SLR-CX – 1

Seat No.	

B.Sc. I (Semester – I) Biotechnology Examination, 2017
ENGLISH (Compulsory) (CBCS Pattern) (New)
'On Track' English Skills for Success

Time : 2.30 Hours Total Marks : 70

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

1. Complete the following statements by choosing the correct alternatives from those given below them. **14**

1) Jimmy and Bob dined at _____ restaurant twenty years ago.
   a) Big Brother's b) Big Boss Brandy's
   c) Big Joe' Brady's d) John Bradly's

2) The story, 'After Twenty Years' implies that 'silky' Bob is _____
   a) Private Detector b) Restaurant Owner
   c) Police Officer d) Gangster or Criminal

3) The writer met Miss. Krishna _____
   a) at an art exhibition b) at the hotel
   c) in railway d) in city bus

4) The narrator of the story 'The Connoisseur' is _____
   a) Nergis Dalal b) Sarojini Naidu c) O. Henry d) Attila Narin

5) The essential part of intelligence, as the Latin word suggests, is _____
   a) the inability to neglect the simple facts
   b) the ability to look beyond the simple the facts
   c) the inability to look at nature
   d) the ability to compete others

6) Mr. Binet developed _____
   a) IQ Test b) GK Test
   c) Aptitude Test d) Computer software

P.T.O.

7) Where are the bangle sellers carrying their wares ?
   a) to the temple fair b) to the roads
   c) to the garden d) to the married woman's house

8) The poem 'An Irish Airman Foresees His Death' is composed by _____
   a) W.B. Yeats b) Robert Frost
   c) W.H. Auden d) William Shakespeare

9) The speaker in the poem 'Bangle Sellers' is _____
   a) customers b) bangle sellers
   c) married women d) young unmarried women

10) W.B. Yeats relates the plight of _____ soldiers.
   a) American b) Irish c) African d) Indian

11) _____ Sangoli Rayanna was a great freedom fighter.
   a) An b) The c) A d) No article

12) This is the Dr. Bhujade who treated me for typhoid. The underlined word is _____
   a) proper noun b) common noun c) collective noun d) abstract noun

13) Prarthana goes to _____ school. (for education)
   a) a b) the c) an d) no article

14) Soham went to America _____ plane.
   a) by b) from c) in d) at

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

1) Why did Bob decide to travel to west ?
2) What was the policeman constantly doing with his stick ?
3) What is the meaning of the title 'The Connoisseur' ?
4) What is the narrator's initial opinion about Miss. Krishna ?
5) How can you define 'Intelligence' ?
6) What is 'virtual reality' by Attila Narin ?
7) Why does Jimmy send another policeman to arrest Bob ?
8) Why can computers not 'think' in the same way as human beings ?

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

   1) Describe the different types of bangles which the bangle sellers carry.

   2) What is the theme of 'An Irish Airman Foresees His Death' ?

   3) The speaker in 'An Irish Airman Foresees His Death'.

   B) Write a paragraph on **any two** of the following : **6**

   1) Human values are Timeless and Eternal.

   2) Solar Energy.

   3) A Decision that Changed my life.

4. Write an essay on the impact of mobile on the lives of young people in the present day. **14**

   OR

   Write an essay describing an exciting cricket match which you have seen.

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

   Drugs related health disorders are many and varied. Dirty needles and solutions used for injecting drugs can easily cause abscesses in the arms and veins, liver disease, venereal diseases and infection of the kidneys and brain. Sniffing cocaine and amphetamines can damage the tissue of the nose and Marijuana and tobacco smoking can cause lung diseases. Heavy users of alcohol, volatile solvents, amphetamines or Marijuana may find that their livers are permanently damaged. Babies of women addicted to opiates are likely to be born addicted and to suffer from withdrawal symptoms. Cocaine and amphetamines can cause hair loss. Recent research has indicated that Marijuana can damage cells. A drug user's way of life makes him more susceptible to pneumonia, tuberculosis, malnutrition and weight loss. Finally, an overdose of any of the sensual drugs can lead to respiratory or cardiac failure and death.

