SLR-VK – 2

Seat No.	

M.Sc. – I (Semester – I) Examination, 2014
PROTEINS – STRUCTURE AND FUNCTIONS (Paper – II)
Biotechnology (Old)

Day and Date : Wednesday, 23-4-2014 Total Marks : 100
Time : 11.00 a.m. to 2.00 p.m.

Instructions *: 1) Question **1** is **compulsory**.*
*2) Section **I** and **II** should be written in **separate** answer books.*
*3) Figures to the **right** indicate **full** marks.*

1. Multiple choice : **20**

1) Prosthetic group is _____
   a) linked to phosphate group
   b) bound to enzyme for their activity
   c) loosely bond to enzyme for their activity
   d) none of the above

2) Bending of α-helix occur due to _____ amino acid.
   a) alanine b) lysine
   c) proline d) none

3) Quaternary structure present in _____
   a) haemoglobin b) trypsin
   c) both a) and b) d) none of the above

4) Secondary structure of protein is _____ I.
   a) α-helix b) β-Pleated sheet
   c) β-helix d) both a) and b)

5) Hydrogen bonds in α helices are _____
   a) more numerous than Van der Waal's interaction
   b) not present at phi residue
   c) about 5 A° in length
   d) roughly parallel to α helix

6) Ascorbic acid is _____
   a) Vitamin A b) Vitamin D
   c) Vitamin C d) Biotin
7) PAM matrix means _____
   a) Perfect Attention Matrix
   b) Point Accepted Mutation
   c) Point Average Mutation
   d) None of the above
8) _____ these are aromatic amino acids.
   a) Phenylalanine, Tyrosine, Tryptophan
   b) Phenylalanine, Tyrosine, Glutamine
   c) Alanine, Tyrosine, Tryptophan
   d) Tyrosine, Alanine, Glutamine
9) Two polypeptide chains of insulin are linked by _____ cross-linkage.
   a) sulphide b) disulphide
   c) both a) and b) d) none of these
10) Peptide bonds are formed between _____
   a) two nucleotides b) two amino acids
   c) both a) and b) d) all of these
11) Deficiency of vit-C results in _____
   a) muscular destropy b) Scurvey
   c) Beri-beri d) None of the above
12) _____ this is a single-letter designation of Tryptophan.
   a) W b) T c) Y d) Both b) and c)
13) The basis of the malfunction of the hemoglobin molecule in sickle cell anemia is _____
   a) Substitution of single amino acid
   b) Incorrect secondary structure
   c) Faulty binding of heme group
   d) Reduced affinity of oxygen

14) Two polypeptide chains of insulin are linked by _____ cross-linkage.
   a) sulphide b) disulphide
   c) both a) and b) d) none of these

15) Proteins are polymers of _____
   a) Sugar b) Lipids
   c) Amino acids d) Nucleotides

16) _____ complex degrades ubiquitinated protein.
   a) Proteasome b) Ribonucleoase
   c) DNA ploymerase d) None of the above

17) _____ is not a hydrophobic amino acid.
   a) Alanine b) Valine
   c) Tryptophan d) Leucine

18) _____ is the acidic amino acids.
   a) Aspartate b) Lysine
   c) Histidine d) All the above

19) Vitamin Thiamine is also called as a _____
   a) Vitamin A b) Vitamin B12
   c) Vitamin B1 d) All of these

20) Alpha helix has _____ type of hydrogen bonding.
   a) n + 2 b) n + 4
   c) n + 3 d) None of the above

SECTION – I

2. Give an account of various methods for determination of N-terminal and C-terminal amino acid of polypeptide chains. **20**

OR

2. Discuss α-helix, β-pleated sheet and collagen in detail. **20**

3. A) Write short answer (**any one**) : **10**
   a) Structure-function of Myoglobin
   b) Molecular chaperones.

B) Write short notes (**any two**) : **10**

a) Biotin

b) Henderson-Hasselbach equation

c) Zymogen

d) Niacin.

SECTION – II

4. Describe the solid-phase automated synthesis of peptides. Write a note on its applications. **20**

OR

4. Explain process of ubiquination. Add a note on proteasome complex. **20**

5. A) Write short answer (**any one**) : **10**

a) Classification of amino acids

b) Urea cycle.

B) Write short notes (**any two**) : **10**

a) Apoenzyme, holoenzyme, coenzyme

b) Vitamin B2

c) Role of trace elements Se and Mg

d) Convergent and divergent tree.

SLR-VK – 10

Seat No.	

M.Sc. (Biotechnology) (Semester – II) Examination, 2014
MOLECULAR BIOLOGY (Old) (Paper – II)

Day and Date : Thursday, 24-4-2014 Max. Marks : 100
Time : 11.00 a.m. to 2.00 p.m.

1. Answer in **one** sentence : **20**

   1) What is polycistronic mRNA ?
   2) What is the coordinated unit of genetic expression in bacteria called as ?
   3) Who discovered Transposable Elements ?
   4) Give an example for SINES.
   5) Name the model which explains Homologous Recombination.
   6) Write the Repeat sequence present in Human Telomeres.
   7) The following are the Melting Temperature for five DNA molecules :

      73°C, 69°C, 84°C, 78°C, 82°C

      Arrange these DNA in increasing order of percentage of GC pair.
   8) What does large cot $\frac{1}{2}$ value indicate ?
   9) Name the type of Transposition seen in Eukaryotes.
   10) What is the TM when G-C content is 35% ?
   11) Which Enzyme is called Molecular glue ?
   12) Name the Histone which is not part of Nucleosome.
   13) Which protein causes Termination of Transcription process ?
   14) Why is most promoter region A-T rich ?
   15) What is a Ribozyme ?
   16) What is the function of Release Factor ?
   17) What are the start and stop signals of Translation ?

P.T.O.

18) What is SOS Response ?

19) What is Chisequence ?

20) What is the Repetitive DNA ?

SECTION – I

2. Explain the role of Nuclear Matrix in Chromosome organization with its function.

OR

Explain the process of Replication in Eukaryotes with enzymes involved in Replication. **20**

3. A) Write **any one** of the following : **10**
   a) Heterochromatin and Euchromatin
   b) Non Homologous Recombination.

   B) Write short notes on **any two** of the following : **10**
   a) Cot curve analysis
   b) Enzymes involved in DNA Replication
   c) Buoyant Density.

SECTION – II

4. With a neat labeled diagram explain the process of Transcription in prokaryotes.

OR

Explain in detail about the Universal Genetic code and also Genetic code in Mitochondria. **20**

5. A) Write **any one** of the following : **10**
   a) Promoters
   b) Operon Concept.

   B) Write short notes on **any two** of the following : **10**
   a) Tryptophan operon
   b) Molecular Chaperons
   c) RNA Polymerases.

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SLR-VK – 11

Seat No.	

M.Sc. (Part – I) (Semester – II) Examination, 2014
BIOTECHNOLOGY (Paper – III)
Bioenergetics (Old)

Day and Date : Saturday, 26-4-2014 Total Marks : 100

Time : 11.00 a.m. to 2.00 p.m.

