SLR-J – 1

Seat No.	

B.Sc. (Part – I) (Semester – I) (Biotechnology) Examination, 2016
(CBCS Pattern) (New)
ENGLISH (Compulsory)
On Track-English Skills for Success

Time : $2^{1}/_{2}$ Hours Max. Marks : 70

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicate **full** marks.*

1. Rewrite the following sentences by choosing the correct alternative : **14**

1) The poem 'Bangle Sellers' is written by _____

a) Sarojini Naidu b) W. B. Yeats

c) Robert Hayden d) O. Henry

2) Which one of the following is a simile ?

a) Like the flame of her marriage b) Unfair brow

c) Gold-flecked grey d) Rainbow tinted circles of light

3) The Irish airman is fighting in the war because of _____

a) A lonely impulse of delight b) A sense of duty

c) Cheering crowds d) Law

4) _____ began to turn into the main criterion to reckon intelligence in our society.

a) EQ test b) IQ test c) Fitness test d) None of the above

5) The word 'intelligence' is derived from a _____ word.

a) French b) English c) Russian d) Latin

6) Miss Krishna talked endlessly of her _____

a) Sister b) Brother c) Mother d) Father

P.T.O.

7) The writer took _____ from Miss Krishna's trunk with the permission of her sister.
   a) A spoon b) A glass c) Fountain pen d) Little clock

8) Jimmy Wells is a _____
   a) Teacher b) Postman c) Sailor d) Policeman

9) Jimmy and Bob decided that they will meet at Big Joe Brady's restaurant after _____ years.
   a) 30 b) 20 c) 25 d) 35

10) Last week, I met _____ European in Solapur.
   a) a b) an c) the d) zero article

11) Amit is_____ tallest boy in the class.
   a) the b) a c) an d) zero article

12) We will meet _____ Monday.
   a) off b) of c) at d) on

13) Who is your Chemistry teacher ? The underlined noun is a _____ noun.
   a) collective b) proper c) common d) abstract

14) The shop is _____ my flat.
   a) at b) under c) for d) below

2. Answer **any seven** of the following questions : **14**

1) Why did the narrator consider Miss Krishna an annoying guest ?
2) What is found in Miss Krishna's trunk ?
3) Why did Miss Krishna come to stay at narrator's house ?
4) What is the meaning of the term 'artificial intelligence' ?
5) In which areas does computer work faster than human beings ?
6) What are the myths regarding the intelligence of computers ?
7) How does writer describe Bob ?
8) What was the nickname for Bob that the plain-clothes policeman used ? What does it mean ?

3. A) Write short paragraphs on **any two** of the following : **8**

   1) Meaningful education.

   2) The importance of physical exercise

   3) Deforestation.

   B) Answer **any two** of the following questions briefly : **6**

   1) Examine the role of women in the poem 'Bangle Sellers' ?

   2) How does the poet describe the life of middle-aged faithful wife ?

   3) What is the Irish man's attitude towards the war he is fighting in ?

4. Write an essay on **any one** of the following : **14**

   1) Benefits of meditation.

   2) Farmer's suicides : Causes and solutions.

5. Read the following passage and make notes of it. Give an appropriate title for your notes : **14**

   Money has various uses in the modern world : It is a measure of the value of goods and services, a means of exchanging such goods and services and in a way to store up buying power so that one can use it later.

   As a measure of value, it is of the very great use. If I work in the office, how can my employer know what to pay me for my services, if there is no generally recognised measure of value ? He may decide to pay me a certain number of loaves and bread each week. But then, I shall have to exchange some of those loaves for other things I need. Money gives us a very useful means of measuring such relative values. Money is also of great use as a means exchanging goods and services. I can consider it as a means of storing up buying power, and I find it, it has good and bad points. It can more easily be kept a long time than such things as food, which rots or buildings, which slowly fall to pieces or machines which rust. It takes up very little space and if you put it in a bank, it is safe as anything in this world can be.

SLR-J – 2

Seat No.	

B.Sc. I (Biotechnology) (Semester – I) (New CBCS) Examination, 2016
ECOLOGY AND MICROBIOLOGY
Paper – I : Ecology

Time : 2 Hours 30 Minutes | Total Marks : 70

1. Rewrite the sentences using correct alternatives given below. **14**

i) Edaphic factors are included in

a) Abiotic component b) Biotic component

c) Producers d) Consumers

ii) Decomposition of complex compound into simplex form carried by

a) Carnivors b) Herbivors c) Omnivors d) Decomposers

iii) Cloud formation occurs in _____ zone.

a) Troposphere b) Stratosphere c) Mesosphere d) Inospheres

iv) _____ is the general term used for all materials originating from photosynthesis.

a) Biomass b) Energy c) Chlorophyll d) Biogas

v) The soil which is formed by weathering of soil forming rocks is called as _____ soil.

a) Embryonic soil b) Transported soil

c) Secondary soil d) Sedentary soil

vi) _____ Horizon is characterized by major organic components.

a) B Horizon b) A Horizon c) O Horizon d) C Horizon

vii) _____ is defined as capacity to do work.

a) Surface tension b) Porosity c) Viscosity d) Energy

viii) Surface configuration and physical features of an area is called as

a) Geography b) Background c) Topography d) Soil profile

ix) _____ are able to convert light energy in to chemical energy.

a) Birds b) Reptiles c) Animals d) Plants

x) CO_2 content in air is _____ %.

a) 79 b) 12 c) 0.03 d) 0.3

xi) The rate at which energy accumulates in green plant is called as _____ productivity.

a) Net b) Secondary c) Gross primary d) Primary

xii) The annual precipitation (Rainfall) in forest ecosystem ranges between _____ cm.

a) 10 – 15 b) 75 – 150 c) 5 – 10 d) 150 – 200

xiii) An example of lotic water body is

a) Pond b) River c) Lake d) Reserviour

xiv) Zoo falls under the conservation type "_____".

a) *In situ* b) *In vivo* c) *In vitro* d) *Ex situ*

2. Define and explain **any seven** of the given below : **14**

i) Atmosphere.

ii) Productivity.

iii) Climax community.

iv) Sedimentary rocks.

v) Endangered species.

vi) Aquatic Ecosystem.

vii) Heterotropic succession.

viii) Gaseous cycle.

ix) Ammonification.

3. A) Answer **any two** of the given below : **10**

   i) Write a short note on water cycle.

   ii) Explain types of water sources.

   iii) Explain in detail biogeographical classification of India.

   B) Explain in detail nitrogen cycle. **4**

4. Answer **any two** of the given below : **14**

   i) Give a detailed account on soil erosion and its preventive measures.

   ii) Explain in brief hot spots of India.

   iii) Explain structure and composition of atmosphere with labeled diagram.

5. Answer **any two** of the given below : **14**

   i) Explain renewable and non renewable energy sources.

   ii) Write a note on our environment.

   iii) Explain in detail structure of ecosystem.

SLR-J – 3

Seat No.	

B.Sc. I (Semester – I) (Biotechnology) (CBCS) Examination, 2016
Ecology and Microbiology (New)
Paper – II : MICROBIOLOGY

Time : 2 Hours 30 Minutes Max. Marks : 70

N.B. *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to ***right*** *indicate* ***full*** *marks.*

1. Rewrite the sentences by selecting correct answer from the given alternatives. **14**

i) The filterable nature of viruses was first discovered by _____
   a) d. Herelle and Twort b) Stanley
   c) Ivanowsky d) Joseph Lister

ii) Bacillus anthracis is causative agent of anthrax was discovered by _____
   a) Louis Pasteur b) Robert Koch c) Joseph Lister d) Edward Jenner

iii) The type of ribosome present in prokaryotic cell is _____.
   a) 25 S b) 70 S c) 80 S d) 60 S

iv) The major locomotory structure of bacterial cell is _____
   a) Flagella b) Cilia c) Pili d) None of these

v) Teichoic acid is present in the cell wall of _____
   a) Gram negative bacteria b) Gram positive bacteria
   c) Algae d) Protozoa

vi) _____ is the structural component of bacterial cell membrane.
   a) Amino sugar b) N-acetyl glucosamine
   c) Phospholipids d) Polysaccharides

vii) _____ is example of protozoa.
   a) Penicillium b) Bacillus c) Chlorella d) Amoeba

viii) _____ of the following are fungi.
   a) Aspergillus b) Penicillium c) Both of these d) None of these

ix) Aflatoxin is produced by _____

a) Bacteria b) Fungi c) Viruses d) Nematodes

x) _____ organism are called as intermediates between bacteria and viruses.

a) Archae b) Mycoplasma c) Rickettsia d) Actinomycetes

xi) _____ bacteria doesnot possess cell wall.

a) Archae b) E.coli c) Mycoplasma d) Pseudomonas

xii) The protein coat of virus is called as _____

a) Nucleid b) Capsid c) Envelope d) None of these

xiii) _____ are most primitive group of algae.

a) Blue green algae

b) Red algae

c) Brown algae

d) Green algae

xiv) _____ is an indicator organism of faecal pollution.

a) Enterobacter b) Pseudomonas

c) E.coli d) Staphylococcus

2. Answer **any seven** of the following : **14**

i) Koch's postulates.

ii) Define capsule and slime layer.

iii) Give any four characteristics Archaebacteria.

iv) Give function of flagella and pili.

v) Give any four characters of Fungi.

vi) Contributions of Antony Van Leeuwenhoek.

vii) Define virology and give any two examples of viruses.

viii) Give any two examples of Archaebacteria.

ix) Define Geomicrobiology.

3. A) Answer **any two** of the following : **10**

   i) Explain the disproval of theory of 'Spontaneous generation.

   ii) Give contributions of Louis Pasteur and Robert Koch.

   iii) Explain any five branches of applied Microbiology.

   B) Explain in detail structure and function of Gram positive bacterial cell wall. **4**

4. Answer **any two** of the following : **14**

   i) Explain types of microorganisms.

   ii) Give general characteristics of Actinomycetes and Mycoplasma.

   iii) Explain structure and function of endospore.

5. Answer **any two** of the following : **14**

   i) Give difference between eukaryotic and prokaryotic cell.

   ii) Write in detail beneficial and harmful activities of microorganisms.

   iii) Explain structure and function of flagella and its arrangements on it.

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SLR-J – 4

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) (CBCS) Examination, 2016
INTRODUCTION TO BIOSCIENCES (New)
Paper – I : Animal Sciences

Time : 2 ½ Hours Max. Marks : 70

Instructions** : 1) **All** questions are **compulsory.
*2) Draw **neat** and labeled diagrams **wherever** necessary.*
*3) Figures to the **right** indicate **full** marks.*

1. Rewrite the following sentences by using correct alternative : **14**

1) The functional unit of muscle fibre is
   a) Neuron b) Nephron c) Sarcomere d) Actin

2) Mammalian bone is made up of structural and functional units called
   a) Seminiferous tubule b) Uriniferous tubule
   c) Sarcomere d) Haversian system

3) Microvilli in the small intestine is meant for
   a) Secretion b) Absorption
   c) Ultrafiltration d) Protection

4) Endometrium refers to the cellular lining of
   a) Uterus b) Intestine c) Bones d) Blood vessels

5) In honeybee colony, workers are
   a) Fertile male b) Fertile female
   c) Sterile female d) Sterile male

6) Oxyntic cells in the stomach secretes
   a) Trypsinogen b) Pepsinogen c) HCl d) Mucous

7) During nuptial flight queen release _____ to attract males.
   a) Hormones b) Acid c) Pheromones d) Enzyme

8) _____ is causative agent of Malaria.
   a) *Taenia solium* b) *Plasmodium vivax*
   c) *Entamoeba histolytica* d) *Fasciola hepatica*

9) *Taenia solium* is belongs to phylum
   a) Platyhelminthes b) Nemathelminthes
   c) Coelenterata d) Annelida

10) Albendazole and Mebendazole is used to treat
   a) Malaria b) Amoebic dysentery
   c) Schistosomiasis d) Ascariasis

11) *Fasciola hepatica* is belongs to class
   a) Trematoda b) Cestoda
   c) Nematoda d) None of these

12) *Eisenia foetida* is related to
   a) Apiculture b) Vermiculture
   c) Sericulture d) Aquaculture

13) _____ silkworm is commercial variety of silkworm commonly reared in India.
   a) Eri b) Muga c) Mulberry d) Tasar

14) _____ is not a fresh water fish.
   a) Rohu b) Catla c) Mrigal d) Sardine

2. Answer the following **(any 7)** : **14**

i) What is meant by vermiwash ?

ii) Give economic importance of fishes.

iii) Give types of honeybees.

iv) Give parasitic adaptations in Ascaris.

v) Draw a neat labeled diagram of *Fasciola hepatica.*

vi) Write a note on nuptial flight.

vii) Define Camouflage.

viii) Give structure of human tooth.

ix) Give functions of blood.

3. A) Answer on **any two** of the following : **10**

i) Describe structure, location and function of cartilage tissue.

ii) Describe life cycle of *Entamoeba histolytica*.

iii) Explain process of vermicompost formation.

B) Write a note on mimicry with suitable example. **4**

4. Answer on **any two** of the following : **14**

i) Describe histology of ovary and testis with neat labeled diagram.

ii) Describe life cycle of *Plasmodium vivax*.

iii) Describe construction and maintenance of fresh water fish farming.

5. Answer on **any two** the following : **14**

i) Describe life cycle of *Taenia solium*.

ii) Describe types, rearing, life cycle and economic importance of silkworm.

iii) Describe structure, location and function of nervous tissue.

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SLR-J– 5

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) Examination, 2016
(NEW CBCS)
Introduction to Biosciences
Paper – II : PLANT SCIENCES

Time : 2 Hours 30 Minutes Total Marks : 70

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Draw **neat** labeled diagram **wherever** necessary.*
*3) Figures to the **right** indicate **full** marks.*

1. Choose the most correct alternative for the following and rewrite the sentences : **14**

1) Embryo axis is also called as
a) Tegman b) Tiller c) Tigellum d) Scutellum

2) _____ alga used as salad.
a) *Lamnaria* b) *Ulva* c) *Polysiphonia* d) *Fucus*

3) _____ is used as biofungicide.
a) *Trichoderma* b) *Cercospora* c) *Fusarium* d) *Aspergillus*

4) Fungi like _____ provide high protein source.
a) *Agaricus bisporus* b) *Plerotus sajor*
c) *Morchella* d) All of the above

5) _____ is called as wood rot fungi.
a) *Candida* b) *Polyporus* c) *Mucor* d) *Amanita*

6) The main function of sclerenchyma is
a) to storage food b) photosynthesis
c) to give strength d) to float on water

7) In stem anatomy, the outermost layer is
a) Endodermis b) Pericycle c) Xylem d) Epidermis

8) Pollen grain represents
   a) Male gametophyte
   b) Partly developed male gametophyte
   c) Female gametophyte
   d) Female gamete

9) Tunica-Corpus theory based on
   a) plane of cell division
   b) direction of cell division
   c) rate of shot tip growth
   d) number of surface layers

10) Agar-agar is obtained from
   a) *Spirogyra* b) *Sargassum* c) *Gracillaria* d) *Nostoc*

11) Mango is _____ type of fruit.
   a) pepo b) berry c) drupe d) capsule

12) Endosperm is generally
   a) Haploid b) Diploid c) Triploid d) Polyploid

13) Height of plant increased due to the
   a) apical meristem
   b) lateral meristem
   c) intercalary meristem
   d) parenchyma

14) Innermost layer of the cortex is called
   a) hypodermis b) epidermis c) endodermis d) pericycle

2. Attempt **any seven** of the following : **14**

1) Write any four general characters of Fungi.
2) Give functions of parenchyma.
3) Give types of aestivation.
4) Enlist types of ovules.
5) What is Calyx ?
6) Give examples of aggregate fruits.
7) Write any two advantages of pollination.
8) Write the functions of Phloem.
9) Draw neat labeled diagram typical flower.

3. A) Attempt **any two** of the following : **10**

   1) Describe normal secondary growth of dicot stem.

   2) Explain with suitable diagram types of vascular bundle.

   3) Write the general characters of Bryophytes.

   B) Describe structure of seed. **4**

4. Attempt **any two** of the following : **14**

   1) Describe aggregate fruits with suitable example.

   2) Give economic importance of Pteridophytes.

   3) What is pollination ? Describe its types with suitable example.

5. Attempt **any two** of the following : **14**

   1) Give an account on origin of staple food.

   2) Describe development of female gametophyte of angiosperm.

   3) Give an account on annual ring and periderm formation.

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SLR-J – 6

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) Examination, 2016
(New-CBCS Pattern)
FUNDAMENTALS OF CHEMISTRY AND BIOPHYSICS
Chemical Sciences (Paper – I)

Time : $2^{1}/_{2}$ Hours Max. Marks : 70

N.B. : *1)* ***All*** *questions are* ***compulsory****.*
2) Figures to ***right*** *indicate* ***full*** *marks.*
3) Use of log tables/calculators is ***allowed****.*

1. Select the most correct alternative from those given below and complete the sentence : **14**

1) The average carbon-carbon bond length in compounds with sp^2 hybridized carbon is _____ A°.
   a) 1.54 b) 1.33
   c) 1.44 d) 2.25

2) Ethene molecule has _____ geometry.
   a) Tetrahedral b) Liner
   c) Triangular d) Octahedral

3) _____ is an extensive property.
   a) Molarity b) Density
   c) Normality d) Molality

4) _____ molecule is formed by covalent bond.
   a) KCl b) Methane
   c) $Cu[NH_3]_4$ d) NaCl

5) When weight of compound equal to its equivalent weight is dissolved in one liter of solvent the solution will be one _____ solution.
   a) Molar b) Percent
   c) Molal d) Normal

P.T.O.

6) _____ is an example of non-polar solvent.
   a) Water b) Methyl alcohol
   c) Benzene d) Ethyl alcohol

7) According to VBT ammonia molecule has _____ shape.
   a) Pyramidal b) T
   c) V d) L

8) The unit for first order reaction rate constant is _____
   a) mol dm^{-3} $time^{-1}$ b) mol^{-1} dm^{-3} $time^{-1}$
   c) $time^{-1}$ d) mol dm^{3} $time^{-1}$

9) pH value of basic buffer has _____ range of pH.
   a) 2-6 b) 4-7
   c) 1-3 d) 8-14

10) _____ is used as an indicator for strong acid and weak base titration.
   a) Phenolphthalein b) Methyl orange
   c) Eriochrome Black-T d) EDTA

11) H-C-H bond angle in ethene is _____
   a) $109° 28'$ b) 120°
   c) 180° d) 107°

12) $CH_4(g) + Cl_2(g) \rightarrow CH_3Cl(g) + HCl(g)$ is an example of _____ catalysis.
   a) Homogeneous b) Heterogeneous
   c) Auto d) Enzyme

13) Enzyme catalyzed reactions are carried out at _____
   a) Room temperature b) Very high
   c) Very low d) Very high pH

14) _____ is an example of colligative property.
   a) Osmotic pressure b) Volume
   c) Mass d) Weight

2. Attempt **any seven** of the following : **14**

   1) Write integrated rate expression for zero and first order reactions.

   2) Give one example of ionic and covalent compounds.

   3) Give any two general characteristics of ionic solids.

   4) Mention different types of bonds present in bio-molecules.

   5) Define dipole moment.

   6) Define hybridization, mention its types.

   7) Define bond angle and bond length.

   8) What is common ion effect ?

   9) What is one molar solution ?

3. A) Attempt **any two** of the following : **10**

      1) Discuss classification of solvent on the basis of polarity with examples.

      2) Define solvation energy, explain various factors affecting solubility.

      3) Derive integrated rate expression for first order reaction.

   B) For a first order reaction rate constant is 6.4×10^{-4} and initial concentration is 0.04 M, how long it will take to react 50% of the reactant ? **4**

4. Attempt **any two** of the following : **14**

   1) What are enzymes catalyzed reactions ? Give different characteristics of enzyme catalyzed reactions.

   2) Derive an integrated rate expression for second order reaction with equal concentration.

   3) Explain concept of sp^2 hybridization with respect to C_2H_4 molecule.

5. Attempt **any two** of the following : **14**

   1) Derive Henderson equation for basic buffers.

   2) Explain the terms rate constant, order and molecularity of reaction.

   3) What is pH and pOH ? Explain buffer capacity.

SLR-J – 7

Seat No.	