SLR-CX – 2

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) (New CBCS)
Examination, 2017
ECOLOGY AND MICROBIOLOGY
Paper – I : Ecology

Time : 2.30 Hours Total Marks : 70

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

i) The state of India with maximum percentage of its area covered by forest is _____
   a) Rajasthan b) Karnataka
   c) Bihar d) Madhya Pradesh

ii) _____ of these is most responsible for world water crisis.
   a) Dam b) Floods c) Drought d) Population growth

iii) A metal largely used in electricity generation is _____
   a) Gold b) Thorium c) Tin d) Mica

iv) The biggest Indian desert is
   a) Gobi b) Sahara c) Thar d) Takla Makan

v) The term ecosystem was proposed by _____
   a) Carl Mobius b) A. Tansley
   c) E. Odum d) E. Clement

vi) Photosynthesis is found in _____
   a) Producers b) Consumers
   c) Decomposers d) Primary consumers

vii) The category of primary consumer includes _____
   a) Eagles and Tigers b) Fish and Whales
   c) Snakes and frogs d) Cattles and insect

viii) Energy is returned to the free atmosphere in the form of _____
   a) Potential energy b) Metabolic energy
   c) Heat d) Vapours

P.T.O.

ix) The arrival and settlement of some organism on the bare area is called as _____

a) Migration b) Invasion c) Ecesis d) Nidation

x) The environmental day celebrated on _____

a) 12 March b) 5 June c) 10 May d) 4 Jan

xi) The fossils fuel is _____

a) Renewable b) Non renewable

c) Inexhaustible d) Non renewable and exhaustible

xii) Highest potential energy found in _____

a) Decomposer b) Producer c) Detrivore d) Consumers

xiii) International day of Biological Diversity is celebrated on _____

a) 5 June b) 2 Feb c) 22 May d) 15 Aug

xiv) According to Myers, 2000, the number of hot spots in the world is _____

a) 10 b) 12 c) 24 d) 25

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

i) Biomass
ii) Ecology
iii) Ground water
iv) Photosynthesis
v) Transpiration
vi) Heterotrophs
vii) Ist law of thermodynamics
viii) Pioneer community
ix) Nitrification.

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

i) Write a short note on Carbon cycle.
ii) Explain on, “Western Ghats”.
iii) Explain on biosphere as a life supporting layer.

B) Explain in detail ecological succession. **4**

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

   i) Give a detailed account on Mineral as a natural resource.

   ii) Explain in brief Conservation and Management of natural resources.

   iii) Explain Biodiversity in World and India.

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

   i) Discuss in detail atmosphere.

   ii) What is water conservation ? Discuss different methods of its conservation.

   iii) Explain in detail energy transfer in ecosystem with diagrammatic representation.

SLR-CX – 3

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) (CBCS) Examination, 2017
MICROBIOLOGY (Paper – II) (New)
Ecology and Microbiology

Time : 2.30 Hours | Total Marks : 70

N.B. : *1) **All** questions are **compulsory** and carry **equal** marks.*
*2) Draw a **neat** labeled diagram **wherever** necessary.*
*3) Figure to the **right** indicates **full** marks.*

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

i) _____ type of ribosome is present in prokaryotic cell.

a) 70 S b) 80 S
c) 90 S d) 100 S

ii) _____ is the causative agent of tuberculosis disease.

a) *E.coli* b) *Pseudomonas*
c) *Aspergillus niger* d) *Mycobacterium*

iii) Circular or round shaped bacteria are known as _____

a) Cocci b) Comma forms
c) Bacilli d) Pleomorphic form

iv) Father of Microbiology is _____

a) Antony Van Leeuwenhoek b) Louis Pasture
c) Edward Jenner d) Robert Koch

v) _____ is example of protozoa.

a) *Penicillin* b) *Fungi*
c) *Amoeba* d) *Bacteriophage*

vi) _____ are the strict intracellular parasites.

a) Viruses b) Fungi

c) Algae d) None

vii) _____ is an indicator organism of faecal pollution.