SECTION – I

1. Choose correct alternative. **10**

1) Rubisco is exclusively found in
   A) Mitochondrial stroma B) Chloroplast stroma
   C) Cytosol D) None of the above

2) _____ is called as interstitial cell stimulating hormone in males.
   A) Prolactin B) FSH
   C) Luteinizing hormone D) ACTH

3) Temperature coefficient (Q_{10}) for photosynthesis under normal condition is
   A) One B) Two C) Three D) Four

4) _____ of the following is steroidal hormone.
   A) Testosterone B) Growth hormone
   C) Thyroxine D) Dopamine

5) Which of the following is not required for photosynthesis ?
   A) CO_2 and H_2O B) Light
   C) Green plants D) None of the above

6) Photosynthesis is
   A) Catabolic process B) Anabolic process
   C) Amphibolic process D) None of the above

7) Reaction centre of pigment system I is
   A) P-680 B) P-690 C) P-700 D) All of above

8) Thyroxine is synthesized from _____ amino acid.
A) Alanine B) Tyrosine C) Tryptophan D) Lysine

9) C_4- pathway is also known as
A) C_4-dicarboxylic acid pathway B) Hatch-Slack pathway
C) Both A and B D) None of these

10) _____ occurs due to hypersecretion of growth hormone.
A) Acromegaly B) Gigantism C) Scurvy D) AIDS

2. Define and classify hormones. Give an account of adreno-corticotropic hormone. **20**

OR

2. Explain in details role of hormones in pregnancy and lactation. **20**

3. A) Give an account of cyclic photophosphorylation. **10**

B) Write short notes on the follows **(any two)** : **10**
1) Structure of chloroplast
2) Structure of ATP and ATP-ADP cycle
3) Hormonal regulation of spermatogenesis.

SECTION – II

4. Choose correct alternative. **10**

1) Prostaglandins are synthesized from
A) Oleic acid B) Arachidonic acid
C) Valeric acid D) None of these

2) Thyroid stimulating hormone act through _____.
A) cAMP B) cGMP C) cIMP D) cTMP

3) Ferredoxin (Fd) is a _____.
A) Non-heme iron protein B) Heme iron protein
C) Copper containing protein D) None of the above

4) Photosynthesis maintains equilibrium of which of the following gases in atmosphere ?
A) CO_2 B) O_2 C) N_2 D) All of above

5) Insulin is secreted by _____ Cells of pancreas.
A) Alpha cells B) Beta cells C) Delta cells D) PP cells

6) Which of the following hormone is involved in reabsorption of water form kidney ?
   A) Insulin B) Glucagon
   C) Vasopressin D) Growth hormone

7) Photolysis of water in photosynthesis requires the presence of _____
   A) Mn^{++} B) Mg^{++}
   C) Mn^{++} and Cl^{-} D) K^{+} and Cl^{-}

8) Auxin is mainly synthesized in ____.
   A) Roots B) Meristematic tissue
   C) Shoots D) None of the above

9) _____ is deficiency disorder of vassopressin.
   A) Diabetes mellitus B) Diabetes incipidus
   C) Acromegaly D) Dwarfism

10) Hypothyroidism causes _____
   A) Cretinism B) ARDS C) AIDS D) Leprosy

5. Discuss in details thyroid hormones with respect to chemical nature, synthesis and mechanism of action. Add note on its physiological effects. **20**

OR

5. Give account of **any two** of the following : **20**
   1) Nitrogenase energy complex
   2) Oxytocin
   3) Cytokinins.

6. Write short notes on the follows **(any four)** : **20**
   1) Phenoromones
   2) Physiological role of growth hormones.
   3) Nitrogen cycle
   4) Leghemoglobin
   5) Standard redox potential and its measurement.

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SLR-VK – 12

Seat No.	

M.Sc. (Semester – II) Examination, 2014
BIOTECHNOLOGY (Old)
Paper – IV : Tools and Techniques in Biosciences

Day and Date : Tuesday, 29-4-2014 Total Marks : 100
Time : 11.00 a.m. to 2.00 p.m.

1. Multiple choice questions : **20**

1) Radar stands for
   A) Radio detector and ranging B) Radio direction and ranging
   C) Radiation detector and ranging D) Radiation direction and ranging

2) In equation $CF = \omega^2 r$, 'ω' stands for
   A) Angular velocity B) Acceleration
   C) Momentum D) Density

3) The salts that are generally used for density gradient centrifuge include
   A) Sodium chloride B) Ammonium sulphate
   C) Cesium chloride D) Sodium hydroxide

4) The optimum strength of buffer used for electrophoresis should be
   A) 0.05 – 1 M B) 0.05 – 0.1 M C) 0.5 – 1 M D) 0.5 to 0.1 M

5) In native PAGE following is not used
   A) SDS B) Chlorine C) Glycinate D) All of these

6) Chromatography was discovered by Tswett in
   A) 1903 B) 1906 C) 1909 D) 1901

7) Gel filtration chromatography was discovered by
   A) J. Porath B) P. Flodin C) Both A and B D) Tswett

8) The basic principle of HPLC depends upon
   A) Stationary phase B) Mobile phase
   C) Both A and B D) None of these

P.T.O.

9) GC is _____ time faster than ordinary column chromatography.
A) 100 B) 1000 C) 10000 D) 500

10) Proteomics is widely done by which technique ?
A) 2D PAGE B) D PAGE
C) Agarose Gel electrophoresis D) NATIVE-PAGE

11) Who coined the term chromatography ?
A) Mikhail Tswett B) G.N. Lewis
C) Thomas Graham D) Zacharias Jensson

12) In a fluorescent microscope the objective lens is made of
A) Glass B) Quartz C) Polythene D) None of these

13) The resolution power of the compound microscope is
A) 0.2 micron B) 0.2 millimeters
C) 0.2 Angstrom units D) 0.2 centimeter

14) Electron Microscope was discovered by
A) Prof. Fritz B) Janssen and Hans
C) Knoll and Ruska D) None of these

15) What does the lens on a microscope do ?
A) Focus the image
B) Hold the slide
C) Change the amount of light passing through the microscope
D) Move the stage

16) The unit of radioactivity is
A) dps B) dpm C) Bq D) All of these

17) At pH above its isoelectric point proteins carry
A) Positive charge B) Negative charge
C) Both A and B D) Neutral

18) Proteins usually absorbed in the range of UV light because of following residue
A) Tyrosine B) Tryptophan
C) Both A and B D) Nitrogen group

19) Mass spectroscopy is widely utilized for
   A) To identify the structure of proteins
   B) To study protein expression
   C) To determine the proteins spots developed on 2D Gel
   D) All of these

20) MALD/ToF stand for
   A) Matrix Assisted Laser Destruction Time of Flight
   B) Mass Assisted Laser Desorption Time of Flight
   C) Matrix Assisted Laser Desorption Time of Flight
   D) Mass Assisted Laser Destruction Time of Flight

SECTION – I

2. Explain principle, theory and application of HPLC. **20**

OR

Explain the principle, methodology, instrumentation and application of UV-VISIBLE Spectrophotometer.

3. A) Enlist the various methods that are widely utilized for cell distruption. **10**

   B) Write notes on (**any two**) : **(2×5)**
   a) SDS
   b) Autoradiography
   c) Electro-endoosmosis.

SECTION – II

4. Explain principle, application and theory of Agarose gel electrophoresis. **20**

OR

Principle and application of Scanning Electron Microscopy.

5. A) Explain radioactive isotope and half life of isotope. **10**

   B) Write notes on (**any two**) : **(2×5)**
   a) Ethidium bromide
   b) RCF
   c) Application of IEC.

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SLR-VK – 13

Seat No.	

M.Sc. (Part – I) (Semester – II) (New) Examination, 2014
BIOTECHNOLOGY
(CGPA Pattern)
Cell Biology (Paper – I)

Day and Date : Tuesday, 22-4-2014 Total Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

Instructions** : 1) Part – **I**, question **1** is **compulsory.

*2) Attempt **any four** questions from Part – **II.***

*3) Figures to the **right** indicate **full** marks.*

*4) Answers to the Part – **I** and Part – **II** are to be written in same answer booklet only.*

PART – I

1.A) Rewrite the sentence after choosing the correct answer from the given alternatives : **7**

1) Plants differ from animals in that plants have _____

a) Mitochondria b) Chloroplast c) Vacuole d) Both b) and c)

2) Capsule is found in _____ cell.

a) Bacteria b) Plant c) Animal d) Actinomycetes

3) The major content of eukaryotic cell membrane is _____

a) Protein b) Carbohydrate c) Lipid d) Nucleic acids

4) _____ is involved in intracellular trafficking.

a) Ribosomes b) Golgi bodies c) Mitochondria d) Lysosomes

5) Tubulin protein is found in _____

a) Microfilament b) Lysosomes

c) Peroxisomes d) Mitochondria

6) Cell growth occurs in _____ phase.

a) Interphase b) Prophase

c) Metaphase d) Anaphase

7) _____ is one of the secondary messenger.

a) Hormone b) Cyclic AMP c) ATPase d) Sterol

B) Definitions : **7**

1) Plasmodesmata
2) Mesosomes
3) Rough Endoplasmic Reticulum
4) Cargo protein
5) Diffusion
6) CDKs
7) G-Protein.