B.Sc. – I (Semester – I) (Biotechnology) (New-CBCS Pattern)
Examination, 2016
FUNDAMENTALS OF CHEMISTRY AND BIOPHYSICS
Biophysics (Paper – II)

Time : 2½ Hours Max. Marks : 70

Instructions *: i)* ***All*** *questions are* ***compulsory****.*
ii) Figures to the ***right*** *indicate* ***full*** *marks.*
iii) ***Neat*** *diagrams should be drawn* ***wherever*** *necessary.*

1. Select the correct alternative from the following : **14**

i) Tensile stress is related to changes in _____ of a body.
a) Volume b) Length c) Shape d) Mass

ii) cgs unit of coefficient of viscosity is
a) Poise b) erg c) Newton d) Hertz

iii) In Helium-Neon Laser, type of pumping is
a) Optical b) Electrical c) Chemical d) Thermal

iv) The angle of contact is _____ for the liquid which does not wet the solid.
a) Zero b) Acute c) Right angle d) Obtuse

v) If the frequency of wave is above _____ then the wave is called ultrasonic wave.
a) 20 Hz b) 1 KHz c) 2 KHz d) 20 KHz

vi) Liquid surface has a tendency to
a) Expand b) Contract c) Rise d) Spread

vii) Bulk modulus is the property of
a) Only solids b) Only liquids
c) Solids, liquids and gases d) Liquids and gases

viii) If V is the velocity of a fluid flow through a pipe of cross sectional area A then the relation between them is

a) $V \propto A$ b) $V \propto A^2$ c) $V \propto \frac{1}{A}$ d) $V \propto \frac{1}{A^2}$

ix) By Brewster's law, polarising angle (i_p) and refractive index (μ) are related as

a) $\mu = \sin(i_p)$ b) $\mu = \cos(i_p)$ c) $\mu = z(i_p)$ d) $\mu = \tan(i_p)$

x) In general viscosity of liquid _____ with increase in temperature.

a) Increases b) Remains same
c) Decreases d) Either increase or decrease

xi) For propagation of _____ material medium is required.

a) X-rays b) Mechanical waves
c) Electromagnetic waves d) Light waves

xii) Surface tension of liquids _____ with rise in temperature.

a) Decreases b) Increases
c) Does not change d) Either increase or decrease

xiii) Dimensions of stress are

a) $[M^1L^{-1}T^{-2}]$ b) $[M^2L^{-1}T^{-2}]$ c) $[M^0L^{-1}T^{-1}]$ d) $[M^1L^1T^{-2}]$

xiv) When an angle of incidence (i) is equal to 35°, by the law of reflection the angle of reflection is equal to

a) 55° b) 155° c) 35° d) 70°

2. Answer **any seven** of the following : **14**

1) Define :
   a) Range of molecular attraction
   b) Sphere of influence.
2) What do you mean by population inversion ?
3) State the principle of superposition of waves.
4) Define coefficient of viscosity.
5) State the Snell's law of refraction.
6) How beats are formed ?
7) State Hooke's law.
8) State Bernoulli's theorem.
9) State the relation between Young's modulus, bulk modulus and modulus of rigidity.

3. A) Answer **any two** of the following : **10**
   1) What are transverse and longitudinal waves ? State any three characteristics of each.
   2) What is elasticity ? Explain the importance of elasticity.
   3) Write a note on 'Nicol Prism'.

   B) Explain the terms :
   a) Streamline flow
   b) Turbulent flow. **4**

4. Answer **any two** of the following : **14**
   1) Describe Jaeger's method for measurement of surface tension.
   2) Describe construction and working of Helium-Neon Laser.
   3) Describe the construction and working of venturimeter.

5. Answer **any two** of the following : **14**
   1) Define angle of contact and discuss the term wettability.
   2) What is Doppler effect ? Explain any three applications of Doppler effect.
   3) Explain the stress-strain curve within and beyond elastic limit.

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SLR-J – 8

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) (CBCS) Examination, 2016
CELL BIOLOGY AND BIOSTATISTICS (New)
Paper – I : Cell Biology

Time : 2½ Hours Max. Marks : 70

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Draw ***neat*** *and labelled diagrams* ***wherever*** *necessary.*
3) Figures to ***right*** *indicates* ***full*** *marks.*

1. Rewrite the following sentences by using correct alternative : **14**

1) PPLOs means
   a) Poly-Pneumonia Level Organisms
   b) Poly-Pneumonia Like Organisms
   c) Pleuro-Pneumonia Like Organisms
   d) Pleuro-Pneumonia Level Organisms

2) Plant cell wall consists of
   a) Cellulose b) Hemicellulose c) Lignin d) All of these

3) _____ discovered mitochondria from muscle cells.
   a) A. Kolliker b) Schleicher
   c) W. Flemming d) Schimper

4) _____ introduced the term chromosome.
   a) T. Boveri b) W. Waldeyer c) C. Benda d) Camillo Golgi

5) _____ is known as equational cell division.
   a) Amitosis b) Fission c) Meiosis d) Mitosis

6) Programmed cell death is called
   a) Necrosis b) Apoptosis c) Cell suicide d) Cell quit

7) _____ is called cytoskeletal proteins.
   a) Microtubules b) Intermediate filaments
   c) Actin filaments d) All of these

8) _____ is not a property of genetic code.
   a) Triplet b) Ambiguous c) Degeneracy d) Commaless

9) "Fluid mosaic model" of plasma membrane was proposed by
   a) Robertson b) Singer and Nicolson
   c) Danielli and Davson d) Gorter and Grendel

10) _____ junctions is an example of communication junctions.
   a) Gap b) Tight
   c) Desmosomes d) Hemi-desmosomes

11) _____ is not a property of cancer cell.
   a) Contact inhibition b) Uncontrolled cell division
   c) Autocrine signaling d) Self supplement of growth factors

12) _____ is an example of active transport.
   a) Osmosis b) Simple diffusion
   c) Facilitated diffusion d) Na-K ATPase

13) In paracrine signaling, _____ is act as signaling molecule.
   a) Neurotransmitter b) Hormone
   c) Pheromone d) Enzyme

14) _____ sequence is required for protein transport into the nucleus.
   a) Nuclear Localization Signal (NLS)
   b) Nucleolus Localization Signal (NLS)
   c) Nuclear Loading Signal (NLS)
   d) Nuclear Loading Sequences (NLS)

2. Answer the following (**any 7**) : **14**

i) What are plastids ?
ii) What are intermediate filaments ?
iii) Give functions of ER.
iv) Write a note on cell synchrony.
v) Draw a neat labelled diagram of desmosomes.
vi) Write a note on Wobble hypothesis.
vii) What is simple diffusion ?
viii) What is sorting signal ?
ix) Give properties of cancer cells.

3. A) Answer on **any two** of the following : **10**
   i) Describe structure, assembly and functions of microtubules.
   ii) Explain fluid mosaic and unit membrane model of plasma membrane.
   iii) Explain the properties of genetic code with suitable examples.

   B) Describe synaptic and paracrine signaling with neat labelled diagram. **4**

4. Answer on **any two** of the following : **14**
   i) Describe ultrastructure of nucleus with its functions.
   ii) Describe process of meiosis with its significance.
   iii) Describe types of passive transport with suitable examples.

5. Answer on **any two** of the following : **14**
   i) Describe protein trafficking in nucleus and mitochondria.
   ii) Describe structure, types and function of typical eukaryotic chromosome.
   iii) Describe ultrastructure and function of mitochondria and ribosomes.

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SLR-J – 9

Seat No.	

B.Sc. – I (Biotechnology) (Sem. – I) (New CBCS) Examination, 2016
CELL BIOLOGY AND BIOSTATISTICS
Paper – II : Biostatistics

Time : $2^{1}/_{2}$ Hours Max. Marks : 70

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Figures to **right** indicates **full** marks.*
*3) **Use** of basic calculator is **allowed**.*
*4) **Use** graph paper **wherever** necessary.*

1. Rewrite the following sentences by using correct alternative. **14**

1) In a table the headings of the columns are called
   a) Stubs b) Captions c) Titles d) Source Note

2) Histogram can be used only when
   a) class intervals are equal or unequal
   b) class intervals are all equal
   c) class intervals are unequal
   d) frequencies in class interval are equal

3) The data given as 5, 7, 12, 17, 79, 84, 91 will be called as
   a) A continuous series b) A discrete series
   c) An individual series d) Time series

4) Extreme value have no effect on
   a) Average b) Median
   c) Standard deviation d) Geometric mean

5) If a constant value 50 is subtracted from each observation of a set, the mean of the set is
   a) increased by 50 b) decreased by 50
   c) is not affected d) zero

6) Mode is

a) Middle most value b) The minimum value

c) Most frequent value d) The maximum value

7) The standard deviation is the

a) Square of the variance b) Square root of variance

c) Sum of variance d) Sum of all deviations

8) When there is not a significant relationship between the dependent variable y and the independent variable x, the value of the correlation coefficient will be approximately

a) – 2 b) – 1 c) 1 d) 0

9) If X and Y are two variates, there can be at most

a) One regression line b) Two regression lines

c) Three regression lines d) Infinitely many lines

10) Probability can take values from

a) $-\infty$ to ∞ b) – 1 to 1 c) 0 to 1 d) 1 to ∞

11) If A and B are two events, the probability of occurrence of A and B simultaneously is given as

a) P(A) + P(B) b) $P(A \cup B)$

c) $P(A \cap B)$ d) $P(A) \cdot P(B)$

12) If the probability of occurring of an event is 1, then the event is called

a) Impossible event b) Special event

c) Sure event d) Independent event

13) If P(A) = 0.5, P(B) = 0.6 and $P(A \cap B) = 0.3$, then $P(A \cup B)$ is

a) 0.8 b) 0.5 c) 0.6 d) 0.0

14) In hypothesis testing, the cut off values which define the rejection region are known as

a) P-values b) Critical values

c) α values d) χ values

2. Attempt **any seven** of the following : **14**

1) Define 'Continuous Variable' and give an example.

2) State demerits of 'Mean deviation'.

3) The mean age of 30 students is 15 years, and the mean age of 70 students is 20 years. Find out the mean age of all 100 students combined together.

4) Compute the coefficient of range for data 33, 16, 77, 64, 79, 39, 21, 6, 52.

5) Find the correlation coefficient (r), if $b_{yx} = 0.8$, $b_{xy} = 0.8$.

6) What is the probability of getting an odd number in single throw with die ?

7) If P(A) = 0.5, P(B) = 0.4 and $P(A \cap B) = 0.1$, Find $P\left(\frac{A}{B}\right)$.

8) If standard deviation $\sigma = 0.35$ and N = 10 then find standard error.

9) If standard deviation $\sigma = 1.32$ and mean $\bar{x} = 12.5$ find the coefficient of variation.

3. A) Attempt **any two** of the following : **10**

1) Write various properties of normal distribution in detail.

2) The income of 70 persons is distributed as follows.

Income (In thousands)	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
No. of persons	10	15	25	12	8

Find the median.

3) A single card is drawn from a deck. Find the probability that it is a queen or a spade.

B) Solve the following : **4**

Blood group 50 students is given below :

Blood Group	A	B	AB	O
No. of students	5	20	10	15

Draw a Pie-Chart.

4. Attempt **any two** of the following : **14**

1) Draw less than and more than Ogive for the following data.

Cost of production	4 – 6	6 – 8	8 – 10	10 – 12	12 – 14	14 – 16
No. of farms	13	111	182	105	19	7

2) Find the coefficient of correlation between X and Y for the following data.

X	43	54	59	68	76
Y	105	98	84	63	50

3) Daily high blood pressure of a patient on 100 days are given below.

B. P. (mmHg)	102	106	110	114	118	122	126
No. of days	3	9	25	35	17	10	1

Find the standard deviation.

5. Attempt **any two** of the following : **14**

1) Find the regression equation X on Y from the following data.

X	3	5	6	6	9
Y	2	3	4	6	5

2) A coin is tossed 200 times of which head comes 120 times and tail 80 times. Use Chi-square test to test the hypothesis that the coin is normal having no bias for either head or tail. (Table value : 3.84)

3) Find the mean deviation from the mean for the following data.

Marks	20	18	16	14	12	10	8	6
Frequency	2	4	9	18	27	25	14	1

SLR-J – 11

Seat No.	

B.Sc. – I (Semester – I) (CGPA) Examination, 2016
BIOTECHNOLOGY (Old)
Ecology and Microbiology

Time : 2.00 Hours 30 Minutes Max. Marks : 70

N.B. *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*
3) Draw ***neat*** *labelled diagrams* ***whenever*** *necessary.*

Paper – I

(**Ecology**)

1. Rewrite the following sentence by choosing correct alternatives given below : **5**

   1) The interlocking pattern between various communities in biosphere is known as
      a) Food chain b) Food web
      c) Energy balance d) All the above

   2) Invasion is the successful establishment of a species in a barren area, it involves
      a) Migration b) Aggregation
      c) Ecesis d) All the above

   3) With an increase in altitude, the temperature is generally
      a) Increases b) Decreases
      c) Remains constant d) Variable

   4) Ecosystem has two components
      a) Plants and animals b) Weeds and trees
      c) Biotic and abiotic factor d) Microorganism only

   5) _____ is sedimentary cycle.
      a) Oxygen cycle b) Sulphur cycle
      c) Water cycle d) Carbon cycle

2. Answer **any five** of the following. **10**
   1) Explain food web with example.
   2) Explain project tiger.
   3) What is secondary succession ?
   4) Explain troposphere.
   5) Explain IUCN.
   6) What is Jhum cultivation ?
   7) Explain chipko andolan.

3. A) Write short notes on **any two** of the following : **10**
      1) Explain causes of deforestation.
      2) Explain insitu conservation of wildlife.
      3) Write down importance of biodiversity.

   B) Answer **any one** of the following. **10**
      1) Enumerate different types of terrestrial ecosystem and explain forest ecosystem in details.
      2) What is natural resource ? Explain soil is an important natural resource.

Paper – II

(**Microbiology**)

1. Rewrite the following sentences by choosing correct alternative given below : **5**
   1) The filterable nature of viruses was first discovered by
      a) D. Herelle and Twort b) Ivanowsky
      c) Hashimoto d) Louis Pasteur
   2) Viruses are _____ in nature.
      a) Prokaryotic
      b) Eukaryotic
      c) Neither prokaryotic nor Eukaryotic
      d) Archaebacteria
   3) Intermediate characters of bacteria as well as viruses are observed in
      a) Mycoplasma b) Rickettsias c) Actinomycetes d) Archaebacteria

4) For the transfer of genetic material from one bacteria to another, cells are using conjugation bridge which is a

a) Pili b) Flagella c) Capsule d) Slime layer

5) Branch of microbiology which deals with recovery of minerals from low grade ores is known as

a) Soil Microbiology b) Air Microbiology

c) Petroleum Microbiology d) Geo-Microbiology

2. Answer **any five** of the following : **10**

1) Define and explain Air Microbiology.

2) Give any four useful activities of microbes.

3) Enlist any four names of reserve food materials in bacteria.

4) Give any four characters of algae.

5) Give any four characters of mycoplasma.

6) Give function of bacterial cell membrane.

7) Give different flagellar arrangements in bacteria.

3. A) Write short notes on **any two** of the following : **10**

1) Structure and function of spores in bacteria.

2) Size and arrangement of bacteria.

3) Give Louis Pasteur's contribution.

B) Answer **any one** of the following : **10**

1) Write an account on difference between Prokaryotic and Eukaryotic cell.

2) Explain General characteristics, classification and cultivation of Fungi.

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SLR-J – 12

Seat No.	

B.Sc. I (Semester – I) (C.G.P.A.) Examination, 2016
BIOTECHNOLOGY
Introduction to Biosciences (Old)

Time : 2½ Hours | Total Marks : 70

Instructions : *1) **All** questions are **compulsory**.*
*2) Answer to the **both** Sections are to be written in **separate** answer books.*
*3) Draw **neat** labelled diagrams **wherever** necessary.*
*4) Figures to the **right** indicate **full** marks.*

PAPER – I
Plant Sciences

1. Rewrite the sentences choosing correct answer from given alternatives. **5**

1) Agar (Agar-Agara) is obtained from marine alga
   a) Sargassum b) Ulva c) Gracillaria d) Padiana

2) The flowers pollinated by wind are called as
   a) Anemophelous b) Ornithophelous
   c) Entamophelous d) Malacophelous

3) _____ is used as biofungicide.
   a) Trichoderma b) Cerospora
   c) Fusarium d) Aspergillus

4) Fungia like _____ provide high protein source.
   a) Agaricus bisporus b) Plerotus sajor
   c) Morchella d) All of the above

5) _____ is called as wood rot fungi.
   a) Candida b) Polyporus
   c) Mucor d) Amanita

P.T.O.

2. Answer **any five** of the following : **10**

   i) Write any five general characters of Fungi.

   ii) Write principles of ICBN.

   iii) Explain types of aestivation.

   iv) Describe types of ovules.

   v) Explain modifications of Calyx.

   vi) Describe the types of aggregate fruits.

   vii) Describe phases of growth.

3. Write short notes on **any two** of the following : **10**

   i) Give an account on merits and demerits of Bentham and Hooker system of Classification.

   ii) Write general characters of Gymnosperm.

   iii) Write an account on Periderm formation.

4. Answer **any one** of the following : **10**

   i) Give an account on Photoperiodism with suitable example.

   ii) Describe development of male gametophyte with suitable diagram.

PAPER – II
Animal Sciences

1. Rewrite the sentences choosing correct answer from given alternatives. **5**

   1) Starfish is an example of phylum

      a) Mollusca b) Echinoderms

      c) Annelida d) Arthropoda

   2) In phylum protozoa locomotion occurs with the help of

      a) Pseudopodium b) Whip like flagella

      c) Small hair like flagella d) All of these

3) _____ is a parasite found to dwell in the liver and bile duct of cattle, sheep, goats and wild ruminants.
   a) *Plasmodium vivax* b) *Fasciola heptica*
   c) *Schistosoma mansoni* d) All of these

4) _____ is the most advanced group of animals.
   a) class Aves b) class Mammalia
   c) class Reptilia d) class Amphibia

5) Which of the following is the species of Honey bees ?
   a) *Eudrilus eugeniae* b) *Caroassius auratus*
   c) *Antheraea mylitta* d) *Apis mellifera*

2. Answer **any five** of the following : **10**
   1) What is the composition and uses of silk ?
   2) What are the effects of parasite plasmodium on the hosts ?
   3) Write down the characteristic of Mammalia.
   4) What are the salient features of Annelida ?
   5) Give the classification of protozoa with example.
   6) Define vermiculture and give its importance.
   7) Give the difference between chordate and Non chordate.

3. Write short notes on **any two** of the following : **10**
   1) Give detail account on Apiculture.
   2) Write the general characters of Phylum Mollusca and mention their classes with one example.
   3) Explain the life cycle of *plasmodium vivax*.

4. Answer **any one** of the following : **10**
   1) Write the general characters of Phylum Chordata and explain any two class of it.
   2) Describe the classification of Non Chordata with example in brief.

_____

SLR-J – 13

Seat No.	

B.Sc. – I (Semester – I) (CGPA Pattern) Examination, 2016
BIOTECHNOLOGY (Old)
Fundamentals of Chemistry and Biophysics

Time : 2½ Hours | Max. Marks : 70

N.B. : *1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*
3) ***Use*** *of log tables/calculator is* ***allowed****.*

PAPER – I

(Chemical Sciences) **35**

1. Select the most correct alternative from those given below and rewrite the complete sentence. **5**

1) _____ is not an extensive property.
   a) Molarity b) Density
   c) Mass d) Volume

2) The unit of first order rate constant is
   a) mol $dm^{-3}time^{-1}$ b) mol^{-1} $dm^{-3}time^{-1}$
   c) $time^{-1}$ d) mol $dm^{3}time^{-1}$

3) Ethene molecule has _____ shape.
   a) Linear b) Triangular
   c) Tetrahedral d) Angular

4) A catalyst increases the rate of the reaction by
   a) Increasing Ea b) Increasing T
   c) Decreasing Ea d) Decreasing T

5) Glass electrode is an example of _____ electrode.
   a) Metal-metal ion b) Ion selective
   c) Gas d) Amalgam

2. Attempt **any five** of the following : **10**
   1) What is salt bridge ?
   2) What are buffers ? Mention types of buffers.
   3) Explain dipolemoment with one example.
   4) Give any four characteristic of catalyst.
   5) Define bond angle and bond length.
   6) What are ionic compounds ? Give two examples.

3. A) Attempt **any two** of the following : **10**
   1) Explain common ion effect with example.
   2) Derive relation between Δ H and Δ G, give examples of spontaneous reactions.
   3) Explain intramolecular and intermolecular hydrogen bonding with example.

