 b) 20
c) 10 d) 42
- 7) Lyophilization is used for _____ of culture.
a) Sterilization b) Incubation
c) Growing d) Presentation
- 8) _____ is produced by Dual fermentation method.
a) Vinegar b) Ethanol
c) Streptomycin d) Dextran
- 9) _____ is an example of upstream processing.
a) Cell lysis b) Media formulation
c) Packaging d) Product recovery
- 10) In metabolite regulation feedback repression occurs of _____ level.
a) Protein b) Product
c) Gene d) Recovery

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

- 1) Vitamin B12 is Iron containing vitamin.
- 2) Antibiotic streptomycin was discovered by Sir Alexander Flemming.
- 3) 2-6, Diaminohexonic acid is nothing but L-lysine.
- 4) Dextran is used as Antithrombotic agent in medical field.
- 5) Synchronous culture is the microbial cells having same growth stage.
- 6) YDNA technology has not application in strain improvement.

Q.2 Answer the following**16**

- a) Note on secondary metabolites
- b) Describe the continuous fermentation.
- c) Write on sterilization of fermenter
- d) Note on Nano Biotechnology

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

- a) Describe in detail fermentation media.
- b) Explain in detail Industrial production of mushroom.

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

- a) Write an essay on Vitamin B12 production.
- b) Describe various parameters regulated during fermentation.

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

- a) Describe in detail secondary screening.
- b) Give the Guidelines for safety in microbiological process.

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

- a) Comment on control of metabolic pathways.
- b) Give the computer application and automation in fermentation industry.

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

- a) Write an essay on IPR.
- b) Explain in detail sterility testing.

Seat No.	
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Set **P**

**M.Sc. (Semester - III) (New) (CBCS) Examination: Oct/Nov-2022
(MICROBIOLOGY)**

Immunology and Immunotechnology

Day & Date: Wednesday, 15-02-2023

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 A) Multiple choice questions.**10**

- 1) What is referred as the immunity to infections, which an individual possesses due to his genetic and constitutional make up?
 - a) Specific
 - b) Acquired
 - c) Innate or natural
 - d) Artificial
- 2) Which organ specializes in filtering blood and trapping blood-borne antigens?
 - a) Spleen
 - b) Lymph nodes
 - c) Thymus
 - d) Mucosa Associated Lymphoid Tissues
- 3) Which antibody is found in colostrums, saliva and tears?
 - a) IgE
 - b) IgA
 - c) IgD
 - d) IgG
- 4) Which bonds link the 4-peptide chain structure of the Ig molecule composed of 2H & 2L chains?
 - a) disulphide
 - b) dihydrogen
 - c) dipeptide
 - d) dinitrogen
- 5) What are called as soluble proteins or glycoproteins released by one cell population that acts as an intercellular mediator or signaling molecule in immunity?
 - a) Cytokines
 - b) Tumor Necrosis Factors
 - c) Bacteriocins
 - d) Antibiotics
- 6) Which complex plays important role in antigen presentation in the humoral immunity?
 - a) class I MHC
 - b) class II MHC
 - c) class III MHC
 - d) class IV MHC
- 7) Which Immunodeficiency disease results from a mutation in the ATM gene?
 - a) DiGeorge syndrome
 - b) Ataxia-telangiectasia
 - c) Hypogammaglobulinemia
 - d) Agammaglobulinemia
- 8) What is called to a group of inherited immune deficiencies characterized by a low concentration of antibodies in the blood due to the lack of particular lymphocytes in the blood and lymph?
 - a) DiGeorge syndrome
 - b) DiGeorge syndrome
 - c) Hypogammaglobulinemia
 - d) Agammaglobulinemia

- 9) What is known as the serum of animal or human containing antibodies against a specific disease, used to confer passive immunity to that disease?
- a) Vaccine b) Antibody
c) Hyper Immune Sera d) Adjuvant
- 10) Which vaccine is given to prevent tetanus, pertusis and diphtheria?
- a) DDT b) TAB
c) DPT d) MMR

B) Fill in the blanks OR Write true/false.