PART – II

Answer **any four** of the following :

2. Explain in detail the structural organization of prokaryotic cell. **14**

3. Write a note on different models of cell membrane. **14**

4. Define microtubule. Add a note on its composition and assembly. **14**

5. Write a detailed note on types of cell division in eukaryotes. **14**

6. Answer **any two** from the following : **14**

   a) Add a note on types of cell signalling

   b) Explain the passive transport

   c) Write a note on cell adhesion and extracellular matrix.

7. Write short notes on **(any two)** : **14**

   a) Mitochondria
   b) Plant cell
   c) Calmodulin.

_____

SLR-VK – 14

Seat No.	

M.Sc. – (Part – I) (Semester – II) (New) Examination, 2014
BIOTECHNOLOGY (C.G.P.A Pattern)
Paper – II : Enzyme Technology

Day and Date : Thursday, 24-4-2014 Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions *: 1)* ***All*** *question of Part –* ***I*** *are* ***compulsory****.*
2) Answer ***any four*** *questions from Part –* ***II****.*
3) ***All*** *questions carry* ***equal*** *marks.*
4) Draw ***neat*** *and labelled diagrams* ***wherever*** *necessary.*

PART – I

1. A) Rewrite the following sentences by choosing the most correct alternative given below : **7**

i) The graphical representation of effect of temperature on activity of enzyme gives _____ shape.

a) bell b) parabolic
c) hyperbolic d) sigmoidal

ii) In _____ inhibition the Vmax of enzyme remains constant but Km increases.

a) Non-competitive b) Mixed type
c) Uncompetitive d) Competitive

iii) The catalysts enhance reaction rates by lowering _____ energies.

a) activation b) binding
c) Gibb's free d) free

iv) Protein ligand interaction can be determined by _____ plot.

a) Scatchard b) Hill
c) Lineweaver burk d) Eadie-Hofstee

v) In covalent bonding _____ is bonding between the amino group of the support and a tyrosyl or histidyl group of the enzyme.

a) cross linking b) group activation
c) diazoation d) peptide bond

P.T.O.

vi) $Na^+ – K^+$ ATPase pumps _____ Na^+ outside cytosole and _____ K^+ inside the cytosole.

a) 3, 3 b) 2, 2 c) 3, 2 d) 2, 3

vii) In Eadie-Hofstee alternative plot in enzymology the Y-intercept indicates _____

a) $\frac{Vmax}{Km}$ b) $\frac{Km}{Vmax}$ c) Km d) Vmax

B) Define the following terms : **7**

i) Enzyme engineering
ii) Scatchard plots
iii) Activation energy
iv) Uncompetitive inhibitor
v) Turnover number
vi) Modulators
vii) Abzymes.

PART – II

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

2. Explain the cooperativity concept with its quantitative measurement. And a note on models to explain cooperativity. **14**

3. Describe in detail the bisubstrate reactions with its types and kinetics. **14**

4. Illustrate the factors affecting the efficiency of the enzyme. **14**

5. Write an essay on metabolic engineering. **14**

6. Answer **any two** of the following : **14**
   a) Derive Michaelis-Menten. Add a note on significance of Km and Vmax.
   b) Describe in detail the characteristics of enzyme.
   c) Explain the structural and functional relationship of carboxypeptidase.

7. Answer **any two** of the following : **14**
   a) Write a note on allosteric regulation of enzymes.
   b) Describe the structural and functional relationship of phosphorylase.
   c) Discuss the practical and economic advantages of immobilized enzymes in industries.

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SLR-VK – 15

Seat No.	

M.Sc. (Part – I) (Semester – II) Examination, 2014
BIOTECHNOLOGY
(C.G.P.A. Pattern) (New)
Molecular Cell Processing (Paper – III)

Day and Date : Saturday, 26-4-2014 Total Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

Instructions *: 1) Part – **I**, Question **1** is **compulsory**.*

*2) Attempt **any four** questions from Part – **II.***

*3) Figures to the **right** indicate **full** marks.*

*4) Answers to the Part **I** and Part – **II** are to be written in **same** answer booklet only.*

PART – I

1. A) Rewrite the sentence after choosing the correct answer from the given alternatives : **7**

1) How many stop codons are there in the genetic code ?
a) 2 b) 3 c) 4 d) 5

2) _____ statements is true of DNA damage.
a) Most DNA damage is repaired by the cell
b) All DNA damage results in diseases such as cancer
c) All DNA damage is caused by physical, chemical or biological agents
d) Most DNA damage is advantageous to the cell

3) What is the role of topoisomerases in eukaryotic DNA replication ?
a) Topoisomerise enzymes cut, uncoil and reseal the double stranded DNA
b) Topoisomerise enzymes bind to the origin of replication sites within double stranded DNA
c) Topoisomerise enzymes open up the double stranded DNA at the replication fork
d) Topoisomerise enzymes join the Okazaki fragments together with phosphodiester bonds

4) _____ RNA required for protein synthesis.
   a) tRNA b) mRNA c) rRNA d) All of these

5) Sigma factor is a component of
   a) DNA ligase b) DNA polymerase
   c) RNA polymerase d) Endonuclease

6) In prokaryotes, the first amino acid in the polypeptide chain is
   a) Methionine b) N-formyl methionine
   c) Glycine d) Serine

7) During the process of transcription, _____ of the following is produced.
   a) H_2O b) ATP c) mRNA d) DNA

B) Definitions: **7**

1) Polyadenylation
2) Holiday intermediate
3) Group II introns
4) 30S Ribosome
5) Uvr A, Uvr B and Uvr C
6) Topoisomer
7) rec BCD pathway.

PART – II

Answer **any four** of the following :

2. What is replication fork ? Explain the eukaryotic DNA replication with neat labeled diagram. **14**

3. Explain the process of RNA editing with neat labeled diagram. **14**

4. Write a note on base excision and recombination repair with neat labeled diagram. **14**

5. What are translation initiation factors ? Describe the process of translation and add a note on translation inhibitors. **14**

6. Answer **any two** from the following : **14**
   a) Explain the eukaryotic RNA polymerases.
   b) Write a note on different repair enzymes.
   c) Write a note on different types of RNA molecules.

7. Write short notes on (**any two**): **14**
   a) *E.Coli* DNA Pol I
   b) Eukaryotic gene structure
   c) Promoter elements, Activators, Enhancers and Repressors.

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SLR-VK – 16

Seat No.	