   B) Attempt **any one** of the following : **10**
   1) What are different types of electrodes ? Explain construction and working of Saturated Hydrogen Electrode (SHE).
   2) Derive the expression for first order rate constant. For a first order reaction rate constant is 6.8×10^{-4} and initial concentration is 0.04 M how long it will take to for 25% reactant to react.

PAPER – II

(Biophysics) 35

4. Select correct alternative from the following : **5**

   i) Viscosity of water _____ with increase in pressure.
   a) Decreases b) Increases
   c) Remains constant d) May increase or decrease

   ii) Young's modulus is the property of
   a) Only liquids b) Only solids
   c) Solids, liquids and gases d) Liquids and gases

   iii) If the frequency of sound ware is less than 20 Hz then the wave is
   a) Audible b) Ultrasonic c) Infrasonic d) None of these

   iv) Angle of contact between pure water and clean glass is
   a) 90° b) 0° c) 120° d) 50°

   v) _____ indicates the resistance offered by the material when an attempt is made to change its shape.
   a) Modulus of rigidity b) Bulk modulus
   c) Young's modulus d) None of these

5. Answer **any five** of the following : **10**
   1) State any two laws of reflection of light.
   2) Define stress and strain.
   3) State Bernoulli's theorem.
   4) What do you mean by (a) Mechanical waves (b) Electromagnetic waves ?
   5) State Hooke's law.
   6) Define coefficient of viscosity.
   7) State the principle of superposition of waves.

6. A) Attempt **any two** of the following : **10**
      1) Explain the working of Pitot tube.
      2) Explain the stress strain curve within and beyond the elastic limit.
      3) What is doppler effect ? Explain any two applications of doppler effect.

   B) Attempt **any one** of the following : **10**
      1) Describe Jaeger's method for the measurement of surface tension.
      2) What is LASER ? Describe construction and working of Helium-Neon Laser. State any two applications of laser.

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SLR-J – 14

Seat No.	

B.Sc. I (Semester – I) (CGPA) Examination, 2016
BIOTECHNOLOGY
Cell Biology and Biostatistics (Old)

Time : 2 Hours 30 Minutes | Max. Marks : 70

Instructions : *1)* ***All*** *questions are* ***compulsory****.*
2) Draw ***neat*** *and labeled diagrams* ***wherever*** *necessary.*
3) Figures to ***right*** *indicates* ***full*** *marks.*
4) ***Use*** *of basic calculator is* ***allowed****.*
5) ***Use*** *graph paper* ***wherever*** *necessary.*

PAPER – I

(Cell Biology)

1. Rewrite the following sentences by using correct alternative : **5**

1) Primary lysosomes are derived from _____ cell organelle.
   a) RER b) Golgi apparatus
   c) SER d) Ribosomes

2) Crossing over occur in _____ phase of prophase I of meiosis.
   a) Zygotene b) Pachytene
   c) Diplotene d) Leptotene

3) Skin cancer is derived from _____ cells.
   a) Muscle b) Bone c) Epithelial d) Nerve

4) Codons GGA, GGU, GGC and GGG specify same amino acid, this is _____ of genetic code.
   a) Universality b) Degeneracy
   c) Non-ambiguity d) Ambiguity

5) _____ are the type of intermediate filaments.

a) Vimentin b) Lamin

c) Keratin d) All of these

2. Answer the following (**any 5**) : **10**

i) Enlist functions of ER.

ii) Give applications of cell synchrony.

iii) What are plastids ?

iv) What is paracrine signaling ?

v) What are intermediate filaments ?

vi) What are ribosomes ?

3. A) Write short notes on **any two** of the following : **10**

i) Describe the structure of fluid mosaic model of plasma membrane.

ii) Describe ultra structure of typical plant cell.

iii) Explain structure, assembly and functions of microfilaments.

B) Answer **any one** of the following : **10**

i) Describe the components and process of translation in prokaryotes.

ii) Define membrane transport and explain its types with suitable examples.

PAPER – II

(Biostatistics)

1. Rewrite the following sentences by using correct alternative. **5**

1) In a table the headings of the columns are called

a) Stubs b) Captions

c) Titles d) Source Note

2) Mode is

a) Middle most value b) The minimum value

c) Most frequent value d) The maximum value

3) Which of the following measures of dispersion can take non-negative value ?
   a) Range
   b) Standard deviation
   c) Mean deviation
   d) All the above

4) Two events are said to be independent if
   a) Each outcome has equal chance of occurrence
   b) There is no common point in between them
   c) One does not affect the occurrence of the other
   d) Both the events have only one point

5) The probability of all possible outcomes of a random experiment is always equal to
   a) ∞ b) 0 c) 1 d) –1

2. Attempt **any five** of the following : **10**

1) Define 'Primary Data' and give an example.

2) State merits of 'Mode'.

3) Find the median of the 88, 72, 33, 29, 70, 86, 54, 91, 61, 57.

4) Compute the coefficient of range for data 34, 6, 72, 14, 71, 32, 11, 16, 55.

5) Find the correlation coefficient (r), if $b_{yx} = 0.3$, $b_{xy} = 1.2$.

6) What is the probability of getting a prime number in single throw with die ?

7) If $P(A) = 0.25$, $P(B) = 0.6$ and $P(A \cap B) = 0.2$. Are A and B independent events.

3. A) Attempt **any two** of the following : **10**

1) Draw Cumulative frequency curve or Ogive for the following data. Also find Median.

Class Interval	50 – 60	60 – 70	70 – 80	80 – 90	90 – 100	100 – 110	110 – 120
Frequency	8	10	16	14	10	5	2

2) Find the mode from the following data :

Marks	1 – 5	6 – 10	11 – 15	16 – 20	21 – 25
No. of Students	7	10	16	32	24

3) Write a note on 'Scatter Diagram' with illustrations.

B) Attempt **any one** of the following : **10**

1) Find the coefficient of correlation from the following data :

X	1	2	3	4	5	6	7	8	9
Y	10	11	12	14	13	15	16	17	18

2) Find the regression equation Y on X from the following data :

X	7	6	10	14	13
Y	22	18	20	26	24

SLR-J – 15

Seat No.	

B.Sc. – I (Semester – II) (Biotechnology) (CGPA Pattern) Examination, 2016
ENGLISH (Compulsory)
On Track : English Skills for Success

Time : 2½ Hours Total Marks : 70

N. B. : *1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*

1. Rewrite the following sentences by choosing correct alternative given below **each** : **14**

1) Wernher von Braun advised Dr. Kalam to make rocketry his mission and _____

a) profession b) glory c) religion d) division

2) The full form of SLV is _____

a) Satellite Loaded Vehicle b) Satellite Launching Vehicle
c) Satellite Leaving Vehicle d) Satellite Leading Vehicle

3) When did Vivekananda leave Bombay _____

a) On September 11, 1893 b) On May 15, 1893
c) On May 31, 1893 d) On June 5, 1893

4) Who represented the Jains at the Parliament of Religions ?

a) Vivekananda b) Gandhi
c) Pratap Chander Mozoomdar d) Annie Besant

5) The Human Rights Movement began in 1961 with the launching of _____

a) the UNO b) the Anti-Slavery Society
c) the Amnesty International d) the NATO

6) The primary idea of human rights involves _____

a) rights of the government
b) rights for the government
c) right formulated by the government
d) rights to operate against the government

P.T.O.

7) The poem "Brahma" displays the influence of _____ on Emerson.
   a) the Vedas b) the Upanishads
   c) the Geeta d) the Puranas

8) The poem 'Full Moon' is written by _____
   a) Robert Hayden b) Sarojini Naidu
   c) W. B. Yeats d) R. W. Emerson

9) Today the moon is merely an attraction for _____
   a) the children b) the poets c) the lovers d) the scientists

10) One message of the poem "Brahma" is that _____
   a) lovers of good deeds are dear to the god
   b) lovers with sincere love are dear to the god
   c) selfless devotees of the good are dear to the god
   d) non-devotees of the evil are dear to the god

11) The woman wouldn't drink _____ tea without your company.
   a) my b) her c) our d) his

12) Peacock is one of the _____ birds found in India.
   a) more wonderful b) wonderful most
   c) most wonderful d) only wonderful

13) He went to the tailor to _____ his trousers which was a bit too long.
   a) altar b) alter c) alert d) allot

14) Write correct antonyms of 'extempore'.
   a) well-prepared b) careful
   c) extraordinary d) none of these

2. Answer **any seven** of the following questions in **two** or **three** sentences : **14**

1) What does Dr. Kalam say about working for mission ?
2) What does Wernher von Braun think of the American ?
3) Where did Swami Vivekananda leave for and why ?

4) What did Swami Vivekananda speak about at the parliament of Religion ?

5) Human rights are against the government. How ?

6) What is the Amnesty International ?

7) Who wrote the poem 'Brahma' ?

8) How did different people approach the moon in the past ?

3. A) Write short answers on **any two** of the following : **8**

1) What pitcher of Dr. Kalam emerges from the essay 'Work Brings Solace' ?

2) How did Swami Vivekananda manage to reach Chicago ?

3) Why is it difficult to defend human rights ?

B) Answer **any two** of the following briefly : **6**

1) What is notice ?

2) What are the aspects of good C.V. ?

3) What is an e-mail ?

4. Write a suitable C.V. for the post of lecture in physics. **14**

OR

Write a notice, agenda and minutes for college gathering meeting.

5. Write a three paragraph e-mail letter accepting the offer of appointment letter. **14**

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SLR-J – 17

Seat No.	

B.Sc. – I (Biotechnology) (Semester – II) (CGPA) Examination, 2016
BIOCHEMISTRY AND CELL PHYSIOLOGY

Time : 2½ Hours Total Marks : 70

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Draw **neat** and labeled diagrams **wherever** necessary.*
*3) Figures to **right** indicates **full** marks.*
*4) **Use** of calculator is **allowed**.*

PAPER – I
(Biochemistry)

1. Rewrite the following sentence by choosing the correct answer : **5**

1) _____ is an example of saturated fatty acid.

a) Arachidonic acid b) Linoleic acid
c) Oleic acid d) Palmitic acid

2) A purine molecule is _____

a) AMP b) UMP
c) CMP d) TMP

3) An amino acid that does not form α -helix is _____

a) Valine b) Proline
c) Tyrosine d) Tryptophan

4) _____ coenzyme is involved in oxidative decarboxylation.

a) Thiamine pyrophosphate b) Biotin
c) Pyrodoxal phosphate d) NAD^+

5) _____ is an monosaccharide.

a) Sucrose b) Maltose
c) Lactose d) Galactose

2. Answer **any five** of the following : **10**

i) Give different classes of lipids.

ii) Write a note on prostaglandins.

iii) Write any two basic amino acids with its structure.

iv) State the Chargaff's rule of nucleic acids.

v) Write a note on deficiency disorders of Vitamin K.

vi) Draw a structure of starch.

vii) Write the physical properties of carbohydrates.

3. A) Write short note on **any two** of the following : **10**

i) Explain the clover leaf structure of t-RNA.

ii) Write a note on deficiency disorders of Vitamin B_{12}.

iii) Give classification of protein based on its composition.

B) Answer **any one** of the following : **10**

i) Explain Watson and Crick model of DNA with neat labeled diagram. Add a note on Z and A type of DNA.

ii) Define carbohydrate. Add a note on its classification.

PAPER – II
(Cell Physiology)

1. Rewrite the following sentences by using correct alternative : **5**

1) _____ is shoot inducing hormone.

a) Auxin b) Cytokinin c) ABA d) Ethylene

2) _____ is structural and functional unit of kidney.

a) Neuron b) Reflex arc c) Nephron d) Sarcomere

3) _____ is responsible for carry deoxygenated blood from right ventricle to lungs.

a) Pulmonary artery b) Pulmonary vein

c) Systemic artery d) Systemic aorta

4) _____ is responsible for absorption of water through nephrons.

a) Thyroxin b) ADH c) Aldosterone d) TSH

5) Thyrocalcitonin is secreted by _____ gland.

a) Thyroid b) Thymus c) Pancreas d) Pituitary

2. Answer the following (**any 5**) : **10**

   i) What is Phloem Transport ?

   ii) What is dedifferentiation and redifferentiation ?

   iii) Write a note on Fixation of Nitrogen.

   iv) Draw neat labeled diagram of Nephron.

   v) Explain Regulation of Respiration.

   vi) What is mechanism of hormone action ?

   vii) What is symplast pathway ?

3. A) Write short notes on **any two** of the following : **10**

   i) Describe types of transpiration.

   ii) Explain the structure and function of human respiratory system.

   iii) Describe human endocrine system with neat labeled diagram.

   B) Answer **any one** of the following : **10**

   i) Explain C3 and C4 pathway.

   ii) Describe human nervous system and add note on reflex action.

SLR-J – 18

Seat No.	

B.Sc. – I (Biotechnology) (Semester – II) (CGPA) Examination, 2016
BIOMETRY AND TISSUE CULTURE

Time : $2^1/_2$ Hours Max. Marks : 70

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) ***Draw*** *neat and labelled diagrams* ***wherever*** *necessary.*
3) Figures to ***right*** *indicates* ***full*** *marks.*
4) ***Use*** *of basic calculator is* ***allowed****.*
5) ***Use*** *graph paper* ***wherever*** *necessary.*

PAPER – I
(Biometry)

1. Rewrite the following sentences by using correct alternative. **5**

   1) The solution of the equation $2x^2 = 4$ is _____
      a) An imaginary number b) An integer
      c) A rational number d) An irrational number

   2) The conjugate of the complex number $6i - 5$ is _____
      a) $6i + 5$ b) $5 - 6i$ c) $-5 + 6i$ d) $-5 - 6i$

   3) If A = {6, 5, 4} and B = {2, 3, 4} then A – B = _____
      a) {6, 5} b) {6, 5, 3, 2} c) {4, 2, 0} d) {4, 2, Ø}

   4) If $f(x) = 2 \sin x$, then $f'(0)$ is _____
      a) 1 b) 2 c) 0 d) -2

   5) If A is matrix of order 2×3, B is matrix of order 3×2, then order of BA is _____
      a) 6×6 b) 3×6 c) 2×2 d) 3×3

2. Answer the following (**any 5**) : **10**

   i) State examples of discrete variable and continuous variable.

   ii) Find the value of $i^{24} + i^{25} + i^{26} + i^{27}$.

   iii) If A = {1, 2, 3, 4} and B = {3}, then find $A \times B$.

P.T.O.

iv) If $\lim_{x \to a} \frac{x^9 - a^9}{x - a} = 9$, find a.

v) If $y = 7x^2 \log x$, then find $\frac{dy}{dx}$.

vi) Evaluate the integral $\int \left(\frac{1}{x} + 3^x \right) dx$.

vii) If $A = \begin{bmatrix} 2 & 5 \\ 4 & 2x \end{bmatrix}$ is singular matrix, then find x.

3. A) Answer **any two** of the following : **10**

i) If $z_1 = 2 - 3i$ and $z_2 = 4 + i$, then find the values of $z_1 \cdot \overline{z_2}$ and $\frac{z_2}{z_1}$.

ii) If A = {1, 2, 3, 4}, B = {3, 4, 5, 6}, C = {4, 5, 6, 7, 8} and the universal set X = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, verify $A \cup (B \cap C) = (A \cup B) \cap (B \cup C)$.

iii) Evaluate $\lim_{x \to 0} \frac{\sqrt{x+5} - \sqrt{5}}{10x}$.

B) Answer **any one** of the following : **10**

i) Find the maximum and minimum value of the function $f(x) = 2x^3 + 3x^2 - 12x + 11$.

ii) If $A = \begin{bmatrix} 2 & 1 & 3 \\ 6 & 3 & 9 \\ 4 & 2 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 & 3 \\ -1 & 2 & 2 \\ 2 & 1 & -2 \end{bmatrix}$ find Rank of Matrix A and inverse of Matrix B.

PAPER – II
(Introduction to Tissue Culture)

1. Rewrite the following sentences by choosing correct alternatives. **5**

1) Highest concentration of auxin exist at the _____

a) Growing tips of plants b) Leaves

c) In xylem d) Base of any plant organ

2) In tissue culture inorganic and organic constituents of medium are expressed in mass values as _____

a) Fg/lit. b) mg/lit. c) pg/lit. d) ng/lit.

3) _____ of cultured cell is increased by attachment of cells to substrate.
   a) Growth b) Density c) Efficiency d) Encourage dependency

4) Most important protein required for growth of animal cell is _____
   a) Karetin b) Transferin c) Casein d) Albumin

5) _____ cells have finite life span on artificial medium.
   a) Normal b) Tumor c) Cancerous d) Defected

2. Answer the following (**any five**) : **10**

1) Write a note on media room in PTC.
2) Describe in brief gelling agent.
3) Write a note on artificial seed.
4) Define continuous cell line.
5) Explain in brief function of CO_2 incubator.
6) Write a short note on Natural media.
7) Define organ culture.

3. A) Answer the following (**any two**) : **10**

1) Discuss somatic embryogenesis.
2) Explain warm trypsinization.
3) Explain different methods of isolation of protoplast.

B) Answer the following (**any one**) : **10**

1) Explain laboratory design for animal tissue culture.
2) Discuss the role of different constituents of serum.

_____

SLR-J – 19

Seat No.	

B.Sc. – I (Semester – II) (Biotechnology) (CGPA) Examination, 2016
TAXONOMY AND COMPUTER SCIENCE

Time : 2½ Hours Max. Marks : 70

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*

PAPER – I (**Taxonomy**)

1. Choose the correct alternative from the following and rewrite the sentence. **5**

1) _____ is the amphibian of plant kingdom.

a) Pteridophyte b) Bryophyte

c) Angiosperm d) Gymnosperm

2) _____ are called as molds like bacteria.

a) Actinomycetes b) Archaebacteria

c) Mycoplasma d) Rickettsia

3) _____ is smallest unit of classification.

a) Class b) Family

c) Species d) Division

4) Which of the following includes in class Amphibia ?

a) Snake b) Sparrow

c) Fish d) Frog

5) Paramecium belongs to phylum

a) Arthropoda b) Protozoa

c) Mollusca d) Urochordata

P.T.O.

2. Answer **any five** of the following : **10**
   i) Enlist Principles of ICBN.
   ii) Mycoplasma.
   iii) Features of Agnatha.
   iv) Give Unites of Classification.
   v) What is Binomial nomenclature ?
   vi) Write a note on phenetic classification.
   vii) Economic importance of Algae.

3. A) Write short notes on **any two** of the following : **10**
   i) Give detail account on Archaebacteria.
   ii) Enlist merits and demerits of Bentham and Hookers System.
   iii) Salient features of Reptilia.

   B) Answer **any one** of the following : **10**
   i) Give detail account on Actinomycetes.
   ii) Explain five kingdom system with example.

PAPER – II (**Computer Science**)

1. Choose the correct alternative from the following and rewrite the sentence. **5**

   1) E-mail stands for
      a) Electronic mail b) Electronically mail
      c) Exchange mail d) None

   2) Operating system is
      a) Hardware b) Software
      c) Input device d) Output device

   3) _____ is a pictorial representation of logic flow of a program.
      a) Algorithm b) Chart
      c) Flowchart d) Pseudo code

   4) To open a file, the shortcut key is
      a) Ctrl+N b) Ctrl+S
      c) Ctrl+O d) Ctrl+P

   5) _____ is a widely used operating system.
      a) Unix b) Dos
      c) Windows d) None

2. Answer **any five** of the following : **10**

i) Explain any two methods to calculate total in Excel.

ii) Explain features of operating system.

iii) Enlist any four input devices.

iv) Explain need of database.

v) Define the following terms : 1) Data 2) Information

vi) Explain copy and paste operations in word.

vii) Explain Wide Area Network.

3. A) Write short notes on **any two** of the following : **10**

i) What is Computer ? Explain the parts of Computer.

ii) Define Algorithm and Flow chart. Explain the principles of algorithm.

iii) Explain Linux Operating System.

B) Answer **any one** of the following : **10**

i) What is Network Topology ? Explain its types with diagram.

ii) Explain History of Computers.

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SLR-J – 20

Seat No.	