06

- 1) In ELISA test, substrate used is _____ which is acted by an enzyme alkaline phosphatase.
- 2) Both the Pfizer-BioNTech and the Moderna COVID-19 vaccines use mRNA. (True or False)
- 3) _____ occurs when the recipient's immune system attacks the donated graft and begins destroying the transplanted tissue or organ.
- 4) Chemokines, interferons, interleukins, lymphokines, and tumor necrosis factor are _____.
- 5) T cells and B cells are granular leucocytes. (True or False)
- 6) Encapsulated bean-shaped structures containing a reticular network packed with lymphocytes, macrophages and dendritic cells, clustered at junctions of the lymphatic vessels are called as _____.

Q.2 Answer the following

16

- Explain acquired immunity.
- Write on immune response to viral infections.
- Discuss the H2 and HLA complex.
- Explain Secondary immunodeficiency disorders: HIV infection.

Q.3 Answer the following.

16

- Write on Classification of common vaccines: whole cell, purified macromolecules recombinant antigen vaccines, recombinant vector vaccines, DNA vaccines, synthetic peptide vaccines.
- Explain schematically Thymus and Spleen.

Q.4 Answer the following.

16

- Explain Cytokines w.r.t. general properties & their role.
- Write on Primary immunodeficiency disorders and types.

Q.5 Answer the following.

16

- Describe types of Non organ specific autoimmunity.
- Write on Transplantation immunology w.r.t. types of grafts, transplantation antigens, graft rejection mechanism and tissue typing.

O.6 Answer the following.

16

- Describe ELISA technique with examples.
- Write on Common immunization programme with examples.

Q.7 Answer the following.

16

- Write on Cells of immune system w.r.t. Structure, types and functions
- Describe Immunoglobulin types and properties.

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Set **P**

**M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov-2022
(MICROBIOLOGY)**

Pharmaceutical Microbiology

Day & Date: Monday, 20-02-2023

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) Antibiotic Penicillin inhibits cell wall-biosynthesis by inhibiting the biosynthesis of _____.
a) lipopolysaccharide b) cellulose
c) peptidoglycan d) proteins
- 2) _____ antibiotic is effective in treating oral Candidiasis.
a) Nystatin b) Bacitracin
c) Tetracycline d) Griseofulvin
- 3) Streptomyces orientalis produces _____ antibiotic.
a) Cephalosporins b) Cycloserine
c) Bacitracin d) Vancomycin
- 4) _____ department has responsibility and authority to approve or reject batch of finished goods.
a) Quality assurance b) Quality control
c) Store d) Production
- 5) Systemic mycoses can be effectively controlled by using _____.
a) Bleomycin b) Acyclovir
c) Streptomycin d) Amphotericin
- 6) _____ is the test performed for sterile pharma products.
a) Pyrogen test b) CSF test
c) Cytokine test d) Tuberculin test
- 7) _____ enzyme is used as clot buster to dissolve clots in the arteries.
a) Asparaginase b) Streptokinase
c) Collagenase d) Glutaminase
- 8) _____ antimicrobial drug is synthetic.
a) Sulfanilamide b) penicillin
c) Actinomycin d) neomycin
- 9) _____ antimicrobials inhibit the activity of DNA gyrase.
a) polymyxin B b) clindamycin
c) nalidixic acid d) rifampin
- 10) _____ drug classes specifically inhibit neuronal transmission in helminths.
a) Quinolines b) Avermectins
c) Amantadines d) Imidazoles

- B) Fill in the blanks.** **06**
- 1) _____ test is used to assess the safety of industrial product.
 - 2) Ame's test uses several strains of the bacterium _____ that carry mutations involved in histidine synthesis.
 - 3) _____ methods are not used in environmental monitoring.
 - 4) _____ is the pore size of membrane used for membrane filtration in sterility testing.
 - 5) *Bacillus licheniformis* is used for production of _____.
 - 6) _____ is the precursor used for the production of Penicillin G.
- Q.2 Answer the following.** **16**
- a) Brief on Chemical disinfectants.
 - b) List mechanisms of Bacterial resistance to Antibiotics.
 - c) Microbial contamination and spoilage of implants.
 - d) Application of microbial enzymes in pharmaceuticals.
- Q.3 Answer the following.**
- a) Describe in detail Macrolide antibiotics. **08**
 - b) Highlight the details of antitumor antibiotics. **08**
- Q.4 Answer the following.**
- a) Describe mode of action of Quinolone and Bacterial resistance to Quinolone. **08**
 - b) Write in detail on how the antimicrobial agents reach the targets? **08**
- Q.5 Answer the following.**
- a) Comment on microbial contamination and spoilage of sterile injectables, ophthalmic preparations. **10**
 - b) Brief on clinical trials of Vaccine. **06**
- Q.6 Answer the following.**
- a) Describe Government regulatory practices in Pharmaceutical industries. **08**
 - b) Write on significance of Biosensors in pharmaceuticals. **08**
- Q.7 Answer the following.**
- a) Write on validation Good Manufacturing Practices (GMP) and Good Laboratory Practices (GLP) in pharmaceutical industries. **10**
 - b) What are responsibilities of QA and QC? **06**