M.Sc. (Part – I) (Semester – II) Examination, 2014
BIOTECHNOLOGY
(C.G.P.A. Pattern) (New)
Paper – IV : Immunology and Immuno Techniques

Day and Date : Tuesday, 29-4-2014 Total Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

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

PART – I

1. A) Select appropriate answer form the following and rewrite. **7**

1) _____ received Nobel Prize for Transplantation immunology.
   a) Cesar Milstein and Georges F Kohler
   b) F. Macharlane Burnet and Peter Medawar
   c) Rodney R Porter and Gerald M Edelman
   d) E. Donnall Thomas and Joseph Murry

2) After a T_H cell recognizes and interact with an antigen MHC complex, the cell is activated – it becomes an effector cell that secretes various growth factors known collectively as _____.
   a) macrophages b) mitogens
   c) cytokines d) cytotoxic T-lymphocytes

3) Main genetic region of the major histocompatibility complex in human is located on _____ chromosomes.
   a) 17 b) 10 c) 5 d) 6

4) The reaction of multivalent antigen with the heterogeneous mixture of antibodies is an antiserum is defined by ____
   a) specificity b) affinity c) avidity d) sensitivity

5) _____ a gammaglobulin that can activate complement is found to exert haemolytic, bactericidal and virucidal action.
   a) Cathelicidins b) Properidin
   c) Dermicidin d) Prostaglandins
6) The first step in antigen processing is the degradation of protein by 26s proteosome. To ensure the proteosome degrades it is tagged by ____
   a) conjugate b) proteins
   c) liposomes d) ubiquitination
7) RIA is a serodiagnostic test whose sensitivity is _____.
   a) milligrams b) picograms
   c) nanograms d) micrograms

B) Definition : **7**

1) ELISA
2) Cancer Immunology
3) Endocytic pathways
4) CMI
5) Mitogens
6) Interferon
7) Attenuated vaccines.

PART – II

Answer **any four** of the following.

2. What is Innate immunity. Explain 1st and 2nd line of defense. **14**

3. Give a brief account on cytokines- cytokines secreted by T_H1 AND T_H2 AND its regulation. **14**

4. Write an essay on Viral diseases. **14**

5. Give a brief account on Hypersensitivity types and general mechanism of hypersensitivity. **14**

6. Answer **any two** form the following : **14**
   A) DNA vaccines.
   B) Structure of Antibodies.
   C) *Mycobacterium tuberculosis*.

7. Write short notes on **(any two)** : **14**
   A) Give brief account on clonal selection theory.
   B) Explain briefly the immune response to tumor antigens.
   C) Write short notes on complement fixation test.

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SLR-VK – 17

Seat No.	

M.Sc. (Part – II) (Semester – III) Examination, 2014
BIOTECHNOLOGY
Genetic Engineering (Paper – I)

Day and Date : Monday, 21-4-2014 Total Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

Instructions *: 1) Section **I** is **compulsory**.*
*2) From Section **II** attempt **any four**.*
*3) Figures to **right** indicate **full** marks.*
*4) Answers to the Section **I** and Section **II** should be written in the **same** answer book.*

SECTION – I

1. A) Rewrite the following sentences by using correct alternative : **10**

1) RFLP is
   a) Bacteriophage vector for cloning DNA
   b) Genetic disease
   c) Plasmid vector for cloning DNA
   d) Variation in DNA base sequence

2) Introduction of DNA into cells by exposing to high voltage electric pulse is _____
   a) Electrofusion b) Electrofision
   c) Electrolysis d) Electroporation

3) The PCR technique was developed by _____
   a) Kary Mullis b) Kohler c) Milstein d) Altman

4) DNA solution injected directly into the cell using micromanipulators is called _____
   a) Macroinjection
   b) Micromanipulator mediated DNA delivery
   c) Microfection
   d) Microinjection

P.T.O.

5) Single stranded unpaired extensions formed by restriction enzymes upon cleavage is known as _____

a) Blunt ends b) Flush ends

c) Sticky ends d) Cos ends

6) Bt cotton is obtained by inserting genes from _____

a) Bacillus tumefaciens b) Bacillus thuringiensis

c) Bacillus phyphoideum d) Bombyx toxin

7) PCR is used to _____

a) Amplify gene of interest

b) Construct RAPD maps

c) Detect the presence of transgene in an organism

d) All of these

8) First strand cDNA synthesis requires _____

a) tDNA ligase b) Reverse transcriptase

c) Klenow enzyme d) E. Coli DNA polymerase

9) In Maxam and Gilbert sequencing method, chemicals used for degradation of C are _____

a) Urea b) Feramide

c) Hydrazine d) DMS

10) Cosmid vectors are used for _____

a) Cloning small fragments of DNA

b) Cloning large fragments of DNA

c) Cloning prokaryotic DNA only

d) Cloning eukaryotic DNA only

B) Answer **any five** of the following terms : **10**

1) Plasmid

2) Neoschizomers

3) siRNA

4) Gene silencing

5) Knockout mice

6) Cloning vectors
7) Transformation
8) Adaptors
9) rDNA Technology
10) Probes.

SECTION – II

Attempt **any four** :

2. Explain in detail nucleic acid hybridization technology. Add a note on its applications. **20**

3. Write an essay on expression vectors. **20**

4. Describe in detail DNA sequencing methods. **20**

5. Answer **any two** : **20**
   A) Give an account on artificial chromosome vectors.
   B) Describe in detail micro RNA technology.
   C) Explain construction of cDNA library in lambda vector.

6. Answer **any four** : **20**
   1) Germ line therapy
   2) Site directed mutageneis
   3) Somatic cell fusion
   4) Methyl interference assay
   5) Retroviral vectors
   6) FISH.

SLR-VK – 18

Seat No.	

M.Sc. (Semester – III) Examination, 2014
BIOTECHNOLOGY (Paper – II)
Immunology

Day and Date : Wednesday, 23-4-2014 Max. Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) Question **1** is **compulsory**.*
*2) Answer to Section **I** and **II** are to be written in **separate** answer books.*
*3) Figures to **right** indicate **full** marks.*

1. 1. The HIV genome consists of _____, which are associated with two molecules of reverse transcriptase.
   a) one copy of ssRNA b) two copies of ssRNA
   c) one copy of dsRNA d) two copies of dsRNA
   2) In the HIV gp120 is associated with _____ and serves as the viral receptor for CD4 on host cell.
   a) gp41 b) p32 c) p24 d) p17
   3) In HIV infection, _____ drug act as nucleoside analog which is inhibitor of reverse transcriptase.
   a) Ritonavir b) Nelfinavir
   c) Zidovudine (AZT) d) Nevirapine
   4) Mature B cell, which has not previously encountered antigen is called _____
   a) Plasma cell b) Pre B-cell
   c) Pro B-cell d) Naive B cell
   5) In the Humoral immunity, interaction of CD40 and CD40L provides signal 2nd, while _____ interaction will provide co-stimulation to the TH cell.
   a) MHC-TCR b) BCR-TCR
   c) BCR-TLR4 d) B7-CD28

6) In CMI, _____ will perform role in target cell killing.
   a) perforins b) granzymes
   c) fragmentins d) all of these

7) Cytotoxic T Lymphocytes (CTLs) will kill target cell by using _____ pathway.
   a) Fas b) Perforin/Granzyme
   c) Both d) None

8) In the Humoral immunity, interaction of CD40 and CD40L provides signal 2nd, while _____ interactions provide co-stimulation to TH cells.
   a) MHC-TCR b) BCR-TCR
   c) BCR-TLR4 d) B7-CD28

9) In the cell-mediated immunity, Cytotoxic T Lymphocyte (CTL) cell forms conjugate with self-altered cell (Target cell), in which the CTL programs the target cell for death; this is the energy-requiring and _____ dependent process.
   a) Mg^{++} b) Ca^{++} c) Na^{++} d) K^{+}

10) Daily injection of recombinant _____ have been shown to induce partial or complete tumor regression in some patients with leukemias, lymphomas, melanoma, Kaposi's sarcoma, renal cancer and breast cancer.
   a) INF-γ b) INF-β c) INF-α d) IL-6

11) Tumor-infiltrating lymphocytes (TILs) shows antitumor response and can be expanded (multiplied) in vitro with _____
   a) IL-2 b) IL-4 c) IL-6 d) IL-8

12) 'Magic Bullets' are immunotoxins, which are used for killing of _____ cells without harming normal cells.
   a) Tumor b) B c) T d) NK

13) Leukemia typing is carried by _____
   a) RIA b) ELISA
   c) Electron microscopy d) Flow cytometry

14) FACS works with _____
   a) Flow cytometry b) Fluorescence
   c) Both of these d) None of these