a) *E.coli* b) *Pseudomonas*

c) *Aspergillus niger* d) *Penicillium*

viii) The protein coat of virus is called as _____

a) Nucleid b) Capsid

c) Envelope d) None

ix) _____ is the structural component of bacterial cell membrane.

a) Amino sugar b) Phospholipid

c) Nucleic acid d) None

x) Mycoplasma organism shows absence of _____

a) Cell wall b) Cell membrane

c) Ribosomes d) None

xi) The major locomotory structure of bacterial cell is _____

a) Cell wall b) Cell membrane

c) Capsule d) Flagella

xii) *Bacillus anthracis* is causative agent of anthrax was discovered by _____

a) Joseph Lister b) Louis Pasture

c) Edward Jenner d) Robert Koch

xiii) Teichoic acid is present in cell wall of _____ bacteria.

a) Gram negative b) Gram Positive

c) Fungi d) Algae

xiv) _____ is the sex organ of some bacteria.

a) Flagella b) Pili

c) Ribosomes d) Mesosomes

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

   i) Function of bacterial cell wall.

   ii) What is abiogenesis ?

   iii) Define Mycology.

   iv) Function of Flagella.

   v) Define Dairy Microbiology.

   vi) Archaebacteria.

   vii) Slime layer.

   viii) Define Pasteurization.

   ix) Alexander Fleming.

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

      i) Explain in detail spontaneous generation theory.

      ii) Describe in detail beneficial activities of microorganisms.

      iii) Describe in detail general characteristic of fungi.

   B) Write difference between prokaryotic and eukaryotic cell. **4**

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

   i) Describe in detail applied branches of microbiology.

   ii) Explain in detail structure of bacterial cell membrane.

   iii) Describe in types of microorganism.

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

   i) Explain in detail structure and function of endospore.

   ii) Write in detail general characteristic of Rickettsia and Mycoplasma.

   iii) Explain in detail structure of cell wall of bacteria.

SLR-CX – 4

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) (CBCS) Examination, 2017
INTRODUCTION TO BIOSCIENCES (New)
Paper – I : Animal Sciences

Time : 2.30 Hours Total Marks : 70

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

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

1) A portion between _____ is called sarcomere in muscle cells.
   a) 'Z' lines b) 'A' lines
   c) 'H' lines d) 'T' lines

2) The nervous tissue originates from _____
   a) Ectoderm b) Mesoderm
   c) Endoderm d) All of these

3) Which of the following does not manufacture digestive juice ?
   a) Kidney b) Stomach
   c) Liver d) Pancreas

4) The outer most tissue layer surrounding the kidney is _____
   a) Renal fascia b) Fibrous capsule
   c) Perinephric fat d) Paranephric fat

5) The tip of the renal pyramid that projects towards the renal sinus _____
   a) Renal papilla b) Renal column
   c) Renal capsule d) Renal pelvis

6) Salivary amylase brings about the digestion of _____

a) Protein
b) Fat
c) Carbohydrates
d) Vitamins

7) A location where honey bees are kept is called as _____

a) Apiary
b) Bee yard
c) Both a and b
d) None of these

8) *Plasmodium vivax* have a incubation period may be delayed for as long as _____

a) 1-2 weeks
b) 6-9 months
c) 12-14 months
d) 2-3 weeks

9) The mulberry silkworm is _____

a) *Antheraea mylitta*
b) *Antheraea assamensis*
c) *Antheraea paphia*
d) *Bombyx mori*

10) Inland fishery is _____

a) In fresh water
b) Fishing in Islands
c) Fish culture in pond
d) Fishing inside water

11) The earthworm is called friend of farmer because _____

a) They are protein rich
b) They are used to remove agricultural work
c) They help in reducing pollution
d) They make a soil soft and fertile

12) The study of the natural history of animal behaviour is _____

a) Etiology
b) Physiology
c) Ethology
d) Psychology

13) Which of the following is the hardest substance ?

a) Root of teeth
b) Enamel teeth
c) Crown of teeth
d) Dentine of teeth

14) Which cell out of the following are phagocytic in nature ?

a) Hepatocytes
b) Kuffer cells
c) Interstitial cells
d) Acinar cells

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

   i) Give the characteristics of connective tissue.

   ii) What is the cause and treatment of amoebic dysentery ?

   iii) Write a note on Ascariasis.

   iv) Explain the worker honey bee.

   v) Give the importance of vermiculture.

   vi) Which are the four main types of tissues ?

   vii) What are the type's earthworms ?

   viii) Distinguish between striated and non striated muscle fibres.

   ix) Draw a neat and labelled T.S. tooth.