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Food and Dairy Microbiology

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) *Streptococcusagalactae* is associated with _____.
a) Mastitis b) Sore throat
c) Scarlet fever d) Listeriosis
- 2) The time temperature relationship for Flash pasteurization is _____.
a) 62.8°C for 15 min b) 71.7°C for 15 sec
c) 71.7°C for 30 min d) 138°C for 1 sec
- 3) _____ is an example of soft cheese.
a) cheddar b) Camembert
c) cottage d) mozzarella
- 4) The production of blue discolouration in milk by is caused by _____.
a) *Pseudomonas Syncyanea* b) *Pseudomonas synxantha*
c) *Pseudomonas aeruginosa* d) *Pseudomonas putida*
- 5) Ropiness in milk is mainly caused by _____.
a) *Saccharomyces cerevisiae* b) *Alcaligenes viscolactis*
c) *Geotrichum candidum* d) *Proteus vulgaris*
- 6) Aflatoxicosis is caused by _____.
a) *Aspergillus flavus* b) *Streptococcus pyogenes*
c) *Brucella abortus* d) *Salmonella enteritidis*
- 7) The dominant protein present in milk is _____.
a) lactalbumin b) casein
c) lactoglobulin d) all of the above
- 8) Acetaldehyde is the major flavor compound in _____.
a) cheese b) Yoghurt
c) Kefir d) kumiss
- 9) The Term ‘Eye formation’ is related to _____.
a) Skyr b) Basundi
c) Swiss cheese d) Yoghurt
- 10) The target microorganism in food canning is _____.
a) *Streptococcus thermophilus* b) *Lactobacillus bulgaricus*
c) *Clostridium botulinum* d) *Bacillus*

- B) Answer the following.** **06**
- 1) What is FSSAI?
 - 2) Name the causative agent of Q fever.
 - 3) _____ is an important antimicrobial substance present in milk.
 - 4) Name different types of Yoghurts. Name any one organism used as a starter culture.
 - 5) _____ is the target organism used in food canning.
 - 6) Phosphatase test is performed to check the efficiency of Pasteurization. (State True/ False)

Q.2 Answer the following **16**

- a) Define food spoilage and explain spoilage of meat and fish.
- b) Antimicrobial substances present in milk.
- c) Define milk and composition of milk.
- d) Explain Food adulteration in detail.

Q.3 Answer the following **16**

- a) Microbiological analysis of milk.
- b) Prevention and control of food borne diseases.

Q.4 Answer the following **16**

- a) Explain principles of food preservation and food preservation by high temperature.
- b) Describe in detail quality and safety assurance in food and dairy industry.

Q.5 Answer the following **16**

- a) Define pasteurization and various methods of pasteurization.
- b) Write a note on food intoxication.

Q.6 Answer the following **16**

- a) Define fermented milk products types and production of Kefir, Kumiss, Bulgarian sour milk, yoghurt.
- b) What are various types of cheese? Explain production of cheddar cheese.

Q.7 Answer the following **16**

- a) Describe in detail about Food laws in India.
- b) Describe various tests in chemical analysis of milk.