15) In the AIDS patient, CD4:CD8 count is taken by using _____
   a) Flow cytometry b) Complement fixation test
   c) Immunofluorescence d) Electronmicroscopy

16) Poison oak leaves contain pentadecacatechol, which alter the skin self-proteins, hence it will result into _____ hypersensitivity.
   a) Antibody dependent b) IgE dependent
   c) Delayed type d) Immune-complex mediated

17) Erythroblastosis fetalis, hemolytic disease of the newborn is caused by _____ hypersensitivity.
   a) Type I b) Type II c) Type III d) Type IV

18) Serotonin, primary mediator of Anaphylaxis is formed by decarboxylation of _____
   a) alanine b) histidine
   c) lysine d) tryptophan

19) Iron-binding protein present (lactoferrin) present in mucous has _____ ability.
   a) antigen presentation b) microbial growth inhibition
   c) immune suppression d) phagocytosis

20) In the antigen presentation by Exogenous pathway a non-classical class II MHC molecules called _____ are required to catalyze the exchange of CLIP with antigenic peptides.
   a) HLA-DP b) HLA-DM c) HLA-DQ d) HLA-DO

SECTION – I

2. a) Describe in detail about classical pathway of complement fixation. **12**
   b) Write a note on active and passive immunization. **8**

OR

2. a) Give an account antigen presentation by MHC I. **10**
   b) Differentiate between innate and acquired immunity. **10**

3. Write short notes on (**any four**) : **20**
   1) Antibody diversity
   2) Antigen and their types
   3) Synthetic peptide vaccines
   4) Role of adjuvants with examples
   5) Phagocytosis.

SECTION – II

4. Write notes **any two** of the following : **20**
   1) Write a note on graft rejection and tissue typing.
   2) Causes of autoimmune disorders.
   3) Type I hypersensitivity with suitable examples.

OR

4. Write notes **any two** of the following : **20**
   1) Immunoelectrophoresis
   2) Development of vaccines
   3) ELISA and their types.

5. Write short notes on (**any four**) : **20**
   1) Immunosuppressive therapy
   2) RIA
   3) SCID
   4) AIDS
   5) Hybridoma technology.

SLR-VK – 21

Seat No.	

M.Sc. (Biotechnology) (Semester – IV) Examination, 2014
ANIMAL CELLS IN BIOTECHNOLOGY (Paper – I)

Day and Date : Tuesday, 22-4-2014 Total Marks : 100
Time : 3.00 p.m. to 6.00 p.m.

***Note** : 1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicate marks.*
*3) Draw diagrams **wherever** necessary.*

1. Answer the following in **one** sentence. **20**
   1) What is split ratio ?
   2) Name the widely used embryonic stem lines.
   3) What is scale-up ?
   4) What is the advantages of use of microbeads in monolayer cultures ?
   5) In embryonic stem cells which cells of embryo are used ?
   6) Which technique is used to detect the apoptosis in culture ?
   7) What is cell viability ?
   8) Define cytotoxicity.
   9) What is inhibitory concentration of drugs ?
   10) In dye exclusion assay, the percentage of unstained cells represents which type of cells ?
   11) Which technique is used for measuring the survival of cells ?
   12) What is MTT ?
   13) What is HAT ?
   14) Define sparging.
   15) What is BSS ?
   16) What is anchorage dependent growth ?
   17) Define finite cell line.
   18) What is clone ?
   19) Name two enzymes commonly used for disaggregation.
   20) What is microcarrier ?

P.T.O.

SECTION – I

2. Give an account of different types of cell types and cell lines. How can you obtain a cell line from cultured cells ? Discuss. **20**

OR

Describe briefly the procedure used for animal cell and tissue culture. How will you sterilize the equipments and the components of media ?

3. A) Describe the technique of somatic cell fusion and the development of hybridoma clones. **10**

B) Write short notes on (**any two**) : **10**

1) Differentiated cells
2) Plasma clots
3) Serum free media.

SECTION – II

4. Describe the utility of large scale cell cultures for production of

a) SCP
b) vaccines
c) interferons
d) monoclonal antibodies. **20**

OR

What is tissue engineering ? Discuss its achievements with suitable examples.

5. A) What is laparoscopy ? Describe the equipment and the technique of laparoscopy for oocyte recovery. **10**

B) Write short notes on following (**any 2**) : **10**

1) Single cell protein
2) hCG
3) MCB (Master Cell Banks) and MWCB (Master Working Cell Banks).

SLR-VK – 22

Seat No.	

M.Sc. – II (Semester – IV) Examination, 2014
BIOTECHNOLOGY
Paper – II : Industrial and Environment Biotechnology

Day and Date : Thursday, 24-4-2014 Max. Marks : 100

Time : 3.00 p.m. to 6.00 p.m.

N. B. *: 1) Question **1** is **compulsory**.*
*2) **All** questions carry **equal** marks.*
*3) Figures to the **right** indicate **full** marks.*
*4) Answer to Section **I** and **II** are to be written in **separate** answer books.*

1. Rewrite the following sentence by choosing the appropriate answer : **20**

1) _____ is NOT an example of xenobiotic compound.
a) DDT b) Cyclohexane
c) PCB d) Bioplastics

2) Cell wall synthesis in bacterial cell is inhibited by _____ antibiotic.
a) Cephalosporin b) Tetracycline
c) Streptomycin d) Chloramphenicol

3) Giant colony technique is an example of _____ screening.
a) Primary b) Secondary
c) Tertiary d) Quaternary

4) 6-APA stands for _____
a) 6-Amino Pimelic Acid b) 6-Amino Penicillianic Acid
c) 6-Aceto Penicillianic Acid d) Both b) and c)

5) _____ brings about the changes in water with regard to its colour, odour, density, taste, turbidity and thermal properties.
a) Physiological pollution b) Physical pollution
c) Biological pollution d) Both a) and b)

6) _____ is the most commonly used method of dye removal by adsorption.
a) Activated carbon b) Peat
c) Wood chips d) All of these

7) The precursor molecule found in corn steep liquor for penicillin fermentation is _____
   a) Phenoxyacetic acid b) Butane acetone
   c) Molasses d) Both a) and b)

8) For production of citric acid, _____ medium is mostly preferred.
   a) Presscots b) White
   c) BSS d) MS

9) A compound that is foreign in nature to biological systems is known as a _____
   a) Antibiotics b) Bioplastics
   c) Biofertilisers d) Xenobiotics

10) World Environment Day is on_____
   a) 5th June b) 5th July
   c) 5th August d) 5th May

11) _____ is NOT an example of biofertilisers in Agrosystems.
   a) Azolla-Anabaena b) Azospirillum
   c) Rhizobia-Cactus d) Mycorrhizal fungi

12) Patent is the composition of _____
   a) Acrediation, Claim and Grant
   b) Grant, Reacrediation and Claim
   c) Speciation, Acrediation and Claim
   d) Grant, Speciation and Claim

13) SCP stands for _____
   a) Single Cell Performance
   b) Single Callus Protein
   c) Single Cell Particle
   d) Single Cell Protein

14) A.M. Chakrabarty had sought a patent for a _____ which is capable of treating oil spills.
   a) E. coli strain
   b) Pseudomonas strain
   c) E. coli 18 strain
   d) Pseudomonas 32B strain

15) $Ca(OH)_3$ and dil. HCl are used in combination for _____ step of citric acid recovery.
a) Drawing b) Flocculation
c) Filtration d) Crystallisation

16) PHB means _____
a) Polyhydroxy butane
b) Polyhydroxy butyrate
c) Phenohydroxy butyrate
d) Phenolhydroxy butyrate

17) In fermenter, spargers are used to provide _____
a) Sterile air b) Sterile nutrients
c) Proper agitation d) Mixing of nutrients

18) Bioreactors are used to cultivate _____
a) Prokaryotic cells only
b) Eukaryotic cells only
c) Both a) and b)
d) Viruses only

19) The most widely produced microbial bioplastics are_____
a) PHB b) PHA
c) PCB d) Both a) and b)

20) The general use of plants to remediate environmental media in situ is called as _____
a) Bioremediation b) Phytoremediation
c) Bioaugmentation d) Biomagnification

SECTION – I

2. What are steroids ? Describe in detail about the types of reaction involved during biotransformation and their application. **20**

OR

2. a) Discuss in detail about various concepts of media optimization for industrial fermentation. **10**

b) What are the essential criteria for the development of inoculum for industrial fermentation ? **10**

3. Explain the following :
   a) Microbial leaching and their applications. **10**
   b) Amino acids production. **10**

OR

3. Write short notes on **(any four)** : **20**
   1) Glutamic acid production.
   2) SCP.
   3) Reactions involved in Biotransformation.
   4) Synthetic matrix used for immobilization study.
   5) Strategies used for purification of enzymes.