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

      i) Explain in detail T.S. of Pancreas and T.S. of liver.

      ii) Describe Courtship behaviour in birds.

      iii) Write in brief about aquaculture.

   B) Give the location, structure and function of adipose tissue. **4**

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

   i) Write a note on life cycle of Malarial parasite.

   ii) Describe in detail types of neuron.

   iii) Explain the mimicry of butterfly.

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

   i) Explain in detail histology of pituitary gland.

   ii) Write a note on life cycle of *Fasciola hepatica*.

   iii) What is cartilage ? Describe the different types of cartilage.

SLR-CX – 5

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) (New CBCS) Examination, 2017
INTRODUCTION TO BIOSCIENCES
Paper – II : PLANT SCIENCES

Time : 2.30 Hours | Total Marks : 70

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

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

1) In dicot stem vascular bundles are _____
   a) Conjoint collateral open
   b) Conjoint collateral closed
   c) Radial
   d) Concentric

2) In epigynous flower the ovary is _____
   a) Superior
   b) Inferior
   c) Half superior
   d) Half inferior

3) The flowers pollinated by wind are called as _____
   a) Anemophilous
   b) Ornithophelous
   c) Entamophelous
   d) Malacophelous

4) Double fertilization is characteristic feature of _____
   a) Bryophyta
   b) Pteridophyta
   c) Gymnosperm
   d) Angiosperm

5) _____ is the example of complex tissue.
   a) Parenchyma
   b) Xylem
   c) Epidermis
   d) Cortex

6) Girth of plant increased due to the _____

a) Apical meristem
b) Lateral meristem
c) Intercalary meristem
d) Parenchyma

7) The caspirian strips are made from _____

a) Cutin
b) Lignin
c) Suberin
d) Cellulose

8) Acacia is _____ type of fruit.

a) Pepo
b) Lomentum
c) Drupe
d) Hysperdium

9) *Nostoc* is _____

a) Algae
b) Fungi
c) Bryophyte
d) Pteridophyte

10) The rib meristem divides in _____

a) One plane
b) Two planes
c) Three planes
d) All planes

11) Apical cell theory proposed by _____

a) Hofmeister
b) Nageli
c) Strasburger
d) Haberlandt

12) Pollination by birds is called _____

a) Anemophily
b) Entomophily
c) Ornithophily
d) Hydrophily

13) In angiosperm triple fusion is required for the formation of _____

a) Embryo b) Suspensor

c) Fruit wall d) Endosperm

14) Alcoholic beverages prepared from _____

a) Rice b) Grape

c) Pomegranate d) All of the above

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

1) Write any two economic importance of Pteridophyte.

2) Give functions of meristem.

3) What is fertilization ?

4) What is normal secondary growth ?

5) Enlist the Modifications of Calyx.

6) Describe the types of aggregate fruits.

7) Describe phases of growth.

8) Write the functions of Xylem.

9) Draw neat labeled diagram seed.

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

1) Describe Histogen theory.

2) Explain types of vascular bundle with suitable diagram.

3) Write economic importance of gymnosperm.

B) Write a note on development of female gametophyte. **4**

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

   1) Describe structure of stamen with suitable diagram.

   2) Give economic importance of Pteridophytes.

   3) What is fertilization ? Describe the process of fertilization.

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

   1) Describe primary structure in Dicot.

   2) Give an account on origin of staple food.

   3) What is tissue ? Describe structure and function of simple tissue.