B.Sc. II (Semester – III) (CGPA) Examination, 2016
BIOTECHNOLOGY
Inheritance Biology

Time : 2 Hours 30 Minutes Max. Marks : 70

***Instructions**: 1) **All** questions carry **equal** marks.*
*2) Figures to **right** indicate **full** marks.*
*3) Draw **neat** and labeled diagrams.*

1. Rewrite the following sentences by using correct alternative : **14**

1) Dihybrid phenotypic ratio in the F2 generation is
a) 9 : 3 : 3 : 1 b) 1 : 1 : 1 : 1 c) 9 : 3 : 4 d) 1 : 2 : 1

2) _____ different types of gametes were produced by trihybrid individual.
a) One b) Two c) Four d) Eight

3) Genes located on non-homologous region sex chromosomes are _____ linked.
a) Tightly b) Loosely c) Incompletely d) None of these

4) In incomplete dominance, the phenotypic ratio in F2 generation is
a) 9 : 3 : 3 : 1 b) 1 : 1 : 1 : 1 c) 9 : 3 : 4 d) 1 : 2 : 1

5) Plasmagenes are the units responsible for _____ inheritance.
a) Cytoplasmic b) Extranuclear c) Nuclear d) Both a and b

6) Petite mutants in the _____ were first discovered by B.Ephrussi.
a) bacteria b) maize c) yeast d) snail

7) One of the following is not an example of X linked inheritance.
a) Hemophilia b) Colorblindness
c) Hypertrichosis d) Night blindness

8) _____ is not an example natural transforming bacteria.
a) *B.subtilis* b) *H.influenzae*
c) *D.pneumoniae* d) *E.coli*

9) 'F' plasmids play important role in the _____ process.
a) Transduction b) Conjugation
c) Transformation d) Transcription

P.T.O.

10) In 1952 J. Lederberg and N. Zinder discovered process of _____ in bacteria.
   a) Transduction b) Transfection
   c) Transformation d) Transcription

11) Plama or extranuclear genes are located on
   a) Lysosomes and chloroplast b) Lysosomes and plasmids
   c) Ribosomes and chloroplast d) Mitochondria and chloroplast

12) On the non-homologous region of human Y chromosome _____ genes are present.
   a) Autosomal b) X-linked
   c) Holandric genes d) None of these

13) In complementary gene action, the ratio is
   a) 9 : 3 : 3 : 1 b) 9 : 7 c) 9 : 3 : 4 d) 13 : 3

14) The method of construction of maps of different chromosomes is called
   a) genetic mapping b) linkage mapping
   c) cross over map d) all of these

2. Answer the following **(any 7)** : **14**

i) What is incomplete dominance ?

ii) What are supplementary genes ?

iii) Give types of gene mapping.

iv) What is competence factor ?

v) What are F plasmids ?

vi) What are multiple alleles ?

vii) What are X linked genes ?

viii) What is sex chromosome ?

ix) Define linkage.

3. A) Answer the following **(any 2)** : **10**

i) Prove law of independent assortment with suitable example.

ii) Describe process of crossing over with neat labeled diagram.

iii) Explain genetic system in chloroplast.

B) Describe the Y linked inheritance with suitable examples. **4**

4. Answer **any two** of the following : **14**
   i) Describe mechanism of conjugation with neat labeled diagram.
   ii) Explain maternal inheritance with suitable examples.
   iii) Explain X linked inheritance with any two suitable examples.

5. Answer **any two** of the following : **14**
   i) Explain inhibitory and complementary gene action with suitable example.
   ii) Describe gene mapping by tetrad analysis.
   iii) Describe process of transformation in bacteria.

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SLR-J – 21

Seat No.	

B.Sc. II (Semester – III) (CGPA) Examination, 2016
BIOTECHNOLOGY
Cytogenetics and Population Genetics

Time : 2 Hours 30 Minutes Max. Marks : 70

Instructions : *1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicate **full** marks.*
*3) Draw **neat** labelled diagram **wherever** necessary.*

1. Choose and write a correct answer from given four alternatives : **14**

1) Mutation arise due to
   a) Infection by Micro organism
   b) Abrupt change in the genes
   c) Dominant character of one of the parents
   d) Nutritional factor

2) The ratio of the one allele to other allele in a gene pool or a population is called
   a) Gene Frequency b) Gene Flow
   c) Immigration d) Mutation

3) The mutagenicity of various chemicals is investigated by
   a) AME'S test b) Replica plate technique
   c) CIB technique d) Attached X Chromosome Technique

4) Genes located on the loops of the Lamp brush chromosomes is
   a) Holandric genes b) Sex linked genes
   c) Slave genes d) Jumping genes

5) The largest value is 175 and smallest value is 70, so the range of the number is
   a) 100 b) 70 c) 105 d) 175

P.T.O.

6) Mutual exchange of chromosome segments between non-homologous chromosomes is called

a) Duplication b) Deletion c) Translocation d) Inversion

7) LINES stands for

a) Long interspersed nuclear sequences

b) Large interspersed nuclear sequences

c) Long interrelated nuclear sequences

d) Large interrelated nuclear sequences

8) Chiasma formation is observed in _____ stage.

a) Pachytene b) Diplotene c) Leptotene d) Zygotene

9) Radocabbage is an example of

a) Autopolyploid b) Allopolyploid c) Polyploid d) Aneuploid

10) The Haploid Chromosome number in *Allium cepa* is

a) 6 b) 8 c) 14 d) 16

11) The "X" Chromosome is placed in _____ of the Human Karyotype Analysis.

a) Group B b) Group E c) Group C d) Group D

12) The commonly used absolute measure of dispersion is

a) Variance b) Range c) Mode d) Standard Deviation

13) When the Ratio of RNA and DNA is low cell initiates _____ division.

a) Mitosis b) Meiosis c) Amitosis d) Both (a) and (b)

14) Microsatellite was discovered by

a) Litt and Lutty b) Boveri and Sutton

c) Morgan and Lavan d) Tjio and Lavan

2. Solve **any seven** of the following : **14**

1) Define Transposition.

2) Define standard deviation.

3) What is Solenoid ?

4) What are Barr Bodies ?

5) What is a Heterochromatin ?
6) What are Sex Chromosomes ?
7) What is Lethal Mutation ?
8) Define Migration.
9) Define Aneuploidy.

3. A) Attempt **any two** of the following : **10**
   1) Describe the structure of Chromosome with a neat labelled diagram.
   2) "Heterochromatin is genetically inactive" substantiate the statement with examples.
   3) Write about the different types of transposons.

   B) Solve :

   Explain process of Mitosis and add a note on its significance. **4**

4. Attempt **any two** of the following : **14**
   1) Write in detail about the numerical changes in chromosome.
   2) Describe multiple factor hypothesis with suitable examples.
   3) Describe the Genetic basis of Evolution in Brassica and wheat.

5. Attempt **any two** of the following : **14**
   1) Write in detail Hardy-Weinberg law and its application.
   2) Explain in detail about Giant chromosomes with neat labeled diagram.
   3) Write a note on effects of environment on quantitative traits.

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SLR-J – 22

Seat No.	

B.Sc. – II (Semester – III) (CGPA) Examination, 2016
BIOTECHNOLOGY
Biophysical Instruments

Time : $2^{1}/_{2}$ Hours Max. Marks : 70

N.B. *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*
3) Draw ***neat*** *labelled diagrams* ***wherever*** *necessary.*

1. Choose and write correct answer from given **four** alternatives : **14**

1) _____ is the unit used for measurement of radioactivity.
   a) Joules b) Swedberg
   c) Paskle d) Grey

2) A density based separation of particles is performed by using _____ centrifugation.
   a) Preparative b) Analytical
   c) Isopycnic d) Rate zonal

3) Geiger Muller counter is used for measuring the _____
   a) Ionising radiations b) Fluorescence
   c) Dispersion d) Turbidity

4) Flow cytometry is the _____ based biophysical technique used in cell counting.
   a) Laser b) X-ray
   c) Gamma radiation d) Fluorescence

5) In electromagnetic wave, the oscillations are _____ to the direction of wave propagation.
   a) Parallel b) Right angles
   c) Perpendicular d) Left angles

6) Fixed angle rotors are designed to hold sample containers at a _____ angle relative to the central axis.
   a) Large b) Short c) Variable d) Constant

7) A density gradient of _____ is used for density based separation of DNA molecules by centrifugation.
   a) $CaCl_2$ b) $CsCl_2$
   c) $HgCl_2$ d) NaCl

8) In scanning electron microscopy the _____ electrons after sample interaction are detected.
   a) Transmitted b) Inhibited
   c) Absorbed d) Back scattered

9) Detection of elements by absorption of radiation by free atoms in gaseous state is practiced in _____
   a) X-ray diffraction b) AAS
   c) GM counting d) CD-ORD

10) Buffers keep the pH of a solution from changing by _____
   a) Converting strong acids to weak ones
   b) Converting weak acids to strong ones
   c) Converting weak bases to strong ones
   d) All of above

11) In the equation $A = \in bc$, what quantity is represented by "$\in$" ?
   a) Absorptivity b) Molar absorptivity
   c) Path length d) Concentration

12) The heaviest of the particle emissions are _____
   a) Beta particles b) Alpha particles
   c) Neutrons d) Gamma particles

13) Light pulses generated on release of photo electrons on incidence of radiations are detected in _____
   a) GM counter b) Scintillation counter
   c) Flow cytometry d) CD-ORD

14) Which of the following is not a part of the optical system of compound microscope ?
   a) Occular lens b) illuminator
   c) Condenser d) Fine adjustment

2. Solve **any seven** of following : **14**

   1) What are different regions of electromagnetic spectrum ?
   2) Define sedimentation and write its unit.
   3) What are stretching vibrations ?
   4) Write the principle of turbidometry.
   5) What is relative centrifugal force ?
   6) Give names of stains used in fluorescent microscopy.
   7) Define pH. What are different indicators used for pH measurement ?
   8) What are safety measures for handling of radioactive compounds ?
   9) Draw labelled diagram of “Flow Cytometry”.

3. A) Attempt **any two** of the following : **10**

      1) Write a note on circular dichorism and optical rotatory dispersion.
      2) Explain the nature of radioactivity. How does radioactivity react with matter ?
      3) Write a note on atomic absorption spectroscopy.

   B) Write the principle and applications of flow cytometry. **4**

4. Solve **any two** of the following : **14**

   1) Describe the instrumentation and applications of IR spectroscopy.
   2) Describe the optical principle and working of scanning and transmission microscopy.
   3) Describe pH measurement and the errors in it.

5. Solve **any two** of the following : **14**

   1) Describe the techniques used for detection of radioactivity.
   2) Write a note on the types of transitions in the electromagnetic spectrum.
   3) Derive an equation to explain the relationship of RPM and RCF.

SLR-J – 23

Seat No.	

B.Sc. – II (Biotechnology) (Semester – III) Examination, 2016
ANALYTICAL TECHNIQUES (CGPA)

Time : 2½ Hours Max. Marks : 70

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to ***right*** *indicate* ***full*** *marks.*
3) ***Draw*** *neat and labeled diagrams.*

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

1) β mercaptoethanol reduces _____ in protein structure.
   a) Carboxyl bonding
   b) Hydrogen bonding
   c) Methyl group
   d) Disulphide linkage

2) Characteristic feature of any form of chromatography is the _____
   a) use of molecules that are soluble in water
   b) use of an inert carrier gas
   c) use of a mobile and a stationary phase
   d) calculation of an R_f value for the molecules separated

3) In medicine _____ is used primarily to provide an artificial replacement for lost kidney function.
   a) Cell lysis b) Dialysis
   c) Haemolysis d) Catalysis

4) _____ is the physical method of cell disruption.
   a) Heat Shock b) Lysozyme
   c) Alkali d) Detergents

5) Biotinylated probe is used in _____ blot technique.
   a) Peptide b) Dot
   c) Protein d) DNA

P.T.O.

6) A new youth drink contains sugar, salt, alcohol and vitamin C. A gas chromatogram could be used to determine the _____
   a) alcohol content only
   b) alcohol, sugar and vitamin C content only
   c) alcohol and sugar content only
   d) concentration of all ingredients in the drink

7) _____ gives information needed for the synthesis of oligonucleotide.
   a) Blocking b) Microsequencing
   c) Blotting d) Macrosequencing

8) SDS an _____ detergent used for cell disruption.
   a) Anionic b) Cationic
   c) Amniotic d) Neutral

9) Quantitative totality of the total protein concentration of cell is known as _____ of the cell.
   a) Protein mapping b) Genomics
   c) Proteomics d) Proteome

10) FC reagent used in _____ assay for protein estimation.
   a) BCA b) Bradford
   c) Lowry d) Biurette

11) _____ method is used for estimation of DNA.
   a) Orcinol b) DPA
   c) DNSA d) Anthrone

12) pH of the separating gel is _____
   a) 8.3 b) 7.3
   c) 6.3 d) 8.0

13) Partition coefficients are inversely proportional to the _____ of the analyte in GLC.
   a) Concentration b) Type
   c) No. of side chains d) Volatility

14) BCA Assay also known as _____
   a) Goel's Assay b) Benjamin's Assay
   c) Smith's Assay d) Carrel's Assay

2. Answer the following **(any seven)** : **14**
   1) Write a note on polyacrylamide as support media.
   2) Draw neat and labeled diagram of descending chromatography.
   3) Explain Homogenization as a method of cell disruption.
   4) Write a short note on ester value of fat.
   5) Write a note on proteomics.
   6) Explain how EDTA carries cell disruption.
   7) Explain the principle of resorcinol method.
   8) Describe Hydrazine method of C-terminal sequencing.
   9) Enlist the limitations and advantages of Lowery assay.

3. A) Answer the following **(any two)** : **10**
      1) Describe Northern blotting.
      2) Explain in detail HPLC.
      3) Discuss in detail dialysis.

   B) Discuss the principle and working of Autoradiography technique. **4**

4. Answer the following **(any two)** : **14**
   1) Write a note on resorcinol method of carbohydrate estimation.
   2) Explain in detail how will you prepare sample for MALDI.
   3) Discuss in detail disc gel electrophoresis.

5. Answer the following **(any two)** : **14**
   1) Describe gel permeation chromatographic technique for separation of molecule.
   2) Discuss BCA assay for protein estimation for protein with advantages and disadvantages.
   3) Explain in detail Carboxyterminal sequencing.

SLR-J – 24

Seat No.	

B.Sc. II (Semester – III) (CGPA) Examination, 2016
BIOTECHNOLOGY
Immunology – I

Time : 2½ Hours Max. Marks : 70

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*

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

3) Draw net labeled diagrams ***wherever*** *necessary.*

1. Choose the correct alternative and rewrite the sentences again : **14**

i) Spread of viral infection is avoided by _____ as a member of innate immunity.

a) Interleukin b) Interferon

c) Chemokine d) Tumor necrosis factor

ii) Unfavorable environment is created for the growth of other microbes by Lactobacillus in the vigina by degrading

a) Uric acid b) Lactoferrin c) Sebum d) Glycogen

iii) Cytotoxic T Lymphocytes (CTLs) will kill target or self-altered cells using

a) Fas pathway b) Perforin/Granzyme pathway

c) Both pathways d) None of these pathway

iv) Predominantly formed antibody in primary immunity is

a) IgE b) IgG c) IgA d) IgM

v) In humoral immunity, interaction of CD40 and CD40L provides second signal, while _____ interaction provides co-stimulation to T_H cells.

a) MHC-TCR b) B7-CD28 c) BCR-TCR d) BCR-TLR4

vi) In secondary immune response initiation of antibody production starts from

a) Memory cells b) B clone cells

c) T_H cells d) T_C cells

vii) Serotonin, primary mediator of anaphylaxis is formed by decarboxylation of

a) Alanine b) Histidine c) Tryptophan d) Lysine

P.T.O.

viii) Thyrotoxicosis results from autoimmune attack against the _____ receptor.

a) Acetylcholine b) Insulin

c) Thymic hormone d) Thyroid-stimulating hormone

ix) Major changes in the antigenic structure of influenza viruses are called

a) Antigenic variation b) Signal transduction

c) Antigenic shift d) Attenuation

x) *Pseudomonas aeruginosa* secretes _____ enzyme, which degrades the IL-2.

a) Protease b) Lipase c) Decaroxylase d) Amylase

xi) To evade from immune response _____ hide or lose their antigens.

a) Bacteria b) Viruses c) Fungi d) Helminthes

xii) In AB blood group individual _____ isoantibodies observed.

a) Anti -A b) Anti-B c) Anti-A/B d) None

xiii) _____ gene is involved in mutation that makes herpes or vaccinia virus avirulent.

a) Thymidine kinase b) Envelope

c) Capsomere d) Polymerase

xiv) _____ will be used for fusion of B lymphocytes and Myeloma cells in Hybridoma technique.

a) HGPRT b) PEG c) Ig d) HAT

2. Define and explain **any seven** of the following : **14**

i) Inflammation.

ii) Secondary immunity.

iii) T cell independent antigen.

iv) Granzyme proteins.

v) Drug induced allergy.

vi) Indirect Coomb's test.

vii) Hybridoma technology.

viii) Specific immunity.

ix) ABO blood group.

3. A) Answer **any two** of the following : **10**
   i) What is autoimmunity ? Explain organ specific autoimmune diseases.
   ii) Write in detail on immunity to bacteria.
   iii) Write in brief on Rheumatiod arthritis.

   B) Write an essay on immune complex mediated hypersensitivity. **4**

4. Answer **any two** of the following : **14**
   i) Explain Cell-mediated Immune response in detail.
   ii) Write an essay on types of vaccines.
   iii) Write an essay on second line of defense.

5. Answer **any two** of the following : **14**
   i) Explain Humoral Immune response in detail.
   ii) Write an essay on monoclonal antibody production and its applications.
   iii) Write an essay on Type I Hypersensitivity.

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SLR-J – 25

Seat No.	

B.Sc. (Part – II) (Semester – III) (CGPA) Examination, 2016
BIOTECHNOLOGY
Immunology – II

Time : 2 ½ Hours Max. Marks : 70

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Draw neat and labelled diagrams ***wherever*** *necessary.*

1. Rewrite the following sentences by choosing the correct alternative given below : **14**

i) Most abundant class of immunoglobulin found in body is _____
a) IgM b) IgA c) IgD d) IgG

ii) The smallest unit of antigenicity is _____
a) Epitope b) Adjuvant c) Hapten d) Antibody

iii) Widal test is example of _____ type of reaction.
a) Agglutination b) Precipitation
c) Flocculation d) Complement fixation

iv) The reaction between soluble antigen and antibody leads to _____
a) Precipitation b) Agglutination
c) Complement fixation d) None of these

v) _____ glycoprotein acts as antiviral agents that inhibit intracellular viral replication.
a) lysozyme b) Interferon c) Fibronectin d) None of these

vi) _____ test is used in diagnosis of Enteric fever.
a) VDRL b) Tuberculin c) Widal d) Mantoux

vii) Serological tests that makes use of fluorescent dyes is called _____
a) Precipitation b) ELISA
c) Immunofluorescence d) Radioimmunoassay

P.T.O.

viii) Antibodies labeled with enzymes are used in _____ test.

a) Immunofluorescence b) ELISA

c) Complement fixation d) agglutination

ix) The antigens involved in the rejection of graft are called _____

a) Autoantigens b) Heterophile antigens

c) MHC antigen d) Proantigen

x) In alternate pathway binding of _____ stabilizes the C_3bBb.

a) Serine protease b) Lectin

c) Properdin d) C1

xi) Horny outer layer of the skin called stratum corneum is made from _____

a) Sebum b) Fatty acid c) Keratin d) Cartilage

xii) In cell-mediated immunity _____ will perform role in target cell killing.

a) Perforins b) Granzymes c) Fragmentins d) All of these

xiii) _____ is example of primary lymphoid organ.

a) Bone marrow b) Lymph node c) Spleen d) MALT

xiv) The most important cells involved in the destruction of virus infected cells are _____

a) B cells b) Macrophages

c) Cytotoxic T cells d) T_H cells

2. Answer **any seven** of the following : **14**

i) Opsonization.

ii) Give types of Antigen.

iii) Define Hematopoiesis.

iv) Define Antibody and give its types.

v) Give factors affecting innate immunity.

vi) Give names of primary lymphoid organs and its function.

vii) Define Agglutination and give examples of agglutination test.

viii) Apoptosis.

ix) Immunological specificity.

3. A) Answer **any two** of the following : **10**
   i) Write an account on process of hematopoiesis.
   ii) Give Properties of cytokines.
   iii) Write note on Radioimmunoassay.

   B) Explain structure and function of thymus. **4**

4. Answer **any two** of the following : **14**
   i) Write an account on lymphoid cells of immune system.
   ii) Factors affecting antigenicity.
   iii) Explain mechanism of classical complement pathway.