SECTION – II

4. a) The utilization of VA Mycorrhizal (VAM) fungi for crop production. **10**
   b) Discuss intellectual Property Right (IPR) available for plant breeder's right. **10**

OR

4. What is environment pollution ? Give their types and biotechnological control measurements in detail. **20**

5. What is anaerobic treatment process ? Briefly describe the methods of anaerobic treatment of wastewater and sewage sludge. **20**

OR

5. Write short notes on **(any four)** : **20**
   1) Significance of hybridoma technology
   2) WIPO
   3) Biochips
   4) Bioinsecticides
   5) Trickling filters.

SLR-VK – 23

Seat No.	

M.Sc. II (Semester – IV) Examination, 2014
BIOTECHNOLOGY
Bioinformatics (Paper – III)

Day and Date : Saturday, 26-4-2014 Total Marks : 100

Time : 3.00 p.m. to 6.00 p.m.

***Instructions** : 1) Question **1** is **compulsory**.*

*2) Section **I** and **II** should be written in **separate** answer books.*

*3) Figure to the **right** indicates **full** marks.*

1. Multiple Choice. **20**

1) PDB ID contains _____ code letters.
   a) Three b) Four c) Five d) Six

2) Clustal W tool is used in
   a) Phylogenetic analysis b) Secondary structure prediction
   c) Measurement of dihesdral angles d) None

3) Ramachandran plot maps _____ space of peptide.
   a) Conformational b) Rotational
   c) Structural d) Planar

4) An example of aromatic amino acid is
   a) Proline b) Histidine c) Valine d) Phenylalanine

5) Alpha helices and beta sheets are getting formed in _____ structures.
   a) tertiary b) secondary c) primary d) none

6) PAM means
   a) Point Accepted Mutation b) Point Altered Mutation
   c) Point Automated Mutation d) Point Attracted Mutation

7) EST means
   a) Expressed Sequence Tags b) Enzyme Sequence Tags
   c) Exected Sequence Tags d) Extracted Sequence Tags

8) _____ is a spectroscopic technique.
   a) MALDI-TOF b) BioEdit c) AutoDock d) ELISA

9) UPGMA is
   a) DOT matrix b) Server
   c) Phylogenetic tree method d) Scoring matrices

10) CDS means
   a) Conserved domains b) Coding sequences
   c) Both a and b d) None

11) The Needleman-Wunsch algorithm is used in _____ type of alignment.
   a) Global b) Local c) Heuristic d) All

12) DDBJ is situated in
   a) USA b) England c) China d) Japan

13) Aspartate is an example of _____ amino acid.
   a) Acidic b) Basic c) Aliphatic d) Aromatic

14) PubMed is _____ database.
   a) Structural b) Protein c) Literature d) None

15) Human genome project was completed in
   a) 2008 b) 2003 c) 2001 d) 1998

16) ESI means
   a) Electro Spray Ionization b) Electro Spray Induction
   c) Electro Spray Inhibition d) All of these

17) A biological retrieval system used by NCBI is
   a) SRA b) FASTA c) ENTREZ d) OMIM

18) _____ tool is used in Phylogenetic analysis.
   a) DASTY b) BLAST c) PHYLIP d) PANDIT

19) REBASE means
   a) Repository for restriction enzyme
   b) Resource for restriction enzymes
   c) Region for restriction enzyme
   d) None

20) GenBank is _____ sequence database.
   a) nucleotide b) lipid c) protein d) modular

SECTION – I

2. What is Phylogenetic tree ? Discuss various phylogenetic methods in detail. **20**

OR

2. Define molecular modeling. Discuss various energy minimization methods. **20**

3. A) Write short answer **(any one)**. **10**
   a) Conformational search
   b) Secondary protein sequence database.

   B) Write short notes **(any two)**. **10**
   a) Applications of BioEdit
   b) Alpha helix
   c) UTR.

SECTION – II

4. Discuss various blast programmes in detail. **20**

OR

4. What is database ? Explain primary protein sequence databases in detail.

5. A) Write short answer **(any one)**. **10**
   a) Gene Identification methods
   b) Protein folding classes.

   B) Write short answer **(any two)**. **10**
   a) Peptide Fingerprinting
   b) PDB
   c) Applications of microarray technology.

SLR-VK – 24

Seat No.	

M.Sc. (Part – II) (Semester – IV) Examination, 2014
BIOTECHNOLOGY
Paper – IV : Microbial Fermentation Technology

Day and Date: Tuesday, 29-4-2014 Total Marks : 100

Time: 3.00 p.m. to 6.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory*** *and carry* ***equal*** *marks.*
2) Section ***I*** *and* ***II*** *should be written in* ***separate*** *answer books.*

1. Multiple choice questions : **20**

i) GA stands for

A) Genetic Analysis B) Genetic Algorithm

C) Gene Analysis D) Gene Algorithm

ii) The majority of metabolites are produced during _____ phase of growth.

A) lag B) exponential C) stationary D) death

iii) What is the temperature of liquid nitrogen ?

A) –190° C B) –150° C C) –156° C D) –196° C

iv) The moist heat is more effective than dry heat because the intrinsic heat resistance of vegetative cell is greatly

A) increased in a dry state B) decreased in a dry state

C) increased in a wet state D) decreased in a wet state

v) The filter material used for air filtration system is/are

A) glass wool B) glass fiber C) norite D) all of the above

vi) The net ATP production in glycolytic pathway is

A) 1 B) 8 C) 2 D) 4

vii) The recombination is widely used for

A) innoculum development B) strain improvement

C) strain preservation D) mutation

P.T.O.

viii) Which of the following is used as cryoprotectant ?

A) glycerol B) DMSO

C) both A and B D) none of the above

ix) MBT is abbreviated as

A) Microbial Bio Technology B) Microbial Biology and Technology

C) Mass Balance Transfer D) Mass Balance Transport

x) In which phase of growth, starved proteins are synthesized ?

A) log B) lag C) stationary D) death

xi) If an organism multiplies in 90 minutes and you have taken the innoculum of cell density of 10 cells/ml, calculate the cell density of the same organism after 12 hours

A) 1280 cells/ml B) 640 cells/ml

C) 2560 cells/ml D) 960 cells/ml

xii) The specific death rate of an organism can be expressed as

A) ln2/D B) D/ln2 C) D × ln2 D) 2.303/ln2

xiii) Which of the following would be best described as an axial flow impeller ?

A) an impeller with blades pitched at 45 to the vertical

B) an impeller which directs liquid flow towards the base of the reactor

C) both A and B

D) an impeller with blades pitched at 75 to the vertical

xiv) The manufacturing cost of product depends upon

A) upstream processing B) downstream processing

C) both A and B D) none of the above

xv) A culture system with constant environmental conditions maintained through continuous supply of the nutrients and removal of the waste is called _____ culture system.