SLR-CX – 6

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) Examination, 2017
(New CBCS Pattern)
FUNDAMENTALS OF CHEMISTRY AND BIOPHYSICS
Paper – I : Chemical Sciences

Time : 2.30 Hours Total Marks : 70

***N.B.** : 1) **All** questions are **compulsory**.*
*2) Figures to the **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 hybridized carbon is _____ A°.
a) 1.54 b) 1.33 c) 1.44 d) 2.25

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

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

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

5) When weight of compound equal to one gram is dissolved in 100 ml of solvent the solution will be one _____ solution.
a) Molar b) Normal c) Molal d) Percent

6) _____ is an example of polar solvent.
   a) Ethyl alcohol b) Benzene
   c) Xylene d) Carbon tetrachloride

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

8) The integrated rate expression for first order reaction is _____
   a) $k = 2.303/t \times \log a/(a - x)$ b) $k = 2.303/t \times \log b/(a - x)$
   c) $k = \log b/(a - x)$ d) $k = \log a/(a - x)$

9) pH value of acidic buffer has _____ range of pH.
   a) 9-12 b) 2-6
   c) 7-9 d) 7-14

10) _____ is used as an indicator for complexometric titration.
   a) Phenolphthalein b) Methyl orange
   c) Eriochrome Black-T d) EDTA

11) H-C-H bond angle in ethyene is _____
   a) $109^{\circ}28'$ b) 120° c) 180° d) 107°

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

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

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 second order reactions with equal and unequal concentrations.

   2) What is common ion effect ?

   3) Give any two general characteristics of covalent solids.

   4) Mention any two factors affecting solubility.

   5) Define reverse osmosos, give one example.

   6) Define hybridization, mention its types.

   7) Define bond length and bond energy.

   8) What is one normal solution ?

   9) Give any two general characteristics of enzyme catalyzed reaction.

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

      1) Explain normality and molality with example.

      2) Define solvation energy explain various factors affecting solubility.

      3) Write a note on enzyme catalyzed reactions.

   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 75% of the reactant. **4**

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

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

   2) Derive an integrated rate expression for first order reaction.

   3) Explain concept of sp^3 hybridization with respect to CH_4 molecule.

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

   1) Derive Henderson equation for acidic buffers.

   2) Give comparison between ionic and covalent compounds.

   3) What is osmotic pressure ? Explain concept of osmosis and reverse osmosis.

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SLR-CX – 7

Seat No.	

B.Sc. (Part – I) (Semester – I) Biotechnology (CBCS Pattern) Examination, 2017
FUNDAMENTALS OF CHEMISTRY AND BIOPHYSICS (New)
Biophysics (Paper – II)

Time : 2.30 Hours Total Marks : 70

N.B.: *i)* ***All*** *questions are* ***compulsory****.*
ii) Figures to the ***right*** *indicate* ***full*** *marks.*
iii) ***Neat*** *and well labelled diagrams must be drawn* ***wherever*** *necessary.*
iv) Answer to ***every*** *question must be written on a* ***new*** *page.*

1. Select and write the most **appropriate** answer from the given alternatives for **each** sub-question : **14**

i) Highest elasticity is possessed by _____
a) Copper b) Steel c) Glass d) Rubber

ii) A body which does not undergo any deformation under the action of deforming force is called _____
a) Soft b) Plastic c) Rigid d) Elastic

iii) Young's modulus for perfectly elastic body is _____
a) Zero b) One c) Finite d) Infinite

iv) Velocity of fluid flowing through tube is 'v'. Radius of tube is 'r'. The relation between 'v' and 'r' is_____
a) $v \& \frac{1}{r}$ b) $V \& r$ c) $V \& \frac{1}{r^2}$ d) $V \& r^2$

v) The property of liquid by virtue of which it opposes relative motion between its adjacent layers is called _____
a) Turbulently b) Elasticity
c) Surface tension d) Viscosity

P.T.O.