Seat No.	
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**M.Sc. (Semester - IV) (New) (CBCS) Examination: Oct/Nov - 2022
(MICROBIOLOGY)**

Principles of Bioinstrumentation and Techniques

Day & Date: Wednesday, 22-02-2023

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 alternatives. (MCQ) 10

- 1) The pH electrode is an example of _____.
a) Oxygen electrode b) Optical electrode
c) Ion selective electrode d) none of these
- 2) In centrifugation frictional coefficient depends on the _____ of the biological particle.
a) size b) shape
c) speed of rotation d) All of the above
- 3) The ability of a buffer solution to resist a change in pH on the addition of strong acid or alkali is expressed by its _____.
a) Buffer capacity b) Concentration of H⁺ ions
c) Concentration of OH⁻ ions d) Buffer
- 4) _____ technique is also known as colour writing.
a) NMR b) Mass spectroscopy
c) Chromatography d) Electrophoresis
- 5) _____ are the detectors commonly used in High Performance Liquid Chromatography.
a) Variable wavelength b) Fluorescence
c) Electrochemical d) All of the above
- 6) In thin layer chromatography, the stationary phase is made of _____ and the mobile phase made of _____.
a) Liquid, Liquid b) Solid, Liquid
c) Liquid, Gas d) Solid, Gas
- 7) _____ type of microscope used for viewing unstained cells or tissue preparation.
a) Bright field b) Phase contrast
c) Fluorescence d) Compound microscope
- 8) In density gradient centrifugation _____ material is commonly used for gradient preparation.
a) Caesium chloride b) Sodium bromide
c) Percoll d) all of the above
- 9) The concept of pH was discovered by _____.
a) Wilson b) Jansen
c) Sorensen d) Henderson- Hasselbalch

- 10) Agarose is a linear polysaccharide made up from basic repeating units of ____
- galactose and 3,6 anhydrogalactose
 - agarobiose
 - galactose and Carboxy methyl cellulose
 - Both a and b

B) Fill in the blanks or write true or false.**06**

- _____ developed the first analytical centrifuge in late 1920.
- In PAGE polymerisation of acrylamide is initiated by the addition of _____ and _____.
- The process in which separated proteins are transferred from gel to nitrocellulose paper is called as _____.
- Chromatography cannot be used to purify volatile substances. (True / False)
- NMR spectroscopy with ^{13}C , ^{15}N , and ^{31}P isotopes is frequently used in biochemical studies. (True / False)
- Fluorescence intensity emitted by a molecule is dependent on the lifetime of the excited state of that particular molecule. (True / False)

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

- Define southern blotting and write in short about its principle.
- Write note on native gel electrophoresis and its applications.
- Write in short about the principle and application of ultracentrifugation.
- Write in brief about the principle of phase contrast and light microscope.

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

- Write in short about various components of electron microscope, enlist the various types of electron microscope and describe in detail about the scanning electron microscope.
- Define affinity chromatography and describe in detail about the principle, working and applications of it.

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

- Write in detail about the principle, working and applications of the molecular exclusion chromatography.
- Describe in detail about principle, working and applications of the western blotting.

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

- What is NMR and describe in detail about the principle, working and applications of the NMR spectroscopy.
- Describe in detail about the principle, working and applications of the High Performance Liquid Chromatography.

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

- Define electrophoresis and describe in detail about the principle, working and applications of the agarose gel electrophoresis for DNA.
- Describe in detail about the principle, working and applications of fluorescence spectroscopy.

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

- Describe in detail about the principle, working and applications of the atomic absorption spectroscopy.
- Define centrifugation and describe in detail about the principle, working and applications of the density gradient centrifugation.

Seat No.	
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Health care and Diagnostic Microbiology

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) _____ is normal flora of Skin of human body.
a) E.coli b) S.aureus
c) B.subtilis d) Pr. Vulgaris
- 2) _____ staining is used for identification of Myco.tuberculosis.
a) Acid fast b) Giemsa's
c) Albers d) Wilkinson
- 3) _____ is sexually transmitted disease.
a) Malaria b) Ulcer
c) Gonorrhoea d) Meningitis
- 4) _____ is an etiological agent of Diphtheria.
a) Corona virus b) Ps.aeruginosa
c) Influenza virus d) Cory.diphtheriae
- 5) Anthrax bacillus was discovered by _____ in 1876.
a) Louis Pasteur b) Robert Koch
c) Hansen d) Winogradsky
- 6) _____ test is used for diagnosis of COVID-19.
a) RT-PCR b) Tuberculin
c) Lepromin d) VDRL
- 7) Mucormycosis is also commonly called as _____ fungus.
a) White b) Green
c) Blue d) Black
- 8) Covishield, Covaxin, Sputnik are the vaccines used for prevention of _____.
a) Malaria b) COVID-19
c) Peptic ulcer d) Gonorrhoea
- 9) Fungi infections are also termed as _____ infections.
a) Mycotic b) Nosocomial
c) Acute d) Local
- 10) Cotton swabs are used for collection of _____.
a) Urine b) Stool
c) Sputum d) Blood

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

- 1) Plasmodium requires two hosts for completion of life cycle.
- 2) COVID-19 is not life-threatening disease.
- 3) Dogs saliva may act as a reservoir of Rabies virus.
- 4) Giardiasis spreads through Air.
- 5) Meningitis is inflammation of Brain and Spinal cord.
- 6) E.coli is constantly present in human stomach.