5. Answer **any two** of the following : **14**
   i) Write principle of antigen-antibody interactions.
   ii) ELISA.
   iii) Write brief account on processing and presentation of exogenous antigen.

SLR-J – 26

Seat No.	

B.Sc. – II (Semester – IV) (CGPA) Examination, 2016
BIOTECHNOLOGY
Molecular Biology – I (New)

Time : $2^{1}/_{2}$ Hours Max. Marks : 70

N.B. *: 1)* ***All*** *questions are* ***compulsory****.*
2) ***Draw*** *figures* ***neatly*** *and label it.*

1. Choose and write the correct answer from the given four alternatives : **14**

1) Replication which involves one strand of the parent and the other which is synthesized a new is called _____

a) Conservative b) Semiconservative

c) Dispersive d) Non-dispersive

2) The double helical structure of DNA was proposed by _____

a) Watson and Crick b) Beadle and Tautum

c) Wilkins and Rosalind Franklin d) Hershey and Chase

3) Replication of DNA begins at a Fixed Point called _____

a) Ori C b) Dna C

c) Dna B d) Ori B

4) Rolling circle mode of replication has been observed in _____

a) Plasmid b) Cosmid

c) Both Plasmid and Cosmid d) Plasmid and Phages

5) The first evidence to show that E. Coli Chromosomes is circular, Double stranded was provided by _____

a) J. Cairns b) Korenberg

c) Okazaki d) Fredrick

6) The technique adapted to study the process of replication in Vicia faba was _____

a) Autoradiography b) Microscopy
c) Staining d) Both a) and b)

7) The Eukaryotic DNA is Tightly Bound to Histone to form _____

a) Nucleosome b) Chromosome
c) Ribosome d) Polysome

8) Circular DNA molecules in E. Coli is compacted through the process of _____

a) Twisting b) Supercoiling
c) Relaxing d) Nicking

9) Viruses contain _____ as genetic material.

a) RNA b) DNA
c) Both RNA and DNA d) Heterogenous RNA

10) The bond formed by a esterified phosphate and the sugar of different nucleotide is _____

a) Hydrogen bond b) Disulphide bond
c) Covalent Bond d) Phosphodiester Bond

11) The G ≡ C percent at 70°C Melting Temperature is _____

a) 50% b) 35%
c) 25% d) 55%

12) One kilobase of DNA is _____

a) 1000 bp b) 10 bp
c) 100 bp d) 10,000 bp

13) The termination codons of the genetic code are _____

a) UAG, UGA, UAA b) UCU, UCC, UCA
c) AGU, AGC, AUG d) UCU, AGC, UCC

14) In Eukaryotes RNA primer for both leading and lagging strand is synthesized by _____

a) DNA polymerase α b) DNA polymerase β
c) DNA polymerase γ d) DNA polymerase Σ

2. Solve **any seven** of the following : **14**
   1) Define Denaturation.
   2) Define Genetic Code.
   3) Define Recombination.
   4) Define supercoiling.
   5) Define Semiconservative Replication.
   6) Define Melting Temperature.
   7) Write any two differences between B-DNA and Z-DNA.
   8) Write the function of enzyme nuclease.
   9) Define DNA damage.

3. A) Attempt **any two** of the following : **10**
      1) Write about the contribution of Fredrick Griffith regarding the identification of the genetic material.
      2) Write in detail about the Z forms of DNA with diagram.
      3) Write about the organization in Eukaryote with diagram.

   B) Solve :

      Write about the characteristic feature of Watson and Crick Model with neat diagram. **4**

4. Attempt **any two** of the following : **14**
   1) Explain genetic code with its properties.
   2) Write about cot curves and its analysis.
   3) Write in detail about the Rolling circle model of replication with neat diagram.

5. Attempt **any two** of the following : **14**
   1) Write in detail about the enzymology of DNA replication in Prokaryotes.
   2) Explain in detail about Recombination and excision DNA repair.
   3) Write in detail about chloroplast DNA and its application with neat labelled diagram.

SLR-J – 27

Seat No.	

B.Sc. – II (Biotechnology) (Semester – IV) (CGPA) Examination, 2016
MOLECULAR BIOLOGY – II (New)

Time : 2½ Hours Total Marks : 70

Instructions : *1)* ***All*** *questions carry* ***equal*** *marks.*
2) Figures to ***right*** *indicate* ***full*** *marks.*
3) Draw ***neat*** *and labeled diagrams.*

1. Rewrite the following sentences by using correct alternative : **14**

1) In lac operon, β-galactosidase enzyme is encoded from _____ gene.
   a) lac 'a' b) lac 'b' c) lac 'z' d) lac 'y'

2) _____ is act as initiator tRNA molecule in prokaryotic translation process.
   a) $tRNA^{met}$ b) $tRNA^{fmet}$ c) $tRNA^{pro}$ d) $tRNA^{val}$

3) _____ enzyme synthesizes polypeptide bond during translation process.
   a) Aminoacyl tRNA synthetase b) DNA glycosylase
   c) Peptidyl di-sulphide isomerase d) Peptidyl transferase

4) Clover leaf model of tRNA was proposed by _____
   a) Robertson b) R. Holly c) Hoagland d) W. M. Nirenberg

5) Initiation codon AUG specify _____ amino acid in prokaryotes.
   a) Methionine b) Valine
   c) Glycine d) Formulated methionine

6) Heat shock genes are expressed in response to an exposure to elevated temperatures in *E.coli* and encodes _____
   a) Chaperons b) Histones c) Nucleases d) Proteases

7) In eukaryotes, tRNA is transcribed by _____
   a) RNA Polymerase α b) RNA Polymerase II
   c) RNA Polymerase III d) RNA Polymerase I

8) In prokaryotes, transcription process is initiated by _____
   a) Sigma factor b) Rho factor c) Pol-α d) Core enzyme

P.T.O.

9) In eukaryotes, during mRNA processing introns are removed by _____ process.
   a) Capping b) Polyadenylation
   c) Splicing d) All of these

10) _____ sequences are present at ribosome binding site on the mRNA molecule.
   a) Consensus b) Promoter
   c) Shine-Dalgarno d) None of these

11) Operon model was proposed by _____
   a) Watson and Crick b) Lederberg and Tatum
   c) Singer and Nicholson d) Jacob and Monod

12) The first evidence that RNA molecules were capable of catalyzing chemical reactions was obtained _____
   a) T. H. Morgan b) R. H. Herald
   c) Thomas Cech d) H. G. Khorana

13) Many ribosomes are attached along the length of the mRNA molecule, this complex of ribosomes and mRNA is called as _____
   a) Spliceosome b) Polysome
   c) Enhanceosome d) Replisome

14) Acetyl groups are added to specific lysine residues on the core histones by a family of enzymes called _____
   a) histone acetyltransferases
   b) histone transacetylases
   c) histone methylases
   d) histone methyltransferases

2. Answer the following (**any 7**) : **14**

   i) What is a promoter sequence ?
   ii) Write a note on operon concept.
   iii) What are split genes ?
   iv) What are introns ?
   v) What are transcriptional repressors ?

vi) What is TBP ?

vii) What is attenuation ?

viii) Write a note on fidelity of translation.

ix) What are translational drugs ?

3. A) Answer the following (**any 2)** : **10**

i) Describe regulation of translation in eukaryotes.

ii) Explain mRNA processing in eukaryotes.

iii) Explain structure of tRNA molecule.

B) Describe types and functions of RNA polymerases. **4**

4. Answer **any two** of the following : **14**

i) Describe enzymology and mechanism of transcription in eukaryotes.

ii) Describe regulation of trp operon in bacteria.

iii) Describe process of translation in eukaryotes.

5. Answer **any two** of the following : **14**

i) Explain post-translational modifications in proteins.

ii) Describe enzymology and mechanism of transcription in prokaryotes.

iii) Describe regulation of transcription in eukaryotes with any two suitable examples.

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SLR-J – 28

Seat No.	

B.Sc. (Part – II) (Semester – IV) (CGPA) (New) Examination, 2016
BIOTECHNOLOGY
Plant Tissue Culture

Time : 2 Hours 30 Minutes Max. Marks : 70

***N.B.** : 1) Figures to the **right** indicate **full** marks.*
*2) Draw a **neat**, well labelled, complete diagram **wherever** necessary.*
*3) **All** questions are **compulsory** and carry **same** marks.*

1. Rewrite the following sentences by using correct alternative. **14**

i) Development of an embryo from an unfertilized egg is the process of
   a) embryo culture b) parthenogenesis
   c) somaclonal variation d) organogenesis

ii) _____ enzymes are used for isolation of protoplast by enzymatic method.
   a) Cellulases b) Macerozymes
   c) Pectinases d) All of these

iii) During protoplast fusion, the chemical agent which is used for induced fusion is called as
   a) mutagen b) fusagen c) indugen d) osmoticum

iv) The part of a plant used for culturing is called
   a) callus b) cell suspension
   c) stock d) explant

v) Ethylene is employed for
   a) ripening of fruit b) stimulation of cell division
   c) increased light d) root growth

vi) Virus free plants can be obtained through _____ culture technique.
   a) meristem b) callus c) protoplast d) anther

P.T.O.

vii) The phenomenon of suppression of growth of an axillary bud in the presence of the terminal bud on the branch is known as _____.

a) organogenesis b) parthenogenesis

c) somaclonal variation d) Apical dominance

viii) A nonsexual developmental process that produces a bipolar embryo with a closed vascular system from somatic tissues of a plant is called _____.

a) embryo culture b) somatic embryogenesis

c) somaclonal variation d) organogenesis

ix) _____ is one of the growth hormones used to manipulate plant tissue.

a) Thiamine b) Pyridoxine c) Kinetin d) Nicotinic acid

x) Sterilization of nutrient media is carried out at _____ conditions of temperature and pressure.

a) 27°C, 1 atmosphere b) 37°C, 60%

c) room temperature, vacuum d) 121°C, 15 psi

xi) For protoplast culture _____ medium is used.

a) Nagata and Takebe b) White

c) Haberlandt d) MS

xii) Elements required by plants in higher concentration than 0.5 mmol/liter referred as

a) vitamins b) cofactors

c) macromolecules d) micromolecules

xiii) Auxins are synthesized in higher concentration at _____ region.

a) shoot apex b) root c) branches d) internode

xiv) _____ are gelling agents used for solidifying media.

a) Agar b) Agarose c) Gelrite d) All of these

2. Answer **any seven** of the following : **14**

   i) What is an embryoid ?

   ii) Define micropropagation.

   iii) Define artificial seed.

   iv) What is an explant ?

   v) Define totipotency.

   vi) What is meant by incineration ?

   vii) Mention any two surface sterilizing agents used for Plant Tissue Culture.

   viii) Differentiate between embryo culture and somatic embryogenesis.

3. A) Answer **any two** of the following : **10**

      i) Explain in brief – Protoplast fusion.

      ii) Explain in brief – Somaclonal variation.

      iii) Write a note on Culture media used in Plant Tissue Culture.

   B) Explain in brief callus culture in *Daucuscarota* **4**

4. Answer **any two** of the following : **14**

   i) Explain in brief the isolation of protoplast.

   ii) Give a detailed account on – cell suspension culture.

   iii) Describe anther and pollen culture for production of haploid plants.

5. Answer **any two** of the following : **14**

   i) Give a detailed account on – Micropropagation.

   ii) Explain in detail about General Plant Tissue Culture Laboratory design and equipment used in Plant Tissue Culture.

   iii) Give a detailed account on – somatic embryogenesis.

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SLR-J – 29

Seat No.	

B.Sc. (Biotechnology) (Semester – IV) Examination, 2016
ANIMAL TISSUE CULTURE (CGPA) (New)

Time : 2½ Hours Max. Marks : 70

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to ***right*** *indicate* ***full*** *marks.*
3) ***Draw*** *neat and* ***labeled*** *diagrams.*

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

1) Cells removed from animal tissue will continue to grow if supplied with nutrients and growth factors. Process is known as _____

a) Animal cell culture b) Plant cell culture
c) Yeast cell culture d) Fungus cell culture

2) Hella cell line is derived from _____ cell line.

a) Stomach cancer b) Cervical cancer
c) Lung cancer d) Blood cancer

3) Which of the following behavior not shown by normal cell in culture ?

a) Contact inhibition b) Monolayer formation
c) Uncontrolled cell division d) Encourage dependent

4) _____ cells have finite life span.

a) Tumor b) Cancerous c) Transformed d) Normal

5) Plasma clot technique is also known as _____ technique.

a) Watch glass b) Grid
c) Raft d) Cyclic exposure

6) In natural media most widely used biological fluid as media is _____

a) Plasma clot b) Serum
c) Coconut milk d) Clots

7) When all the cells in culture are in same phase of growth; the process is known as _____

a) Trypsinization b) Primary cell culture

c) Cell synchronization d) Apoptosis

8) Most cell lines grow well at pH _____

a) 7.1 b) 7.2 c) 7.3 d) 7.4

9) _____ Portion of skin is used to produce artificial skin.

a) Epidermis b) Dermis c) Epithelial d) Endothelial

10) _____ is often added to the cell suspension before viable counting.

a) Gram stain b) Trypan blue

c) Crystal violet d) Fluorescein

11) The _____ content of diploid cells is usually constant, although variations can occur in other content of cells through the cell cycle.

a) Protein b) Lipid c) DNA d) Carbohydrates

12) A colorimetric assay for viable cells has been developed by using _____ dye.

a) CTT b) GTT c) MTT d) None of the above

13) _____ technique is well known in forensic science but is gradually adopted as a standard reference technique for cell line identity in culture collection.

a) DNA fingerprinting b) Karyotyping

c) LDH assay d) Lowry assay

14) _____ involves the exposure of the cell suspension to a high voltage electrical impulse.

a) Encapsulation b) Electroporation

c) Liposome d) Protoplast

2. Answer the following (**any seven**) : **14**

1) Enlist the characteristics of animal cells in culture.

2) Describe in brief Laminar air flow.

3) Define primary cell culture.

4) How will you select cell line for culture ?

5) Write a note on natural media.
6) Define cell synchronization.
7) Write a note on cell determination by protein.
8) Give brief account on purpose of use of bioreactor for animal cell.
9) Write a short note on BSS.

3. A) Answer the following (**any two**) : **10**
   1) Explain karyotyping for identification of cell lines.
   2) Describe cell counting and monitoring.
   3) Explain mechanical methods for cell separation.

   B) Write a note on history of ATC. **4**

4. Answer the following (**any two**) : **14**
   1) Describe in detail serum containing media.
   2) Explain laboratory design for ATC.
   3) Give details of efficiency and productivity of a culture system.

5. Answer the following (**any two**) : **14**
   1) Give details of cold trypsinization.
   2) Describe glycoprotein production from mammalian cells.
   3) Give details of different techniques of organ culture.

SLR-J – 30

Seat No.	

B.Sc. (Part – II) (Semester – IV) (CGPA) Examination, 2016
BIOTECHNOLOGY (New)
Bioenergetics and Enzymology

Time : 2½ Hours Max. Marks : 70

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*

2) ***All*** *questions carry* ***equal*** *marks.*

3) Draw ***neat*** *and labelled diagrams* ***wherever*** *necessary.*

1. Rewrite the following sentences by choosing the most correct alternative given below : **14**

i) In digit Enzyme Commission number the second place indicates

a) Class b) Sub-class

c) Sub sub-class d) Serial number

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

a) Activation b) Binding c) Gibb's free d) Free

iii) Km represents the

a) Substrate concentration at maximum velocity

b) Substrate concentration in active site

c) Substrate concentration at half of maximum velocity

d) Substrate specificity of an enzyme

iv) _____ is equivalent to the number of substrate molecules converted to product in a given unit of time on a single enzyme molecule when the enzyme is saturated with substrate.

a) Specific activity b) Enzyme activity

c) Turnover number d) Percent purity

v) The catalytic activity of enzyme is restricted to its small portion called as _____ site.

a) Passive b) Active

c) Allosteric d) Regulatory

P.T.O.

vi) For allosteric enzymes the substrate concentration against velocity gives _____ curve.

a) Parabolic b) Hyperbolic c) Ellipsoidal d) Sigmoidal

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

a) Non-competitive b) Mixed type

c) Uncompetitive d) Competitive

viii) The statement that in all natural processes, the entropy of universe increases is given by _____ law of thermodynamics.

a) 1^{st} b) 2^{nd} c) 3^{rd} d) Both 1^{st} and 2^{nd}

ix) _____ reaction is considered as oxidation.

a) Fe^{3+} + electron $\rightarrow Fe^{2+}$ b) Cu^{2+} + electron $\rightarrow Cu^{+}$

c) $Fe^{2+} \rightarrow Fe^{3+}$ + electron d) $Fe^{2+} \leftarrow Fe^{3+}$ + electron

x) The standard free energy change of hydrolysis of ATP to ADP is _____ KJ/mole.

a) – 7.3 b) – 15.7 c) – 30.5 d) – 35

xi) The enzyme above their optimum temperature losses the activity because of _____ protein.

a) Denaturation b) Renaturation

c) Precipitation d) Isomerization

xii) Among the following _____ has highest group transfer potential.

a) 1, 3-Bisphosphoglycerate b) Creatinine phosphate

c) Carbamyl phosphate d) Phosphoenol pyruvate

xiii) _____ coenzyme is involved in electron transfer reactions.

a) TPP b) Cobamide c) NAD^{+} d) Terahydrofolate

xiv) The electron affinity of electron acceptor in redox conjugate pair is measured in terms of

a) Volts b) Ampere c) Calorie d) Jule

2. Answer **any seven** of the following : **14**

a) Define free energy and standard free energy.

b) What is isomerization ? Give an example.

c) What is coenzyme ? Give two examples.

d) Distinguish between enzyme catalyzed and uncatalyzed reaction.

e) Write a note on activators of enzyme.

f) Give Lineweaver Burk equation.

g) What is isoenzyme ?

h) Write a note on activation of latent enzyme.

i) Give any two biological role of enzymes.

3. A) Answer **any two** of the following : **10**

a) Write a note on ribozyme.

b) Discuss the uncompetitive and non-competitive inhibition.

c) Explain in detail the enzyme specificity.

B) Discuss the Lock and key hypothesis and induced fit model. **4**

4. Answer **any two** of the following : **14**

a) Explain the relationship between equilibrium constant and standard free energy change of reaction.

b) Discuss about redox potential and its measurement.

c) Derive Michaelis-Menten equation for single substrate.

5. Answer **any two** of the following : **14**

a) Write a note on effect of temperature, substrate concentration and pH on enzyme activity.

b) Explain the isoenzyme form of LDH and give its clinical importance.

c) Discuss the IUB classification and nomenclature of enzyme.

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SLR-J – 31

Seat No.	

B.Sc. II (Semester – IV) (CGPA) Examination, 2016
BIOTECHNOLOGY
Metabolism (New)

Time : 2 Hours 30 Minutes Marks : 70

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicate **full** marks.*
*3) Draw **neat** and labeled diagram.*

1. Rewrite the following sentence by using correct alternative : **14**

1) Glucose 1 phosphate and glucose 6 phosphate can be interconveted by _____

a) Glucose phosphate isomerase b) Phosphoglucomutase
c) Phosphohexose isomerase d) Glucose phosphate racemase

2) Oxidation of fatty acids occurs _____

a) On the microsomes
b) In the cytosol
c) On the inner mitochondrial membrane
d) In the matrix of mitochondria

3) Photorespiration yields _____

a) Phosphoglycerate b) Phosphoglycolate
c) Both a and b d) None of these

4) The end product of fermentation of molasses by yeast is _____

a) Methyl alcohol b) Pyruvate
c) Ethyl alcohol d) Lactic acid

5) _____ is called the complex I of electron transport chain in mitochondria.

a) Succinate Q reductase b) Cytochrome reductase
c) Cytochrome oxidase d) NADH Q reductase

6) Increase concentration of _____ inhibits the beta oxidation of fatty acids.
   a) ATP b) OAA c) Malonyl CoA d) Citrate

7) _____ contribute nitrogen atoms in the biosynthesis of purine and pyrimidine ring.
   a) Aspartate b) Carbamoyl phosphate
   c) Carbon dioxide d) Glutamine

8) Light rays consists of tiny particles called _____
   a) Stroma b) Granna c) Photon d) Quantum

9) Which of the following substances is/are ketogenic ?
   a) Fatty acids b) Leucine c) Lysine d) All of these

10) Electron flow in cytochrome oxidase is blocked by _____
   a) CN^- b) $N3^-$ c) CO^- d) All of these

11) Ketone bodies are formed due to _____
   a) Breakdown in the beta oxidation pathway
   b) Inhibition of fatty acid activation and transport
   c) Channelisation of oxaloacetate from citric acid cycle to gluconeogenesis
   d) Inhibition of cAMP production

12) _____ is the substrate for starch synthesis in plant plastids.
   a) UMP glucose b) UDP fructose
   c) UMP galactose d) ADP glucose

13) The reaction of conversion of isocitrate to alpha ketoglutarte in TCA cycle is _____
   a) Oxidative decarboxylation
   b) Condensation
   c) Dehydrogenation
   d) Substrate level phosphorylation

14) Urea cycle is also called as _____
   a) Cori cycle b) Kerb's – Henseleit cycle
   c) Calvin cycle d) None of these

2. Answer the following (**any 7**) : **14**

   1) What are spingolipids and glycolipids and give example of each ?