vi) With the increase of pressure, the viscosity of viscous fluid _____

a) Increases b) Decreases
c) Remain constant d) Become Zero

vii) When the common salt is dissolved in pure water, the surface tension of a solution in comparison with surface tension of pure water is _____

a) Double b) Half c) Less d) Greater

viii) A liquid will completely wets the solid surface if its angle of contact is _____

a) 0° b) 30° c) 45° d) 60°

ix) When the radius of capillary tube is doubled, the rise of water in capillary tube will be _____

a) Same b) Double c) Four times d) Half

x) Example of the mechanical wave is _____

a) Sound wave b) Light wave
c) Radio wave d) X – rays

xi) Formation of beats is by the phenomenon of _____

a) Polarisation b) Interference
c) Reflection d) Refraction

xii) If V_1 is velocity of light in rarer medium, V_2 is velocity of light in denser medium. The relation between V_1 and V_2 is _____

a) $V_1 = V_2$ b) $V_1 = 2\,V_2$ c) $V_1 < V_2$ d) $V_1 > V_2$

xiii) Type of pumping used in Helium-Neon Laser is _____

a) Electrical b) Optical
c) Chemical d) Electro-Chemical

xiv) An angle of incidence i = 25°. By the law of reflection an angle of reflection r is _____

a) 60° b) 40° c) 25° d) 10°

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

   i) Write an expression for the Young's Modulus of material of wire.

   ii) What is a stream line flow of liquid ?

   iii) Write the Bernoulli's equation.

   iv) What is meant by capillarity ?

   v) State the applications of surface tension.

   vi) Describe the stimulated emission of radiation.

   vii) State Hooke's Law of Elasticity.

   viii) State the principle of superposition of waves.

   ix) State Brewster's Law.

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

      i) Describe the behaviour of wire under increasing load with the help of stress-strain curve.

      ii) State Newton's Law of Viscosity and define the SI and CGS units of coefficient of viscosity.

      iii) Explain the phenomenon of : Dispersion and Diffraction of light.

   B) Define surface tension and state the factors affecting it. **4**

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

   i) Describe three types of moduli of elasticity and state the relation between them.

   ii) What is a venturi meter ? Briefly explain its use to determine the flow rate in a pipe.

   iii) What is Doppler effect ? State the applications of it.

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

   i) Explain the characteristics of : transverse, longitudinal and ultrasonic waves. State the applications of ultrasonic waves.

   ii) Describe Jaeger's method used for measurement of surface tension.

   iii) Explain the construction and working of Nicol Prism.

SLR-CX – 8

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) (CBCS) Examination, 2017
CELL BIOLOGY AND BIOSTATISTICS (New)
Paper – I : Cell Biology

Time : 2.30 Hours | Total Marks : 70

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

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

1) Cells will usually divide if they receive the proper signal at a _____ phase.

a) M b) S

c) G2 d) G1

2) DNA molecule is a polymer made of subunits called _____

a) Bases b) Amino acids

c) Nucleotides d) Nucleic acids

3) Mitosis and cytokinesis of a somatic cell result in the formation of _____

a) 4 diploid cells b) 2 diploid cells

c) 4 haploid cells d) 2 haploid cells

4) Regions where nonsister chromatids cross are called _____

a) Inversions b) Homologues

c) Tetrads d) Chiasmata

5) _____ would not be considered part of a cell's cytoplasm.
   a) Ribosome
   b) Nucleus
   c) Mitochondrion
   d) Microtubule

6) In plants, Golgi bodies are also called as _____
   a) Dictyosomes
   b) Mitochondria
   c) Ribosomes
   d) Sarcomere

7) _____ is a site of ribosome synthesis.
   a) Nucleolus
   b) Endoplasmic reticulum
   c) Mitochondrion
   d) Microtubule

8) *Cell cycle* consists of _____
   a) M phase and interphase
   b) Interphase and S phase
   c) Mitosis and meiosis
   d) Mitosis and cytokinesis

9) Mycoplasma are _____
   a) PPLOs
   b) Bacteria without cell wall
   c) Pleuro Pneumonia Like Organisms
   d) All the above

10) Degeneracy of the genetic code means that _____
   a) A given base triplet can code for more than one amino acid
   b) There is no punctuation in the code sequence
   c) The third base in a codon is net important for coding
   d) A given amino acid can be coded for by more than one base triplet