Q.2 Write short notes on.**16**

- a) Transmission of Histoplasmosis
- b) Recent advances in diagnosis of Leishmaniosis
- c) General guidelines for specimen collection
- d) Types of infections

Q.3 Answer the following**16**

- a) Describe in detail Mucormycosis.
- b) Discuss in detail Staphylococcal infections.

Q.4 Answer the following**16**

- a) Write in detail on Peptic ulcer.
- b) Describe in detail Anthrax disease.

Q.5 Answer the following**16**

- a) Discuss the various immunological methods for Diagnosis.
- b) Write in detail on Normal flora of human body.

Q.6 Answer the following**16**

- a) Describe in detail infection caused by Ent. histolytica.
- b) Describe in detail Cholera.

Q.7 Answer the following**16**

- a) Discuss in detail Gonorrhoea.
- b) Write an essay on Cestode diseases.

Seat No.	
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Recombinant DNA Technology

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) _____ developed chemical technique to synthesize polynucleotides.
a) Watson b) Franklin
c) Meselson d) H. Gobind Khorana
- 2) _____ enzyme is used to join two different types of DNA molecules.
a) Polymerase b) Ligase
c) Endonuclease d) Exonuclease
- 3) Recombinant plasmids are added to bacterial culture that has been pre-treated with _____ ions.
a) Calcium b) Uranium
c) Potassium d) Sodium
- 4) Chromosomal or genetic DNA is separated by _____.
a) Filtration b) Precipitation
c) Crystallization d) Centrifugation
- 5) The DNA segment to be cloned is called DNA _____.
a) Endogenote b) Copy
c) Insert d) Replicant
- 6) Location of plasmid DNA can be visualised by addition of _____.
a) Methylene blue b) Ethidium Bromide
c) Crystal violet d) Basic fuchsin
- 7) _____ is used for separation of very large DNA molecules.
a) Pulse field Gel electrophoresis
b) Autoradiography
c) Affinity chromatography
d) RT-PCR
- 8) _____ in PCR technique automates the repetitive steps of amplifying specific DNA sequences.
a) Restriction endonuclease b) Taq polymerase
c) DNA exonuclease d) Reverse transcriptase
- 9) DNA _____ is also a method for gene silencing through short RNAs.
a) Methylation b) Replication
c) Recombination d) Precipitation

- 10) The computational methodology that tries to identify the best matching between two molecules, a ligand and receptor are known as molecular _____.
- a) Checking b) Docking
c) Fitting d) Matching

B) Write true or false.

06

- 1) In some organisms presence of dsRNAs leads to breakdown of corresponding ss mRNA.
- 2) siRNA can either be introduced directly or by microinjection.
- 3) EcoR1 exhibits a two-fold rotational symmetry.
- 4) DNA polymerases are also called molecular scissors.
- 5) Viruses are not used as vector.
- 6) Electrophoresis was developed by Tiselius.

Q.2 Write short notes on.

16

- Cloning vectors
- Autoradiography
- Isolation of gene of desired interest
- Chemical synthesis of genes

Q.3 Answer the following

16

- Describe in detail Agarose gel electrophoresis.
- Discuss in detail Essential enzymes in Genetic Engineering.

Q.4 Answer the following

16

- Write in detail on Plasmid vectors.
- Describe in detail identification of clones containing recombinant vectors.

Q.5 Answer the following

16

- Give the various application of recombinant DNA technology.
- Describe the method of DNA sequencing.

Q.6 Answer the following

16

- Write in detail principle, method advantages and applications of Microarray.
- Describe in detail common steps in Genetic Engineering.

Q.7 Answer the following

16

- Comment on construction of Genomic and cDNA library.
- Describe in detail western blotting technique.