   2) Define glycogenesis.

   3) Define photosynthesis and give its reactions.

   4) What is meant by salvage and de novo pathway of nucleotide biosynthesis ?

   5) Illustrate the alcoholic fermentation.

   6) What are uncouplers and give its example ?

   7) Draw the structure of cholesterol.

   8) How the fatty acids are transported across mitochondria ?

   9) Non cyclic electron transport in photosystem.

3. A) Answer the following (**any 2**) : **10**

      1) Explain the Hatch Slack pathway.

      2) Give detail account on Urea cycle.

      3) Explain in detail Rubisco enzyme.

   B) Explain in detail the transport of NADH/FADH2 from cytosol to mitochondria. **4**

4. Answer **any two** of the following : **14**

   1) Explain HMP shunt.

   2) What is β oxidation and explain β oxidation of odd chain fatty acid.

   3) What is oxidative phosphorylation and explain the mechanism of it ?

5. Answer **any two** of the following : **14**

   1) Give the outline of amino acid synthesis.

   2) Give detail account on de novo synthesis of purine.

   3) Write on glycolysis and give regulation.

SLR-J – 32

Seat No.	

B.Sc. – II (Semester – IV) (Biotechnology) (Old) Examination, 2016
MOLECULAR BIOLOGY
Molecular Biology of Gene

Time : 2 Hours Max. Marks : 50

N.B. *: 1)* ***All*** *questions are* ***compulsory****.*
2) Draw ***neat*** *and labelled diagram* ***wherever*** *necessary.*

1. Rewrite the sentences using correct alternatives : **10**

1) _____ is the usual method of DNA Replication.
   a) Conservative b) Semi Conservative
   c) Dispersive d) Non Conservative

2) Viruses contain _____ as Genetic material.
   a) RNA b) DNA
   c) hn RNA d) Both RNA and DNA

3) Replication of DNA begins at a fixed point called _____
   a) OriC b) DnaC
   c) DnaB d) OriB

4) Proof Reading is brought about in Prokaryotes by _____ enzyme.
   a) DNA Ploymerase III b) DNA Polymerase I
   c) DNA Polymerase II d) DNA Polymerase I and II

5) Nitrogenous Bases of RNA are _____
   a) AUTG b) AUCG
   c) AUTC d) ATCG

6) Leading strand during DNA Replication is formed _____
   a) Continuously b) Discontinuously
   c) Semi-Discontinuously d) In short pieces

7) The enzyme that plays important role in recombination is _____
   a) Rec A b) Lec A c) Glycolases d) Endonucleases

8) The distance between each nucleotide in DNA is _____

a) 2.4 Å b) 3.4 Å c) 4.3 Å d) 3.6 Å

9) The Termination Codons in Genetic Code are _____

a) UAG, UGA, UAA b) UCU, UCC, UCA

c) UCU, AGC, UCC d) UGU, AGC, AUG

10) One kilobase of DNA is _____

a) 1000 bp b) 10 bp c) 100 bp d) 10,000 bp

2. Answer the following **(any 5)**. **10**

1) What is central dogma ?
2) What are Okazaki-Fragments ?
3) Define Bidirectional Replication.
4) Define Gene.
5) Define DNA Repair.
6) Define Mutagen.

3. A) Answer the following **(any 2)** : **6**

1) What is RNA ? Describe its structure.
2) Write about the structure of Mitochondrial DNA.
3) Write about the different types of DNA.

B) Write in detail about the different Modes of Replication with diagram. **4**

4. Answer the following **(any 2)** : **10**

1) Write in detail the structure proposed by Watson and Crick.
2) Write about the properties of Genetic-Code.
3) Describe D-loop model of Replication.

5. Answer the following **(any 2)** : **10**

1) Describe in brief various types of DNA Repair.
2) Write a note on Prokaryotic DNA Polymerases.
3) Explain in detail about DNA Replication in Eukaryotes with neat labelled diagram.

_____

SLR-J – 33

Seat No.	

B.Sc. II (Biotechnology) (Semester – IV) (Old) Examination, 2016
MOLECULAR BIOLOGY
Gene Regulation

Time : 2 Hours Max.Marks : 50

Instructions : *1)* ***All*** *questions carry* ***equal*** *marks.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*
3) Draw ***neat*** *and labelled diagrams* ***wherever*** *necessary.*

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

1) Initiation codon is present on _____ end of mRNA molecule.
   a) 5’ b) 3’
   c) Both 5’ and 3’ d) 2’

2) During translation peptide bond formation is by _____ enzyme.
   a) Aminoacyl tRNA synthetase b) DNA glycosylase
   c) Peptidyl disulphide isomerase d) Peptidyltransferase

3) In trp operon, tryptophan is act as
   a) Inhibitor b) Co-repressor
   c) Inducer d) Apo-repressor

4) Codon AUG codes for _____ amino acid in prokaryotes.
   a) Methionine b) Proline
   c) Formylated methionine d) Tryptophan

5) In protein folding _____ enzyme play important role.
   a) Aminoacyl tRNA synthetase b) DNA glycosylase
   c) Peptidyl disulphide isomerase d) Peptidyltransferase

6) In eukaryotes _____ is responsible for synthesis of rRNA.
   a) RNA polymerase α b) RNA polymerase II
   c) RNA polymerase III d) RNA polymerase I

7) In prokaryotic transcription process _____ is needed for intrinsic termination.
   a) Sigma factor b) Rho factor
   c) Pol - α d) Hairpin loop

P.T.O.

8) During mRNA processing poly 'A' tail formation is with the help of
   a) RNA polymerase I
   b) Ploy 'A' polymerase
   c) RNA polymerase III
   d) RNA polymerase II

9) Shine-Dalgarno sequences provide binding site for
   a) Activator
   b) Transcription factor
   c) Co-activator
   d) Ribosome

10) In lactose operon, β-Galactosidase encoded from
   a) Lac 'a' gene
   b) Lac 'd' gene
   c) Lac 'z' gene
   d) Lac 'y' gene

2. Answer the following **(any 5)** : **10**
   i) What is RNA polymerase ?
   ii) What is exon shuffling ?
   iii) What is amioacylation of tRNA ?
   iv) What is promoter sequences ?
   v) What are general transcription factors ?
   vi) Write a note on mRNA transport.

3. A) Answer the following (**any two)**: **6**
   i) Explain role of activators in regulation of eukaryotic transcription.
   ii) Describe structure of lactose operon.
   iii) Write a note on alternative splicing.

   B) Describe regulation of repressible operon in bacteria with suitable example. **4**

4. Answer **any two** of the following : **10**
   i) Describe regulation of translation in eukaryotes with suitable examples.
   ii) Describe protein folding and glycosylation of proteins.
   iii) Explain structure and function of tRNA molecule.

5. Answer **any two** of the following : **10**
   i) Describe role of signal transduction in regulation of transcription.
   ii) Describe process of protein synthesis in prokaryotes.
   iii) Describe mechanism of transcription in eukaryotes.

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SLR-J – 34

Seat No.	

B.Sc. (Part – II) (Semester – IV) (Biotechnology) (Old) Examination, 2016
TISSUE TECHNIQUES
Plant Tissue Culture

Time : 2 Hours Max. Marks : 50

N.B. *: 1) Figures to the **right** indicate **full** marks.*
*2) Draw a **neat**, well labelled, **complete** diagram **wherever** necessary.*
*3) **All** questions are **compulsory** and carry **same** marks.*

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

i) Embryos derived naturally by fertilization of male and female gametes are _____ embryos.
   a) Zygotic b) Non-zygotic
   c) Somatic d) None of the above

ii) Sterilization of nutrient media is carried out at following conditions of temperature and pressure
   a) 27° C, 1 atmosphere b) 37° C, 60%
   c) Room temperature, vacuum d) 121° C, 15 psi

iii) Nicotinic acid is a
   a) Amino acid b) Vitamin
   c) Sugar d) Growth hormone

iv) The ability of a single cell to grow into a whole plant is called
   a) Pluripotency b) Cell growth
   c) Totipotency d) Cell division

v) Explants are commonly surface-sterilized by using
   a) Formalin b) Sodium hypochlorite
   c) Nutrient medium d) Sterile water

vi) The part of a plant used for culturing is called
   a) Callus b) Cell suspension
   c) Stock d) Explant

P.T.O.

vii) Ethylene is employed for
a) Ripening of fruit b) Stimulation of cell division
c) Increased light d) Root growth

viii) _____ is most commonly used as solidifying agent in media.
a) Auxin b) Agar c) Sodium d) Ampicillin

ix) Culture of excised anthers to obtain haploid plants is known as _____ culture.
a) Anther b) Meristem c) Callus d) Protoplast

x) A tissue arising from disorganized proliferation of cells in cultures
a) Callus b) Shoot tip c) Wound d) Explant

2. Answer **any five** of the following : **10**
i) Enlist any 2 auxins used for preparation of PTC media.
ii) Mention any two sterilization methods.
iii) Define dedifferentiation.
iv) Differentiate between organ culture and organogenesis.
v) Define somatic embryogenesis.
vi) What is a protoplast ?

3. A) Answer **any two** of the following : **6**
i) Write importance of mineral constituents in Plant Tissue culture medium.
ii) Write a note on instruments required in plant tissue culture laboratory.
iii) Draw a well labelled, neat and complete diagram that explains the principle of callus culture and write the applications of callus culture.

B) Explain in brief – surface sterilization of explant and laboratory fumigation. **4**

4. Answer **any two** of the following : **10**
i) Give a detailed account on Plant Tissue Culture Laboratory Organization.
ii) Explain in detail – Somatic embryogenesis.
iii) Write a note on micropropagation.

5. Answer **any one** of the following : **10**
i) Write an essay on cell suspension culture.
ii) Explain in detail – protoplast isolation and fusion.

_____

SLR-J – 35

Seat No.	

B.Sc. (Biotechnology) (Semester – IV) Examination, 2016
TISSUE TECHNIQUES
Animal Tissue Culture (Old)

Time : 2 Hours Max. Marks : 50

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*
3) ***Draw*** *neat and labeled diagrams.*

1. Rewrite the following sentences by choosing correct alternatives. **10**

1) Most preferred method for sterilization of animal cell culture media is _____
   a) Filter sterilization b) Autoclaving
   c) Heat d) Steam

2) _____ uses hanging drop technique to culture frog nerve cell.
   a) Carrel b) Ross Harrison
   c) Butler d) Freshney

3) Which of the following method used for activation of plastic substrate ?
   a) UV Radiation b) Heat
   c) γ Radiation d) Visible light

4) _____ serum is routinely used in animal cell culture.
   a) Horse b) Amphibian c) Insect d) Bovine

5) Transfer of cell from primary culture to form secondary culture is known as _____
   a) Sub culturing b) Trypsinization
   c) Enzymatic disaggregation d) Mechanical disaggregation

6) In primary culture, cell divide to give different type of cells by _____ Process.
   a) Proliferation b) Differentiation
   c) Cultivation d) Initiation

7) _____ is a physical method used to get all the cells in same phase of growth in culture.
   a) TLC b) HPLC
   c) Cell size and sedimentation d) Electrophoresis

8) Normal cell divide a limited number of time and then die is a predetermined event known as _____
   a) Differentiation b) Proliferation
   c) Cell density d) Senescence

9) Hybridoma technique used for monoclonal antibodies discovered by _____
   a) Milstein b) Harrison c) Carrel d) Skoog

10) Isolation of lymphocyte from blood is carried out by using _____
   a) PBS b) Ficol Hypaque
   c) EMEM d) BSS

2. Answer the following **(any five)** : **10**

1) Define serum.
2) Write a note on CO_2 Incubator.
3) Explain in brief insect cell line.
4) Write a note on cell synchronization.
5) Explain in brief Karyotyping.
6) Write a note on packing of glasswares.

3. A) Answer the following **(any two)** : **6**

1) Write a note on Initiation of cell culture.
2) Write a note on cell repositories and their function.
3) Explain characteristics of animal cell in culture.

B) Describe sterilization practices in ATC. **4**

4. Answer the following **(any two)** : **10**

1) Describe in detail karyotyping.
2) Explain in detail natural media used in ATC.
3) Give details of apoptosis.

5. Answer the following **(any two)** : **10**

1) Discuss in detail complete culture media.
2) Describe any two technique of organ culture.
3) Explain milestones in animal cell culture.

_____

SLR-J – 36

Seat No.	

B.Sc. (Biotechnology) (Part – II) (Semester – IV) (Old) Examination, 2016
METABOLISM
Bioenergetics and Enzymology

Time : 2 Hours Max. Marks : 50

Instructions : *1)* ***All*** *questions are* ***compulsory***.
2) Figures to the ***right*** *side indicate* ***full*** *marks.*
3) Draw ***neat*** *labelled diagrams* ***wherever*** *necessary.*

1. Rewrite the sentence using correct alternative given below : **10**

1) The reaction's _____ ratio is the ratio of product concentrations to reactant concentrations at one given time which may be at equilibrium or not.
   a) free energy b) mass action
   c) enthalpy d) entropy

2) The more _____ is the reduction potential, greater is the species affinity for electrons and tendency to be reduced.
   a) negative b) positive
   c) equilibrium d) steady

3) In _____ type of reaction, the substituents are removed from the molecule.
   a) Isomerization b) Claisen condensation
   c) Elimination d) Aldol condensation

4) The _____ thermodynamic system does transfer energy but not the mass to its surroundings.
   a) Isolated b) Adiabatic
   c) Open d) Closed

5) The non-protein part covalently bound to the enzyme is the
   a) holoenzyme b) apoenzyme
   c) prosthetic group d) ribozyme

P.T.O.

6) According to _____ specificity of enzymes, an enzyme will act on a particular type of chemical bond regardless of the rest of the molecular structure.
   a) absolute b) group
   c) linkage d) stereochemical

7) In _____ inhibition of enzymes, the inhibitor binds to the site other than active site of an enzyme.
   a) competitive b) non-competitive
   c) uncompetitive d) irreversible

8) Ribozymes are the _____ molecule capable of catalyzing specific biochemical reactions.
   a) DNA b) RNA c) protein d) ribosome

9) Antibodies with the catalytic activity are called as
   a) abzymes b) ribozymes
   c) antizymes d) catazymes

10) The enzymes from the class of _____ catalyze nonhydrolytic addition of removal of functional groups from substrates.
   a) Oxidoreductases b) Transferases
   c) Hydrolases d) Lyases

2. Answer **any five** of the following : **10**

1) What is free energy concept of thermodynamics ?

2) Enlist different types of common biochemical reactions.

3) What is entropy ? State second law of thermodynamics.

4) What does the digits of EC number describe ?

5) State the significance of Vmax.

6) Define unit of an enzyme activity.

7) State the relation between standard redox potential and free energy change.

8) State the relation between equilibrium constant and standard free energy change.

3. A) Answer **any two** of the following : **6**
   1) Define redox potential. How it is measured ?
   2) Explain the lock and key model of enzyme catalysis.
   3) State the features of active site of an enzyme.

   B) Derive the Michaelis Menten equation of enzyme kinetics. **4**

4. Answer **any two** of the following : **10**
   1) Explain ATP molecule as universal currency of free energy in biological system.
   2) Write an account on isoenzymes of LDH and their clinical importance.
   3) Write a note on non-protein enzymes.

5. Answer **any two** of the following : **10**
   1) Illustrate the regulation of enzymes in living system.
   2) Describe types of enzyme inhibition and their kinetics.
   3) Write an account on factors affecting enzyme activity.

SLR-J – 37

Seat No.	

B.Sc. II (Semester – IV) (Old) Examination, 2016
BIOTECHNOLOGY
Metabolism

Time : 2 Hours Max. Marks : 50

Instructions : *1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*
3) Draw ***neat*** *and labeled diagram.*

1. Rewrite the following sentence by using correct alternative. **10**

1) Pentose phosphate pathway provides

a) Pentose sugar b) NADPH

c) Both a and b d) None of these

2) _____ antibiotic completely blocks ATP synthesis by blocking the flow of protons through F_0 of ATP synthase.

a) Oligomycin b) Rotenone

c) Antimycin A d) All of these

3) Chemiosmotic hypothesis was proposed by

a) John Robert b) Robert Brown

c) Peter Mitchell d) Robert Hook

4) For the formation of one molecule of palmitate how many ATP and NADPH are required.

a) 7 ATP and 7 NADPH b) 7 ATP and 17 NADPH

c) 17 ATP and 7 NADPH d) 7 ATP and 14 NADPH

P.T.O.

5) Conversion of glucose 6 phosphate to glucose 1 phosphate is carried out by

a) Hexokinase b) Triose phosphate isomerase

c) Phosphoglucomutase d) Isomerase

6) Photorespiration takes place in

a) Chloroplast b) Prioxisome

c) Mitochondria d) All of these

7) The reaction centre of PS I is designated as

a) P 700 b) P 680 c) P 860 d) P 862

8) In human beings _____ is the final product of purine degradation and is excreted in the urine.

a) Uric acid b) Ammonium sulphate

c) Citrate d) None of these

9) Living organisms excrete the excess of nitrogen resulting from the metabolic breakdown of amino acids in which of the following way

a) Ammonotelic b) Ureotelic

c) Uricotelic d) All of these

10) Glucagon is a polypeptide hormone secreted by the _____ cells of pancreatic islets.

a) alpha b) beta c) gamma d) delta

2. Answer **any five** of the following. **10**

1) What is ethanol fermentation ?

2) Write down regulation TCA cycle.

3) How ATP and ADP are exchanged across mitochondrial membrane ?

4) Define photosystem and give its type.

5) What are the fates of pyruvate ?

6) What are ketone bodies ?

7) What is Q cycle ?

3. A) Answer **any two** of the following. **6**

   1) Explain cyclic photophosphorylation.

   2) Explain glycogen breakdown in liver.

   3) Note on inhibiters of electron transport chain and ATP synthase.

   B) Explain de novo synthesis of pyrimidine nucleotide. **4**

4. Answer **any two** of the following. **10**

   1) Explain the metabolism of cholesterol.

   2) Define glycolysis and give its pathway.

   3) Explain the C3 pathway of CO_2 fixiation.

5. Answer **any two** of the following. **10**

   1) Explain the mechanisms of ATP formation through oxidative phosphorylation.

   2) Give note of biosynthesis of amino acids.

   3) Explain the pentose phosphate pathway.

SLR-J – 38

Seat No.	

B.Sc. III (Semester – V) (Biotechnology) Examination, 2016
ENGLISH (Compulsory) (New) (CGPA)
Breakthrough

Time : 2 Hours 30 Minutes Max. Marks : 70

N.B. : *1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicate **full** marks.*

1. A) Choose the correct alternative : **10**

1) Which of the following statements, according to G.B. Shaw, is not true about the poor ?
   a) The poor are kept poor by their ignorance
   b) The squire is the ally of the poor
   c) Political economy is an obstacle in raising the wages of the poor
   d) The poor who receive a complete education are taught so many flat lies

2) The average parson teaches _____ at the village school.
   a) honesty and equality b) loyalty and religion
   c) deference to the rich d) religion and law

3) The great civil war that was fought between the Northern States and the Southern States of America came to an end in
   a) July 1863 b) November 1863
   c) August 1863 d) October 1863

4) Abraham Lincoln was assassinated in
   a) 1863 b) 1864 c) 1856 d) 1865

5) At the end of his address, Abraham Lincoln says that _____ shall not perish from the earth.
   a) Monarchy b) Dictatorship c) Democracy d) Aristocracy

6) According to Virginia Woolf, the woman who was born with a gift of poetry in the 16^{th} century was an _____ woman.
   a) unlucky b) unhappy c) unfortunate d) honourable

P.T.O.