A) batch B) fed-batch C) continuous D) semi-continuous

xvi) The micro-filtration refers to the separation of suspended material such as bacteria using membrane with pore size of

A) 0.02 – 10 μm B) 1 – 10 μm C) 20 – 30 μm D) 10 – 200 μm

xvii) The organisms growing in a chemostat, the specific growth rate

A) cannot be determined

B) can be determined from the dilution rate

C) equals to the maximum specific growth rate of the culture

D) none of the above

xviii) The antibiotics are generally _____ metabolites.

A) primary B) secondary

C) both A and B D) none of the above

xix) 121° C temperature is widely preferred for

A) autoclaving B) dry heat sterilization

C) lyopholization D) pasteurization

xx) Which fungus is widely used for alcohol fermentation ?

A) A. niger B) *P. notatum*

C) *S. cerevisiae* D) *C. albicans*

SECTION – I

2. Give a detail account of various screening procedures used for isolation of industrially important microbes. **20**

OR

2. Describe the methodology used for optimization of medium in detail with suitable example. **20**

3. A) Write notes on (**any one**) : **10**

i) Biosensor.

ii) Construction and working of tower fermenter.

B) Write short notes on (**any two**) : **(5×2)**

i) Artificial neural network

ii) Baffles

iii) Oxygen and mass balance.

SECTION – II

4. Give a detail account of various techniques used for strain improvement. **20**

OR

4. Describe the rheological properties of the fermenter. **20**

5. A) Write notes on (**any one**) : **10**
   i) Batch Vs Continuous fermentation
   ii) Mathematical modelling.

   B) Write short notes on (**any two**) : **(5×2=10)**
   i) Maintenance and preservation cells.
   ii) Knowledge based system.
   iii) Acetators and Cavitators.

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SLR-VK – 5

Seat No.	

M.Sc. (Part – I) (Semester – I) (New) Examination, 2014
BIOTECHNOLOGY
Microbiology (Paper – I) (C.G.P.A. Pattern)

Day and Date : Monday, 21-4-2014 Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

N.B. *: 1) Section – **I** is **compulsory**.*
*2) From Section – **II** attempt **any four**.*
*3) **All** questions carry **equal** marks.*
*4) Figures to the **right** indicate **full** marks.*
*5) Draw **neat** and labelled diagram.*

SECTION – I

1. A) Complete the sentences by selecting correct answer from given alternatives : **7**

i) Extreme halophiles grow in conditions containing high amounts of _____

a) nitrogen b) oxygen
c) salt d) carbon

ii) _____ method used to amplify short fragments of DNA.

a) DNA hybridization b) Southern blotting
c) Cloning d) Polymerase chain reaction

iii) The base composition of organisms is generally stated in terms of _____

a) A – T content b) G – C content
c) A – G content d) C – T content

iv) Extremozymes are present in _____

a) Halophiles b) Thermoacidophiles
c) Methanogens d) Barophiles

v) The nucleic acid of polio virus is _____

a) DNA b) RNA type
c) SS DNA d) SS RNA + type

P.T.O.

vi) In Archaea _____
   a) Cell wall with muramic acid
   b) Membrane lipids are ether linked
   c) Cell wall with mycolic acid
   d) Cell membrane with phospholipid

vii) _____ event occurs in prokaryotes but not in eukaryotes.
   a) Protein phosphorylation
   b) Formation of okazaki fragment
   c) Control of transcription by attenuation
   d) RNA polymerase and promoter interaction

B) Define the following : **7**
   i) Thermoacidophilus
   ii) Numerical taxonomy
   iii) Nomenclature
   iv) Methanogenic bacteria
   v) Acidophilic organisms
   vi) Barophiles
   vii) Type strain.

SECTION – II

Attempt **any four** :

2. Write an essay on “Cultivation of animal viruses by using tissue culture”. **14**
3. Explain “Criteria for bacterial classification”. **14**
4. Discuss in detail photodynamic inactivation of viruses by physical agents. **14**
5. Comment on “Enumeration of viruses by end point method”. **14**
6. Write short notes on (**any two**) : **14**
   A) Lytic cycle in T_4 phage
   B) Reproduction of TMV
   C) Animal inoculation.
7. Answer **any two** : **14**
   A) Hepatitis B virus
   B) General outline of polyphasic taxonomy
   C) Anoxygenic photosynthetic microbes.

_____

SLR-VK – 6

Seat No.	

M.Sc. (Part – I) (Semester – I) (New) Examination, 2014
BIOTECHNOLOGY (CGPA Pattern)
Biomolecules and Bioenergetics (Paper – II)

Day and Date : Wednesday, 23-4-2014 Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

***Instructions** : 1) **All** questions of Section – **I** are **compulsory**.*
*2) Answer **any four** questions from Section – **II**.*
*3) **All** questions carry **equal** marks.*
*4) **Draw** neat and labelled diagrams **wherever** necessary.*

SECTION – I

1. A) Rewrite the following sentences by choosing the most correct alternative given below : **7**

i) The location of dark reaction of photosynthesis is at _____ of chloroplast.
a) Grana b) Thylakoid
c) Stroma d) Intermembrane space

ii) The final electron acceptor in oxidative phosphorylation is _____
a) Oxygen b) Water
c) Carbon dioxide d) Carbon monoxide

iii) The hormone mineralocorticoid is secreted from _____ gland.
a) Pancreas b) Thyroid c) Adrenal d) Parathyroid

iv) Amongst the following _____ is not a part of nitrogen cycle.
a) Nitrate reduction b) Ammonification
c) Nitrogen fixation d) Transamination

v) Stoichiometry of proton extrusion and uptake one NADH is equals to _____ ATP molecules.
a) 1 b) 1.5 c) 2 d) 2.5

vi) All free living diazotrophs repress *nif* gene transcription when _____ level is high.
a) Free nitrogen gas b) Oxygen
c) Pyruvate d) NADH

vii) The responsible for stem elongation in plants is _____
a) Auxin b) Gibberellins c) Abscisic acid d) Cytokinins

B) Define the following terms : **7**

i) Hill's reaction
ii) Redox couple
iii) Spermatogenesis
iv) *Nif* genes
v) Bacteriorhodopsin
vi) Respiratory controls
vii) Hormones.

SECTION – II

Answer **any four** :

2. Describe in detail the electron transport chian in mitochondria. Add a note on inhibitors of electron transport chain. **14**

3. Write an essay on cell surface and intracellular receptors of hormone. Add a note on secondary messengers. **14**

4. Explain in detail about nitrogenase enzyme complex with their activity. Add a note on assimilation of ammonia. **14**

5. Discuss in detail about the C_4 pathway. Add a note on photorespiration. **14**

6. Answer **any two** of the following : **14**
   a) Write a note on light harvesting complex in green plants.
   b) Discuss in detail about pheromones.
   c) Explain in detail the symbiotic and non-symbiotic nitrogen fixation.

7. Answer **any two** of the following : **14**
   a) Describe in detail ATP synthetase complex and ATP generation.
   b) Explain in detail the phosphate group transfer potential.
   c) Write a note on hormonal control on lactation.

———————

SLR-VK – 7

Seat No.	

M.Sc. – I (Semester – I) (New) Examination, 2014
BIOTECHNOLOGY
Inheritance Biology (Paper – III)
(CGPA Pattern)

Day and Date : Friday, 25-4-2014 Total Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

Instructions *: 1) Section **I** is **compulsory**.*
*2) From Section **II** attempt **any four**.*
*3) **All** questions carry **equal** marks.*
*4) Figures to **right** indicate **full** marks.*
5) Draw neat and labelled diagrams.

SECTION – I

1. A) Rewrite the following sentences by using correct alternative : **7**

1) Compared to a two-point testcross, a three-point testcross
   a) Is more accurate b) Is less accurate
   c) Is equally accurate d) Measures different things

2) A bacterial cell transfers chromosomal genes to F-cells, but it rarely causes them to become F^+. The bacterial cell is
   a) Hfr b) Lysogenic c) Auxotrophic d) Lytic

3) Crossing over in diploid organism is responsible for
   a) Dominance of genes b) Segregation of alleles
   c) Recombination of linked genes d) Linkage between genes

4) Genes which confer antibiotic resistance on bacteria are located on _____
   a) Chromosomal DNA b) Plasmid
   c) RNA d) Polysomes

5) Independent assortment of Mendel was proved by _____
   a) Back cross b) Monohybrid cross
   c) Dihybrid cross d) Incomplete dominance

P.T.O.