11) Eukaryotic and prokaryotic cells share all the following EXCEPT
   a) Ribosome dependent proteins synthesis
   b) ATP synthesis linked to a protein gradient
   c) A selectively permeable membrane
   d) A cytoskeleton of tubulin

12) Giant Chromosomes are _____
   a) Salivary gland chromosomes
   b) Lampbrush chromosomes
   c) Those chromosomes help in rapid synthesis of proteins
   d) All the above

13) _____ is a type of diffusion in which an ion or molecule crossing a membrane moves down its electrochemical or concentration gradient.

a) Active transport b) Active diffusion
c) Inactive transport d) Passive transport

14) _____ are fine hydrophilic channels formed by special protein cylinders or connexons of two adjacent cells.

a) Gap Junctions b) Tight junctions
c) Vesicles d) Nuclear pores

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

1) Define osmosis. Give an example of it.
2) Write any two differences between animal and plant cells.
3) Draw a labeled diagram of ultra structure of Golgi complex.
4) What is heterochromatin and euchromatin ?
5) Write any two functions of cell wall.
6) Define mitosis and enlist the stages.
7) Explain wobble hypothesis.
8) What is apoptosis ?
9) Define phagocytosis and give an example of phagocytic cell.

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

1) Discuss the properties of genetic code.
2) Explain the Fluid Mosaic Model of Plasma Membrane.
3) Explain the structure and functions of the mitochondria.

B) Explain ultra-structure of plant cell. **4**

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

   1) Give a detailed account on chromosome.

   2) Explain in detail cytoskeleton and its components.

   3) What is meiosis ? Explain the process in detail.

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

   1) Give a detailed account on differentiation of cell membrane.

   2) Give an account on Membrane transport.

   3) Which type of cell division occurs in somatic cells ? Explain the process in detail.

SLR-CX – 9

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) (New CBCS) Examination, 2017
Paper – II : Biostatistics
CELL BIOLOGY AND BIOSTATISTICS

Time : 2.30 Hours | Total Marks : 70

Instructions : *1)* ***All*** *questions are* ***compulsory****.*
2) Figures to ***right*** *indicate* ***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) Statistical results are
   a) Absolutely correct
   b) Not true
   c) True on average
   d) Universally true

2) Ogives for more than type and less than type distributions intersect at
   a) Mean
   b) Median
   c) Mode
   d) Origin

3) If the sum of N observations is 630 and their mean is 42, then the value of N is
   a) 21
   b) 30
   c) 15
   d) 20

4) A frequency distribution having two modes is said to be
   a) Unimodal
   b) Bimodal
   c) Trimodal
   d) Without mode

5) In an ordered series, the data are
   a) In ascending order
   b) In descending order
   c) Either (a) or (b)
   d) Neither (a) or (b)

P.T.O.

6) The mean of 9 observations is 9. Two new observations 14 and 15 are added. The mean of all observations is

a) 9 b) 14

c) 15 d) 10

7) If the constant value 5 is subtracted from each observation of a set, the variance is

a) Increased by 25 b) Decreased by 5

c) Decreased by 25 d) Not changed

8) Given the two lines of regression as $X + Y = 7$ and $X - Y = 1$, then

a) $\overline{X} = 4, \overline{Y} = 5$ b) $\overline{X} = 4, \overline{Y} = 3$

c) $\overline{X} = 4, \overline{Y} = 1$ d) $\overline{X} = 0, \overline{Y} = 7$

9) The value of correlation varies from

a) – 1 to 1 b) – 1 to 0

c) 0 to 1 d) 0 to ∞

10) If the probability of occurring of an event is 0, then the event is called

a) Impossible event b) Special event

c) Sure event d) Independent event

11) The Addition Rule for the probability is used to compute probability for

a) Independent events b) Mutually exclusive events

c) Impossible events d) Dependent events

12) If P(A) = 0.6, P(B) = 0.5 and P(A $\cup$ B) = 0.9, then P(A $\cap$ B) is

a) 0.1 b) 0.2 c) 0.3 d) 0.6

13) If a regular six sided die is rolled, then "Rolling a prime number" is the set

a) {2, 3, 5} b) {1, 3, 5} c) {3, 5} d) {1, 2, 3}

14) A claim or statement about a population parameter is classified as

a) Null hypothesis b) Alternate hypothesis

c) P-value d) F-value

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

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

2) State significances of 'Mode'.