7) Which of the following statements about women is not true ?
   a) Women of genius have to bear hostility of men
   b) Importance given to chastity prevented women living a free life like male writers
   c) In the past a woman had to depend on goodwill of her father for pin money
   d) In the 16th century, woman were encouraged to write poetry

8) _____ had made Abou Ben Adhembold.
   a) Courage b) Knowledge
   c) Exceeding peace d) Worship of god

9) The ship in the poem "O Captain! My Captain!!" is a metaphor for
   a) The World b) The United States of America
   c) The Northern States of America d) The Southern States of America

10) The flower mentioned in the poem "Abou Ben Adhem" is a
   a) lotus b) rose c) hyacinth d) lily

B) Rewrite the following sentences choosing the correct modal auxiliary from the brackets : **2**

1) It's a hospital. You _____ not smoke. (would, might, may, must)

2) _____ you stand on your head for more than a minute ? (May, Can, Must, Shall)

C) Write the following sentences in indirect speech : **2**

1) Sudha said to me, "I don't believe you".

2) The doctor said to the patient, "Quit smoking".

2. Answer **any seven** of the following questions in brief : **14**

1) How, according to G.B. Shaw, do the respectful peasants behave in revolutions ?
2) What does G.B. Shaw say about the Press ?
3) What is the central idea of the prose "Church, School and Press" ?
4) Why was the great American civil war fought ?
5) What advice does Abraham Lincoln give to American people in his Gettysburg address ?
6) On what occasion did Abraham Lincoln deliver the Gettysburg address ?
7) Why were there so few women writers in the 16th Century ?
8) What does the title "A Room of One's Own" suggest ?
9) What did women writers do to hide their identity ?

3. A) Answer **any two** of the following questions in brief : **8**

   1) What are the poetic devices that Hunt has used in the poem *Abou Ben Adhem* ?

   2) What is the message of the poem *Abou Ben Adhem* ?

   3) What is the theme of the poem *O Captain! My Captain!!* ?

   B) Write short reports on **any two** of the following : **6**

   1) India's performance in Rio Olympics.

   2) The Prize Distribution Ceremony of your college.

   3) Your visit to Sanjay Gandhi National Park.

4. Answer **any one** of the following : **14**

   1) Prepare a presentation consisting of five charts or slides to promote an *Electronic Body Massager* in the market.

   2) Write a presentation on the topic "Mobile Mania in India" using charts, transparencies or slides.

5. Write a transcript of group discussion on the topic "Privatization of higher education". **14**

SLR-J – 39

Seat No.	

B.Sc. – III (Semester – V) (Biotechnology) Examination, 2016
PLANT DEVELOPMENT (New CGPA)

Max. Marks : 70

Time : 2 Hours 30 Minutes

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Draw **neat** labeled diagram **wherever** necessary.*
*3) Figures to the **right** indicate **full** marks.*

1. Choose the most correct alternative for the following and rewrite the sentences. **14**

1) Which of the following layer of anther wall has a great physiological significance in the development of pollen grain ?

a) Epidermis b) Endothecium c) Middle layer d) Tapetum

2) _____ is a condition in which the stigma matures first and loses its receptivity by the time the anthers shed their pollens.

a) Protogyny b) Protoandry c) Herkogamy d) Heterostyly

3) The flowers which open normally are called

a) Cleistogamous flower b) Deistogamous flower
c) Chasmogamous flower d) All of these

4) _____ is the albuminous seed.

a) Gram b) Pea c) Bean d) Castor

5) Polyembryony was first time found by

a) A very b) Arber
c) Antony Van Leewenhoek d) Nawaschin

6) The embryo evolved in culture medium are known as

a) Adventitious embryos b) Somatic embryo
c) Embryoids d) All of these

7) Arabidopsis thaliana is a member of _____ family.
   a) Brassicaceae b) Arabidopsis c) Asteraceae d) Bignoniaceae

8) Genome size of Arabidopsis thaliana is
   a) 135 bp b) 3 Mbp c) 140 bp d) 135 Mbp

9) Pectin which is present in plant cell wall is
   a) Protein b) Lipid c) Carbohydrate d) None of these

10) Indole-3-Acetic Acid (IAA) is derived from
   a) Glycine b) Tryptophan c) Histidine d) Aspartic acid

11) TAIR stands for
   a) The Arabidopsis India Resource
   b) The Arabidopsis Information Resource
   c) The Arabidopsis Indian Region
   d) The Arabidopsis International Resource

12) In cellulose the glucose molecules are linked to each other by
   a) β 1-6 linkage b) α 1-4 linkage
   c) β 1-4 linkage d) α 1-6 linkage

13) _____ is used as rooting hormone to successfully develop new plants from cuttings.
   a) NAA b) GA c) ABA d) Ethylene

14) _____ is a product of metabolism of the amino acid methionine and is produced in greater amounts in senescing tissues than in young or mature tissues.
   a) Auxin b) Cytokinins c) Ethylene d) Gibberellins

2. Attempt **any seven** of the following. **14**

1) Define pollination and give its types.
2) What is meant by pollen embryo ?
3) What are the difference between monocot and dicot plants ?
4) Define apomixis and give its types.

5) Why arabidopsis thaliana is used as model plant ?

6) What are the practical application of ethylene ?

7) What are the functions of stomata ?

8) What is plant patterning ?

9) What is cytoskeleton ?

3. A) Attempt **any two** of the following. **10**

1) Pollen-Pistil interaction.

2) Cell wall development in plants.

3) What are the different mode of entry of pollen tube into ovule ?

B) Describe biochemistry of fruit maturation. **4**

4. Attempt **any two** of the following. **14**

1) Development of male gametophyte.

2) Explain the development of embryo development in monocot plant.

3) Give general account on auxin with its practical application.

5. Attempt **any two** of the following. **14**

1) Describe self-incompatibility.

2) Describe the endosperm formation with its type.

3) Explain the leaf development in plants.

SLR-J – 40

Seat No.	

B.Sc. – III (Biotechnology) (Sem. – V) Examination, 2016
ANIMAL DEVELOPMENT (New – CGPA)

Time : 2 ½ Hours Total Marks : 70

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Draw **neat** and labeled diagrams **wherever** necessary.*
*3) Figures to **right** indicates **full** marks.*

1. Rewrite the following sentences by using correct alternative : **14**

1) Budding is commonly observed in _____
   a) Cnidarians b) Annelids c) Sponges d) All of these

2) The branch of study dealing with old age and aging is called as _____
   a) Oncology b) Gerontology c) Herpetology d) Teratology

3) The hormone causing moulting in arthropods is _____
   a) Prolactin b) Ecdysone c) TSH d) Somatotrophin

4) *Rb* gene is an example of _____
   a) Oncogene b) Proto-oncogene
   c) Anti-oncogene d) None of these

5) According to _____ theory the embryo develops by progressive growth and differentiation.
   a) Germplasm b) Biogenetic c) Mosaic d) Epigenesis

6) _____ used as precursor for synthesis of yolk.
   a) Vitellogenin b) Fibers c) Platelets d) ECM

7) _____ cells are known as interstitial cells.
   a) Sertoli b) Leydig c) Sperm d) Spermatogonial

8) Sperm acrosome contains _____
   a) Sperm lysin b) Acrosin c) Hyaluronidase d) All of these

9) Frog egg cleaves through _____ type of cleavage.
   a) Superficial meroblastic b) Radial holoblastic
   c) Discoidal meroblastic d) Spiral holoblastic

10) Insect egg is an example of _____ egg.
   a) Centrolecithal b) Telolecithal
   c) Mesolecithal d) Microlecithal

11) According to Gilchrist (1968), the prospective _____ is called "Zone of expansion".
   a) Ectodermal zone b) Endodermal zone
   c) Mesodermal zone d) None of these

12) In honeybees _____ produced parthenogenetically.
   a) Queen b) Worker c) Drone d) All of these

13) Cancer develops from connective tissue is called as _____
   a) Sarcoma b) Carcinoma
   c) Adenoma d) Lymphoma

14) _____ first to distinguished germplasm as a separate entity from somatoplasm.
   a) Weismann b) Roux c) E. Haeckel d) Child

2. Answer the following **(any 7)** : **14**

i) Write a note on Mosaic theory.

ii) Explain free radical theory of aging.

iii) How fertilization membrane is formed ?

iv) Write a note on significance of oogenesis.

v) Write a note on Graffian follicle.

vi) Write a note on chemical changes during cleavage.

vii) What is epiboly and emboly ?

viii) Write a note on properties of stem cells.

ix) Write a note on Regeneration in microbes.

3. A) Answer **any two** of the following : **10**
   i) Describe blastulation in centrolecithal eggs with suitable example.
   ii) Describe mechanism regeneration in invertebrates with suitable example.
   iii) Describe fate map of frog blastula.

   B) Describe structure of typical sperm with neat labeled diagram. **4**

4. Answer **any two** of the following : **14**
   i) Explain different types of cleavage with suitable examples.
   ii) Describe various theories of aging.
   iii) Explain embryonic adaptations in Amphioxus and frog.

5. Answer **any two** of the following : **14**
   i) Describe process of spermatogenesis with neat labeled diagram.
   ii) Describe blastulation and gastrulation in frog.
   iii) Describe process of metamorphosis with any suitable example.

SLR-J – 41

Seat No.	

B.Sc. (Biotechnology) (Part – III) (Semester – V) (New CGPA) Examination, 2016
BIOINFORMATICS AND NANOTECHNOLOGY

Time : $2^{1}/_{2}$ Hours Total Marks : 70

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicate **full** marks.*

1. Rewrite the sentence using correct alternative given below : **14**

1) The structural database of nucleic acid is _____

a) PDB b) NRL – 3D c) GenBank d) NDB

2) BLAST is used for _____ alignment.

a) Global b) Local c) Multiple d) Global and local

3) Sanger Centre, HGMP-RC, EBI is hosted by _____

a) Hinxton Hall b) MIPS c) UCL d) NCBI

4) The protein sequence database is _____

a) GenBank b) EMBL c) DDBJ d) SWISS-PROT

5) The PubMed provides information of _____ database.

a) Nucleotide b) Protein c) Genome d) Literature

6) OWL is _____ database.

a) Redundant b) Unverified c) Unannotated d) Composite

7) One nanometer is the _____ part of a meter.

a) Thousandth b) Millionth c) Billionth d) Trillionth

8) _____ is a tool to imagine nanoscale behaviors.

a) NanoCAD b) NanoRAM c) NanoROM d) NanoUSB

P.T.O.

9) High energy ball milling is a _____ method of nanoparticle synthesis.
   a) Physical b) Chemical
   c) Biological d) Natural

10) In _____ approach, the atoms and molecules are removed from a bulk material or sometimes thin films so as to obtain desired nanostructure.
   a) Top down b) Bottom up
   c) Traditional d) Modern

11) The study of complete genome of organism is known as _____
   a) Proteomics b) Metagenomics
   c) Genomics d) Pharmacology

12) The size of the nanoparticles ranges from _____
   a) 1 to 10 nm b) 100 to 200 nm
   c) 10 to 100 nm d) 150 to 200 nm

13) Increasing the stability of nanoparticles by coating them with other molecules is known as the _____ of nanoparticles.
   a) Tagging b) Capping
   c) Layering d) Probing

14) Melt mixing is a _____ method of nanomaterial synthesis.
   a) Vapor based b) Biological
   c) Deposition d) Mechanical

2. Answer **any seven** of the following : **14**

1) What is TrEMBL ?
2) What is MMDB ?
3) What is phylogeny ?
4) What are different sizes of matter ? How much is a nano size ?
5) What is the difference between top down and bottom approach of nanomaterial synthesis ?

6) What is self assembly of nanoparticles ?

7) Which techniques are used for measurement of nanomaterials ?

8) Write a note on BLOSUM matrices.

9) Enlist different types of lithography.

3. A) Answer **any two** of the following : **10**

1) What is FASTA ? Write its methodologies in alignment ?

2) Write about polymerization of nanomaterials.

3) What is NanoCAD ? How it is used as a tool to analyze nanoscale behavior ?

B) Explain in detail PRINTS and BLOCKS. **4**

4. Answer **any two** of the following : **14**

1) What is alignment ? Enlist the different tools used for alignment.

2) Describe applications of Nanotechnology.

3) Add a note on 'nano sized biosystems'. Give an example.

5. Answer **any two** of the following : **14**

1) Give applications of Bioinformatics in different field.

2) Illustrate different methods of nanomaterial synthesis.

3) What is sequence alignment ? Explain multiple sequence alignment using Clustal X.

SLR-J – 42

Seat No.	

B.Sc. (Part – III) (Semester – V) (New CGPA) Examination, 2016
BIOTECHNOLOGY
Recent Trends in Biotechnology

Time : 2½ Hours Max. Marks : 70

***Instructions** : 1) **All** questions are **compulsory**.*
*2) **All** questions carry **equal** marks.*
*3) Draw **neat** and labelled diagrams **wherever** necessary.*

1. Rewrite the sentences selecting most correct answer from the given option : **14**

1) The PCR technique was developed by
   a) Kary mulis b) Kohler c) Milstein d) Atman

2) Ex-situ bioremediation involves
   a) Degradation of pollutants by microbes
   b) Removal of pollutants and collection at another place to facilitate microbial degradation
   c) Degradation of pollutants by genetically engineered microbes
   d) None of these

3) The immobilized technique involving chemical method is
   a) Covalent bond formation dependant
   b) Non-covalent bond formation dependant
   c) Both a) and b)
   d) Ionic bond formation dependant

4) Phytoremediation is carried out with the help of
   a) Echornia b) Rhizobium c) Arabidopsis d) Casuarina

5) The transport of medium for toxicants is usually
   a) Air b) Water c) Food d) All of these

6) PCR is used in
   a) Site Specific Recombination b) Site Directed Mutagenesis
   c) Site Specific Translocation d) None of the above

7) Cloning will be subjected to most serious moral questions if applied to
   a) Reptiles b) Humans c) Birds d) Mammals

8) For glucose isomerization by immobilized enzyme, the reactor generally used is
   a) CSTR b) Plug flow
   c) Packed bed d) Fluidized bed

9) The process of extraction of metals from ore bearing rocks is called
   a) Bioextraction b) Microbial extraction
   c) Biofiltration d) Bioleching

10) Bioethics is concerned with
   a) Healthcare law
   b) Etiquette in medical facilities
   c) The ethical implication of biological research methods and results
   d) None of the above

11) The process in which compound are modified into metabolites that are more toxic than the parent compound is
   a) Biotransformation b) Detoxication
   c) Toxication d) All of above

12) The commonly employed water insoluble support for the covalent attachment of enzyme includes
   a) Acrylamide based polymers b) Polypeptides
   c) Dextrans d) All of these

13) In _____ the draft sequences of the Human Genome completed.
   a) 1988 b) 1990 c) 2003 d) 2005

14) Stirred tank bioreactor have been designed for
   a) Purification of the product
   b) Addition of preservatives to the product
   c) Availability of O_2 throughout the process
   d) Ensuring anaerobic conditions in the culture vessel

2. Answer **any seven** of the following : **14**

1) State the factors affecting toxicity.

2) Define bioremediation and give its types.

3) Give the application of metabolic engineering.

4) Write a note on Human Cloning.

5) Give the difference between LD_{50} and LC_{50}.

6) Give the short note on Bioaugmentation.

7) Give the industrial applications of enzyme engineering.

8) Explain cell immobilization.

9) Add a note on NOEL.

3. A) Answer **any two** of the following : **10**

1) Explain biotreatment mechanisms of industrial waste water.

2) Explain in detail enzyme immobilization with its types.

3) Explain site directed mutagenesis.

B) Define phytoremediation. Explain various uses of phytoremediation. **4**

4. Answer **any two** of the following : **14**

1) Define Ecotoxicology. Give the types of xenobiotic compounds and their effects on environment and human beings.

2) What is bioethics ? Give the ethical issues of stem cell research.

3) Applications of immobilized enzymes.

5. Answer **any two** of the following : **14**

1) Define Bioremediation. Give phytoremediation technologies for soil decontamination.

2) Give an detail account on ethical issues of xenotransplantation.

3) Explain the mechanism of organ detoxification in human body.

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SLR-J – 44

Seat No.	

B.Sc. – III (Semester – V) (Old) Examination, 2016
BIOTECHNOLOGY
Plant Development

Time : 2 Hours Max. Marks : 50

1. Multiple choice question : **10**

1) Microspore mother cell is _____
   a) Haploid b) Diploid c) Triploid d) Tetraploid

2) If pollination takes places on the surface of water is known as _____
   a) Hypohydrophily b) Epihydrophily
   c) Entomophily d) Anemophily

3) If pollen grain produces single pollen tube is known as_____
   a) Polysiphonous b) Monosiphonous
   c) Monogamy d) Polygamy

4) The endosperm in Oenothera is _____
   a) Haploid b) Diploid c) Triploid d) Polyploid

5) The development of diploid embryo sacs from the cells of the nucellus or integument is called _____
   a) Generative apospory b) Somatic apospory
   c) Apogamy d) Syngamy

6) Arabidopsis thaliana was first discovered by _____
   a) Johannes Thal b) Thomas Mitchell
   c) Warwick S. T. d) Francis A

7) TAIR stands for _____
   a) The Arabidopsis India Resource
   b) The Arabidopsis Information Resource
   c) The Arabidopsis Indian Region
   d) The Arabidopsis International Resource

8) In cellulose the glucose molecules are linked to each other by _____

a) β 1 – 6 linkage b) α 1 – 4 linkage

c) β 1 – 4 linkage d) α 1 – 6 linkage

9) _____ is used as rooting hormone to successfully develop new plants from cuttings.

a) NAA b) GA c) ABA d) Ethylene

10) _____ is a product of metabolism of the amino acid methionine and is produced in greater amounts in senescing tissues than in young or mature tissues.

a) Auxin b) Cytokinins c) Ethylene d) Gibberellins

2. Answer **any five** of the following : **10**

1) What is mean by sperm dimorphism ?
2) Which are the adaptation taking place in anemophilous flowers ?
3) Define the term albuminous and exalbuminous with example.
4) Cleavage polyembryony.
5) Short note Arabidopsis thaliana.
6) What is meant by vernalization ?
7) What are the role of cytokinine ?

3. A) Answer **any two** of the following : **6**

1) Explain different types of embryos sacs.
2) Note on vernalization.
3) Define apomixis and give its significance.

B) Self – incompatibility. **4**

4. Answer **any two** of the following : **10**

1) Explain the development of female gametophyte.
2) Explain the development of dicot embryo.
3) Explain in brief phytohormones.

5. Answer **any two** of the following : **10**

1) Give detail account on development of periderm in plant.
2) Shoot patterning.
3) What are the pollination agents and explain biotic and abiotic agents.

SLR-J – 45

Seat No.	

B.Sc. – III (Semester – V) (Old) Examination, 2016
BIOTECHNOLOGY
(Animal Development)

Time : 2 Hours Max. Marks : 50

Instructions *: 1)* ***All*** *questions carry* ***equal*** *marks.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*
3) ***Draw*** *neat and* ***labelled*** *diagrams.*

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

1) Development of an egg without fertilization is called _____
   a) Sexual reproduction b) Parthenogenesis
   c) Agamogenesis d) Gametogenesis

2) Insect egg is _____
   a) Alecithal b) Centrolecithal
   c) Microlecithal d) Telolecithal

3) Germplasm theory was proposed by _____
   a) Weismann b) Driesh c) Spemann d) Roux

4) Organizers theory was proposed by _____
   a) Weismann b) Driesh c) Spemann d) Roux

5) In spermatogenesis _____ number of sperm was formed from 10 spermatogonial cells.
   a) 10 b) 20 c) 30 d) 40

6) Frog egg cleaves through _____ type of cleavage.
   a) Equal holoblastic b) Unequal holoblastic
   c) Equal meroblastic d) Unequal meroblastic

7) _____ is local in folding of tissue layer and formation of depression or pocket like structure.
   a) Invagination b) Involution c) Epiboly d) Emboly

8) In _____ blastopore opening is going to develop into mouth.
   a) Deuterostome b) Protostome c) Mesostome d) Heterostome

9) Synthesis of yolk is known as _____
   a) Protein synthesis b) Previtellogenesis
   c) Vitellogenesis d) All of these

10) _____ is not an example of asexual reproduction.
   a) Budding b) Fission
   c) Gemmule formation d) Conjugation

2. Answer the following **(any 5)** : **10**
   i) Preformation theory
   ii) Spermiogenesis
   iii) Regulation of ovulation
   iv) Planes of cleavage
   v) Morulation
   vi) Metamorphosis.