6) Back cross to the recessive parents is known as _____
   a) Linkage b) Crossing over
   c) Test cross d) Reversion

7) Coupling and repulsion phenomenon was concerned with
   a) Crossing over b) Mutation
   c) Linkage d) All of these

B) Answer the following terms : **7**

1) Germinal mutations
2) Dominance
3) Penetrance
4) Nullisomy
5) Complete linkage
6) Extra chromosomal inheritance
7) Tetrad.

SECTION – II

Attempt **any four** :

2. What is gene interaction ? Explain with suitable example supplementary and inhibitory gene action. **14**

3. Write an essay on conjugation. **14**

4. Explain in detail structural alterations of chromosomes. **14**

5. Explain with suitable example inheritance of plasmid. **14**

6. Answer **any two** of the following : **14**
   1) Describe sex influenced characters.
   2) What are mutants ? Describe conditional mutant.
   3) Explain with suitable example law of independent assortment.

7. Answer **any two** of the following : **14**
   1) Explain insertional mutagenesis.
   2) Describe in detail tetrad analysis.
   3) Explain with suitable example inheritance of mitochondrial gene.

_____

SLR-VK – 8

Seat No.	

M.Sc. (Part – I) (Semester – I) Examination, 2014
BIOTECHNOLOGY
(New C.G.P.A. Pattern)
Paper – IV : Biostatistics and Bioinformatics

Day and Date : Monday, 28-4-2014 Total Marks : 70

Time : 11.00 a.m. to 2.00 p.m.

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

PART – I

1. A) Rewrite the sentence after choosing the correct answer from the given alternatives. **7**

1) _____ is one of the genome information resource.
a) NCBI b) PIR c) SIB d) RCSB

2) The secondary database of protein is _____
a) Swiss prot b) Trembl c) Blocks d) PDB

3) FASTA was developed by _____
a) Needleman and Wunch b) Smith and Waterman
c) Lipman and Pearson d) None

4) _____ is one of the protein secondary structure.
a) helix b) turn c) sheet d) all

5) A subset of the population selected to help make inferences on a population is called _____
a) population b) inferential statistics
c) census d) sample

P.T.O.

6) Which of the following is not a measure of central tendency ?
   a) mode b) variability c) median d) mean

7) It is necessary to find cumulative frequencies in order to draw _____
   a) histogram b) frequency polygon
   c) ogive curve d) column chart

B) Definitions : **7**

1) Genome
2) Alignment
3) Homology
4) Biostatistics
5) Variable
6) Probability
7) Chi-square test

PART – II

Answer **any four** of the following :

2. Write a note on Genome Information Resources. **14**

3. Add a note on structural databases of proteins. **14**

4. What is coefficient distribution ? Write uses of these distributions in describing biological models. **14**

5. Write a detail account on regression and correlation. **14**

6. Answer **any two :** **14**
   a) Write a note on pairwise sequence alignment.
   b) Add a note on Phylogenetic analysis softwares.
   c) Calculate Quartile deviation from the data 11, 12, 20, 16, 18, 30, 44, 40, 50, 46, 62.

7. Answer **any two :** **14**
   a) What is Protein structure prediction ?
   b) What is coefficient of variance ? Mention its importance.
   c) Graphical representation of data.

SLR-VK – 9

Seat No.	

M.Sc. Biotechnology (Semester – II) Examination, 2014
ENZYMOLOGY (Paper – I) (Old)

Day and Date : Tuesday, 22-4-2014 Max. Marks : 100
Time : 11.00 a.m. to 2.00 p.m.

SECTION – I

1. Rewrite the following sentence by choosing the correct answer : **10**

   1) Biotin is essential for _____

      a) Translation b) Carboxylation
      c) Hydroxylation d) Transamination

   2) The term enzyme was coined by _____

      a) Koshland b) Fisher
      c) Kuhne d) Sumner

   3) In competitive enzyme activity inhibition.

      a) The structure of inhibitor generally resembles that of the substrate
      b) Inhibitor decreases apparent K_m
      c) K_m remains unaffective
      d) Inhibitor decreases V_{max} without affecting K_m

   4) The isoenzymes of LDH

      a) Differ only in a single amino acid
      b) Differ in catalytic activity
      c) Exist in 5 forms depending on M and H monomer contents
      d) Occur as monomers

   5) Ternary complex is not formed in _____

      a) Ordered bi bi reaction b) Random bi bi reaction
      c) Ping pong bi bi reaction d) All of these

6) The subunit composition of lactate dehydrogenase of heart is _____

a) M_4 b) M_2H_2

c) HM_3 d) H_4

7) Which of the following is a proteolytic enzyme ?

a) Pepsin b) Trypsin

c) Chymotrypsin d) All of these

8) From the following myocardial infarction, the earliest serum enzyme to rise is

a) Creatine kinase b) GOT

c) GPT d) LDH

9) Competitive inhibition can be relieved by raising the

a) Enzyme concentration b) Substrate concentration

c) Inhibitor concentration d) None of these

10) Covalent modification of an enzyme usually involves phosphorylation dephosphorylation of residue

a) Serine b) Proline

c) Hydroxylysine d) Hydroxyproline

2. a) Explain in detail the classes of enzyme. **10**

b) What is feedback inhibition ? Explain its types. **10**

OR

Explain in detail structure function relationship of enzyme Na^+K^+ATPas. **20**

3. A) What is the immobilization of enzyme ? Write the methods of immobilization. **10**

B) Write short note on follows **(any two)** : **10**

a) Induced fit hypothesis

b) Steriospecifysity of enzyme

c) End point kinetic assay.

SECTION – II

4. Rewrite the following sentence by choosing the correct answer : **10**

1) In Na^+K^+ATPas catalytic activity and ion binding sites are present in _____ subunit.

a) α b) β

c) Both α and β d) None of these

2) Glutamine synthetase is inhibited by _____ inhibition.

a) Concerted b) Cumulative

c) Sequential d) All of these

3) International unit is _____ μ katal.

a) 6 b) 60

c) 0.6 d) 600

4) Pyruvate is converted into acetyl-CoA by

a) Decarboxylation b) Dehydrogenation

c) Oxidative decarboxylation d) Oxidative deamination

5) _____ is potent activator of phosphofructokinase.

a) Fructose-2, 6-biphosphate b) Lactate

c) Pyruvate d) Citrate

6) _____ is the EC number of alcohol dehydrogenase.

a) 2.1.2.3 b) 1.1.1.1

c) 3.1.1.1 d) 3.2.1.4

7) Ternary complex is not formed in _____

a) Ordered bi bi reaction b) Random bi bi reaction

c) Ping pong bi bi reaction d) All of these

8) Feedback inhibition of enzyme action is affected by

a) Enzyme b) Substrate

c) End products d) None of these

9) In reversible noncompetitive inhibition enzyme activity is _____

a) V_{max} is increased

b) K_m is increased

c) K_m is decreased

d) Concentration of active enzyme is reduced

10) K_m value indicate affinity between _____

a) Enzyme and substrate b) Enzyme and cofactor

c) Enzyme and coenzyme d) Enzyme and coenzyme

5. What are inhibitors ? Explain in detail competitive, uncompetitive, non competitive inhibition with its kinetics. **20**

OR

Explain in detail structure function relationship of enzyme aspartate transcarbomylase. **20**

6. A) Derive Michaelis menten equation. Add a note on turn over number of enzyme. **10**

B) Write short note on follows **(any two)** : **10**

a) Allosteric regulation

b) MWC model

c) Applications of bioreactor.

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