3. A) Answer the following (**any 2**) : **6**
   i) Write a note on oogenesis in mammals.
   ii) Describe post-fertilization changes in egg cytoplasm.
   iii) Write a note on aging.

   B) Describe blastulation in centrolecithal egg. **4**

4. Answer **any two** of the following : **10**
   i) Explain in detail Baer's and Biogenetic law.
   ii) Describe the structure of typical spermatozoa.
   iii) Define cleavage and explain patterns of cleavage.

5. Answer **any two** of the following : **10**
   i) Give general process of gastrulation
   ii) Write note on mechanism of fertilization.
   iii) Describe embryonic adaptations in amphioxus and frog.

_____

SLR-J – 46

Seat No.	

B.Sc. (Part – III) (Semester – V) Examination, 2016
BIOTECHNOLOGY
Bioinformatics and Nanotechnology (Old)

Time : 2 Hours Total Marks : 50

Instructions : *1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *side indicates* ***full*** *marks.*

1. Rewrite the sentence using correct alternative given below : **10**

1) The structural database of nucleic acid is
   a) PDB b) NRL-3D c) GenBank d) NDB

2) BLAST is used for _____ alignment.
   a) Global b) Local
   c) Multiple d) Global and local

3) Sanger Centre, HGMP – RC, EBI is hosted by
   a) Hinxton Hall b) MIPS c) UCL d) NCBI

4) The protein sequence database is
   a) GenBank b) EMBL
   c) DDBJ d) SWISS-PROT

5) The PubMed provides information of _____ database.
   a) Nucleotide b) Protein c) Genome d) Literature

6) OWL is _____ database.
   a) Redundant b) Unverified
   c) Unannotated d) Composite

7) One nanometer is the _____ part of a meter.
   a) thousandth b) millionth c) billionth d) trillionth

8) _____ is a tool to imagine nanoscale behaviors.
   a) NanoCAD b) NanoRAM c) NanoROM d) NanoUSB

9) High energy ball milling is a _____ method of nanoparticle synthesis.

a) physical b) chemical c) biological d) natural

10) In _____ approach, the atoms and molecules are removed from a bulk material or sometimes thin films so as to obtain desired nanostructure.

a) top down b) bottom up c) traditional d) modern

2. Answer **any five** of the following : **10**

1) What is TrEMBL ?

2) What is MMDB ?

3) What is phylogeny ?

4) What are different sizes of matter ? How much is a nano size ?

5) What is the difference between top down and bottom approach of nanomaterial synthesis ?

6) What is self assembly of nanoparticles ?

7) Which techniques are used for measurement of nanomaterials ?

3. A) Answer **any two** of the following : **6**

1) What is GenBank ? Write its applications.

2) Write about nanomaterials.

3) What is SEM ? How it is used as for measuring nanostructures ?

B) Explain in detail PRINTS and BLOCKS. **4**

4. Answer **any two** of the following : **10**

1) What is alignment ? Explain Local and Global alignment.

2) Write about the physical methods of nanomaterial synthesis.

3) Add a note on polymerization of nanomaterial. Give an example.

5. Answer **any two** of the following : **10**

1) Write a note on MMDB databases.

2) What are the applications of nanomaterial in drug delivery ?

3) Write a note on Composite Protein sequence databases.

_____

SLR-J – 47

Seat No.	

B.Sc. III (Semester – V) (Old) Examination, 2016
BIOTECHNOLOGY
Recent Trends in Biotechnology

Time : 2 Hours Max. Marks : 50

***Instructions** : 1) **All** questions carry **equal** marks.*
*2) Figures to the **right** indicate **full** marks.*
*3) Draw **neat** and labeled diagrams wherever **necessary**.*

1. Write following sentences selecting most correct answer from the given options. **10**

1) Bioremediation means
   a) Use of living microorganism to degrade environmental pollutants
   b) Use of chemical agents to degrade environmental pollutants
   c) Thermophilic remediation
   d) Use of non-living materials to degrade pollutants

2) _____ means use of plants to remediate the soil contaminants.
   a) Liquification b) Phytoremediation
   c) Pyrolysis d) Bioaugmentation

3) The transport medium for toxicants is usually
   a) Air b) Water c) Food d) All of these

4) The most commonly employes cross linked polymer is the
   a) Polyacrylamide b) Collegen
   c) Cellulose d) Cation exchange resin

5) Biodegradation of pesticides in soil is strongly affected by
   a) Pestiside concentration b) Types of crops
   c) Soil moisture d) Application method used

6) The discipline dealing with the ethical implications of biological research is known as

a) ethics b) etiquette c) law d) bioethics

7) Laws applying specifically to the practice of medicine in a certain state are called

a) acts of protocol b) medical practice acts

c) civil licensing acts d) state medical guidelines

8) Site-directed mutagenesis is a molecular biology technique in which a mutation is created at a defined site in a _____ molecule.

a) RNA b) DNA c) Genetics d) Protein

9) True about PCR

a) Primers required

b) DNA depend RNA polymerase required

c) RNA depend DNA polymerase required

d) All of the above

10) The human genome project was completed on

a) 15th April 2003 b) 14th April 2003

c) 14th April 2004 d) 13th April 2004

2. Answer **any five** of the following. **10**

i) What is bioethics ? Add a note on ethics of resource management.

ii) Define the term LD50.

iii) What is in-situ and ex-situ remediation of soil ?

iv) Explain bioaugmentation.

v) Enzyme engineering.

vi) Bioethics of biodiversity.

3. A) Answer **any two** of the following. **6**

   i) Explain the role of organs in detoxification mechanism.

   ii) Explain in detail bioethics of human genome project.

   iii) Limitations of immobilization.

   B) What is phytoremediation ? Describe various plant species involved in phytoremediation. **4**

4. Answer **any two** of the following. **10**

   i) Explain biochemical and ecological foundations of bioremediation and add a note on ex-situ decontamination of groundwater.

   ii) Give an account of different methods used for analysis of metabolic network.

   iii) Define bioethics. Give the ethical issues of human cloning.

5. Answer **any two** of the following. **10**

   i) Write the basic principles of metabolic engineering.

   ii) What are the principles of toxicology ? Describe types of toxic substances.

   iii) Discuss about the ethical issue of xenotransplantation.

SLR-J – 48

Seat No.	

B.Sc. – III (Semester – VI) (Biotechnology) Examination, 2016
ENGLISH (Compulsory)
Breakthrough (New)

Time : 2 Hours Max. Marks : 50

Note : *1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*

1. Choose the correct alternative : **10**

1) Tom appeared on the _____ with a bucket of whitewash and a long-handled brush.

a) Sidewalk b) Road c) Land d) Path

2) Loisel is a little clerk in the Department of

a) Revenue b) Education

c) Military d) Army

3) Mathilde discovered, in a box of black stain, a superb _____ of diamonds.

a) Bracelet b) Ring c) Necklace d) Pedal

4) Pyramus saw the footsteps of the _____ , and the colour fled from his cheeks at the sight.

a) Leopard b) Tiger c) Monster d) Lion

5) 'In the Bazaars of Hyderabad' is a popular _____ by Naidu.

a) Sonnet b) Lyric c) Ballad d) Ode

6) The speaker asks Virtue to attend to her in her _____ years.

a) Old b) Youthful

c) Joyful d) Childhood

7) The tag question for the sentence "Maria seldom writes letters" is

a) doesn't she ? b) does she ?

c) is she ? d) isn't she ?

8) The sentence "In spite of searching everywhere for the key, we could not find it" is a

a) Complex sentence b) Compound sentence

c) Simple sentence d) None of these

9) "He still loves the house where he spent his childhood." The underlined clause is

a) An adjectival clause b) An adverbial clause

c) A noun clause d) A relative clause

10) The sentence "Let's get a set of new curtains for the house" is

a) A declarative sentence b) An imperative sentence

c) An interrogative sentence d) An exclamatory sentence

2. Answer **any five** of the following questions in **two** to **three** sentences **each**. **10**

1) How did Tom eventually avoid the work of whitewashing the fence ?

2) Describe the daydreams of Mathilde.

3) What takes place after the party that changes Mathilde's state of mind ?

4) What is the end of the story Pyramus and Thisbe ?

5) Where did Pyramus and Thisbe decide to meet ?

6) How did Tom try persuade Jim to help with his task ?

3. A) Answer **any two** of the following questions in **three** to **four** sentences **each**. **6**

1) What are the merchants selling in the bazaars of Hyderabad ?

2) What is the theme of the poem 'On Virtue' ?

3) Who will buy the things the goldsmiths make ?

B) Answer **any two** of the following questions. **4**

1) What do you do if you find yourself under stress ?

2) How you will adapt yourself when you are in difficult situation ?

3) What do you do to manage your time if your workload increases ?

4. Answer **any one** of the following questions. **10**

1) Write a description of a young beautiful bride.

2) Describe in detail your trip to South India.

5. Read the passage below and summarise it. **10**

Millions of people today travel by air across time zones and suffer jet lag in the process. The world has become one big market, and business people have to be constantly travelling; this robs them of their sleep. Even at other times, these men and women have to stay awake keeping track of market developments in the business capitals of the world, such as New York, London and Tokyo. If they fail to monitor the movements of prices in the foreign markets, they will be losers.

Radio and television must bear their share of responsibility for depriving people of sleep. Even after local transmissions have closed by midnight, satellite transmission brings programmes from other transmitting stations across the world throughout the night. Many people get addicted to television and consider themselves compensated for the loss of sleep by being able to watch interesting programmes of entertainment or live telecasts of sports or political events from foreign countries.

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SLR-J – 49

Seat No.	

B.Sc. – III (Semester – VI) (New) Examination, 2016
BIOTECHNOLOGY
Genetic Engineering : Tools and Techniques – I

Time : 2 Hours Max. Marks : 50

N.B. : *1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*

1. Rewrite the following sentences by using the correct answers from given alternatives : **10**

1) _____ restriction endonucleases are most commonly used in recombinant DNA technology.
a) Type – I b) Type – II c) Type – III d) Type – IV

2) _____ vector contains genes for replication and maintenance of F factor, a selectable marker and cloning regions.
a) Plasmid b) Cosmid c) BAC d) YAC

3) Maximum insert size of a cosmid vector is in the range of
a) 40-45 Kb b) 25-30 Kb c) 400-450 Kb d) 6-12 Kb

4) Maxam Gilbert method is used for sequencing of
a) RNA b) DNA c) Protein d) Other biomolecules

5) C-DNA library is prepared from
a) r-RNA b) t-RNA c) m-RNA d) Sn-RNA

6) In genetic engineering a probe is used for
a) Cloning b) Screening c) Cleaving d) Recombinant DNA

7) _____ is used in all blotting techniques.
a) Cellulose b) Cellulose acetate
c) Carboxymethyl cellulose d) Nitrocellulose

8) DNA fingerprinting is based on the technique of _____ sequences.
a) Minisatellite b) Promoter c) Enhancer d) Operator

P.T.O.

9) _____ is the thermostable enzyme used in PCR.
   a) DNA Polymerase
   b) Taq DNA polymerase
   c) Maq DNA polymerase
   d) DNA Ligase

10) The technique of using electric current to allow entry of DNA into a cell is called
   a) Electrophoresis
   b) Electroporation
   c) Microinjection
   d) Macroinjection

2. Answer **any five** of the following : **10**
   i) Discuss the role of APS and TEMED.
   ii) PEG mediated gene transfer technique.
   iii) Write a note on basic properties of a vector.
   iv) Explain primer walking.
   v) Describe transformation.
   vi) Explain Dot Blot technique.

3. A) Answer **any two** of the following : **6**
   i) Explain the technique of electrophoresis and add a note on their applications.
   ii) Explain all the properties of best vector.
   iii) Discuss the technique of indirect transformation.

   B) Write a note on genomic DNA probes. **4**

4. Answer **any two** of the following : **10**
   i) Write a note on scope of genetic engineering.
   ii) Write about all the different types of PCR.
   iii) Explain the role of animal viruses as vectors.

5. Answer **any two** of the following : **10**
   i) Discuss the role of nucleic acid modifying enzymes.
   ii) Describe the method of Western Blotting.
   iii) What is cloning ? What are the different strategies of cloning ?

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SLR-J – 50

Seat No.	

B.Sc. (Semester – VI) (New) Examination, 2016
BIOTECHNOLOGY
Genetic Engineering : Applications – II

Time : 2 Hours | Total Marks : 50

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Figures to the **right** indicate **full** marks.*
*3) **Draw** neat and labeled diagrams.*

1. Rewrite the following sentences by choosing correct alternatives : **10**

1) _____ is an example of manipulation by transfer of plasmid.

a) Superbug b) pBr322 c) pUC18 d) Bugs

2) Compounds which are foreign to life exhibiting unnatural structural features are known as _____

a) Proteins b) Xenobiotics

c) Probiotics d) Antibiotics

3) Human growth hormone has _____ amino acids of molecular weight 22,125 Da.

a) 100 b) 121 c) 191 d) 181

4) _____ can be regarded as redesigning the nature rather than copying it.

a) Lipid engineering b) Engineering

c) Metallurgy d) Protein engineering

5) Sequence specific _____ of chemically synthesized oligonucleotides relies on hybridization.

a) Effectiveness b) Synthesis

c) Action d) Mechanism

6) Cystic fibrosis is related with _____ system.

a) Digestive b) Respiratory

c) Excretory d) Nervous

7) Preparation of subunit vaccine against FMDV prepared by using _____ Epitope.

a) Capsid viral protein2 b) Capsid viral protein3

c) Capsid viral protein1 d) Capsid viral protein4

8) Natural rubber _____ is an extensively used biopolymer obtained from plants.

a) Cis-1 6-polyisoprene b) Cis-1 4-polyisoprene

c) Cis-1 2-polyisoprene d) Cis-1-polyisoprene

9) Crystal shape of CRY III (Sub-group) is _____

a) Flat irregular b) Cuboidal

c) Bipyramidal d) Irregular

10) _____ portion is 3000 times sweeter than sucrose.

a) Morphin b) Monellin

c) Casein d) BSA

2. Answer the following **(any five)** : **10**

1) Write a short note on biosynthesis of rubber.

2) Write a note on subunit vaccines.

3) Explain in brief plant as a bioreactor for polymer.

4) Write a note on increase in enzyme stability.

5) Explain in brief synthesis of human growth hormone.

6) Write a note on increase in activity of enzyme.

3. A) Answer the following **(any two)** : **6**
   1) Explain cloning livestock by nuclear transfer.
   2) Write a note on edible vaccines.
   3) Explain synthesis of human interferon.

   B) Describe interfering RNA as a therapeutic agent. **4**

4. Answer the following **(any two)** : **10**
   1) Explain commercial production of fructose and alcohol.
   2) Describe modification of plant nutritional content w.r.t. amino acids and iron.
   3) Discuss in detail modification of food plants taste (sweetness).

5. Answer the following **(any two)** : **10**
   1) Discuss engineering of xanthomonas for xanthan gum production.
   2) Describe genetic engineering of biodegradative pathway by gene alteration.
   3) Explain in detail transgenic sheep.

SLR-J – 51

Seat No.	

B.Sc. – III (Semester – VI) (New) Examination, 2016
BIOTECHNOLOGY
Microbial Biotechnology : Fermentation Technology – I

Time : 2 Hours Max. Marks : 50

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Figures to ***right*** *indicate* ***full*** *marks.*

1. Multiple choice questions : **10**

i) Primary metabolites such as organic acids are produced during _____ phase of growth.

a) Lag b) Log c) Stationary d) Death

ii) The removal of solids relies on density difference between the particles to be separated by

a) Filteration b) Electrophoresis

c) Centrifugation d) None of these

iii) _____ technique is used for selection of auxotrophic mutants.

a) Alcohol b) Penicillin c) Acid d) None of these

iv) _____ used as precursor in penicillin G production.

a) Phenyl acetic acid b) Hydroxyphenyl acetic acid

c) Phenoxyacetic acid d) None of these

v) Industrial production of ethanol is carried out by using

a) E. Coli b) Saccharomyces Cerevisiae

c) Aspergillus niger d) Bacillus thuringiensis

vi) Stock culture is maintained by

a) Tyndallization b) Sterilization c) Lyophilization d) Pasteurisation

vii) Microbial inhibition spectrum of antibiotic is determined by

a) Standard plate count b) Crocoded plate technique

c) Giant colony technique d) Indicator

P.T.O.

viii) Above _____ citric acid crystallizes as unhydrous acid.

a) 40° C b) 36° C c) 34° C d) 27° C

ix) Solvent extraction is used for recovery of

a) Penicillin b) Amylase c) Alcohol d) None of these

x) For ethanol production concentration of molasses is used between

a) 30 – 40% b) 50 – 55% c) 10 – 18% d) 1 – 10%

2. Answer **any five** of the following : **10**

i) Define strain improvement and give its different methods.

ii) Give physical and chemical methods of cell disruption.

iii) Aeration and agitation.

iv) Give names of any two organisms used for industrial production of amylase.

v) Scale up of fermentation.

vi) Give different methods used for preservation and maintenance of industrially important microorganisms.

3. A) Answer **any two** of the following : **6**

i) Types of fermentation media.

ii) Primary screening.

iii) Submerged and solid state fermentations.

B) What is microbiological assay ? Describe turbidimetric and end point determination assay. **4**

4. Answer **any two** of the following : **10**

i) Application of computer in fermentation technology.

ii) Industrial production of penicillin.

iii) Strain improvement by mutation.

5. Answer **any two** of the following : **10**

i) Basic design, working, function of fermenter and its various parts.

ii) Write an account on microbial growth kinetics in batch culture and continuous culture.

iii) Filteration and centrifugation for product recovery.

_____

SLR-J – 52

Seat No.	

B.Sc. III (Semester – VI) (New) Examination, 2016
BIOTECHNOLOGY
Microbial Biotechnology : Food and Dairy Technology – II

Time : 2 Hours Max. Marks : 50

N.B. : *1)* ***All*** *questions are* ***compulsory****.*
2) Figures to ***right*** *indicate* ***full*** *marks.*

1. Rewrite the sentences using correct alternative given below : **10**

i) In ISO 9000, ISO stands for
   a) International State Organisation
   b) International Standard Organisation
   c) International Selection Organisation
   d) International Standard Opportunity

ii) Method of canning for food preservation is discovered by
   a) Louis Pasteur b) Nicolas Appert
   c) Franz Von Soxhlet d) None of these

iii) _____ organism is indicator of fecal pollution.
   a) Salmonella Typhi b) E. coli
   c) Bacillus Subtilis d) Proteus Vulgaris

iv) QUATS have _____ charge in solution hence having bacteriostatic property.
   a) Negative b) Positive
   c) Both a and b d) None of these

v) _____ is example of fermented vegetable product.
   a) Vinegar b) Sauerkraut
   c) Cheese d) None of these

P.T.O.

vi) The efficiency of pasteurisation of milk is detected by _____ test.

a) Phosphatase b) MBRT

c) Standard plate count d) Most probable number

vii) _____ are nonionizing radiations most commonly used in the food industry.

a) X-rays b) Gamma rays

c) U.V. rays d) Beta rays

viii) Ropiness in the milk is caused by _____ organism.

a) Alcaligenes Viscolactis b) E.coli

c) Pseudomonas aeruginosa d) Clostridium spp

ix) Sugar is example of _____ type of food.

a) Perishable b) Semi-perishable

c) Stable d) None of these

x) Black mold rot of onions is caused by

a) Aspergillus niger b) Cladosporium spps

c) Trichothecium roseum d) Sclerotinia spps

2. Answer **any five** of the following : **10**

i) Asepsis.

ii) Define and give significance of BS 5750, ISO 9000 series.

iii) Starter culture of microorganisms used for cheese production.

iv) Define milk and give its composition.

v) Give principle of MBRT test.

vi) Give any four chemicals used for food preservation.

3. A) Answer **any two** of the following : **6**

i) Spoilage of meat and meat products.

ii) Yoghurt production.

iii) Phosphatase test and resazurin test.

B) Write an account rapid methods of detection of toxins and morgs in food. **4**

4. Answer **any two** of the following : **10**

   i) Give general methods of food preservation.

   ii) Different steps of Hazard analysis and critical control point during food analysis.

   iii) Spoilage of milk and milk products.

5. Answer **any two** of the following : **10**

   i) Production of beer on industrial scale.

   ii) Production of cheese on Industrial scale.

   iii) Explain the chief compositional factors of a food that influence microbial activity in food.

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