3) Find the median of the 87, 72, 33, 29, 70, 86, 53, 91, 66, 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 $b_{yx} = 0.9, b_{xy} = 0.4$.

6) What is the probability of getting a "multiple of 3" in single throw with die ?

7) If P(A) = 0.2, P(B) = 0.6 and P(A $\cap$ B) = 0.12. Are *A* and *B* dependent events ?

8) If standard deviation σ = 0.46 and N = 10 then find standard error.

9) If standard deviation σ = 2.76 and mean $\bar{x}$ = 14.8 find the coefficient of variation.

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

1) Find the median from the following data :

Marks	0-5	5-10	10-15	15-20	20-25
No. of Students	9	10	31	24	16

2) Write a note on "Scatter diagram and its use" with illustrations.

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

B) Solve the following : **4**

Draw the histogram for the following data.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No.of Students	5	7	10	15	12	9	8	6

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

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

X	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
F	5	6	8	12	16	25	10	8	6	4

2) Find the coefficient of correlation from the following case.

Age of fish in days X	5	10	15	20	25	30	35
Weight in grams Y	3	7	12	15	20	25	30

3) Find the standard deviation from the following data.

Weight (in pounds)	8	9	10	11	12	13	16
No. of babies	2	1	2	6	3	1	1

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

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

X	2	4	6	8	10
Y	5	7	9	8	11

2) A coin is tossed 50 times of which head comes 20 times and tail 30 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-CX – 11

Seat No.	

B.Sc. – I (Semester – I) (CGPA) Examination, 2017
BIOTECHNOLOGY (Old)
Ecology and Microbiology

Time : 2.30 Hours | Total Marks : 70

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

PAPER – I
(Ecology)

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

1) _____ percentage of solar radiation is used in photosynthesis.
a) 2% b) 8% c) 10% d) 4%

2) Which of the following is primary consumer ?
a) Frog b) Cow
c) Wolf d) Tiger

3) The seismic waves are passing through _____
a) Earth's core b) Earth's mantle
c) Earth's crust d) None of the above

4) _____ rocks are formed by cooling of molten magma.
a) Sedimentary rock b) Metamorphic rock
c) Igneous rock d) All the above

5) In stratosphere layer, temperature is increases due to presence of _____
a) Ozone b) Carbon dioxide
c) Methane d) Carbon monoxide

P.T.O.

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

1) Explain primary productivity.
2) What is Endangered species ?
3) Explain water budget on earth.
4) What is biosphere ?
5) Draw the nitrogen cycle.
6) Explain Narmada bachao andolan.
7) Explain stratosphere.

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

1) Explain three types of ecological pyramid.
2) Explain water as an natural resource.
3) Explain national parks with suitable example.

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

1) Explain importance of biodiversity and write down the threats to biodiversity.
2) Explain four layers or segment of environment and write down structure and composition of atmosphere in detail.

PAPER – II
(Microbiology)

1. Rewrite the following sentences by choosing **correct** alternative given below : **5**

1) _____ is example of thermophilic bacteria.
   a) Halococcus b) E.coli
   c) Thiobacillus d) Thermus aquatics

2) The protein subunit of viral capsid is called as _____
   a) Monomer b) Envelope
   c) Capsomer d) Polymer

3) Antiseptic surgery and pure culture technique was developed by _____
   a) Joseph Lister b) Alexander Fleming
   c) John Tyndall d) Edward Jenner

4) Microorganisms showing characters of prokaryotic as well as eukaryotic are _____

a) Mycoplasma b) Rickettsia
c) Archaebacteria d) Actinomycets

5) Spore is a _____ stage of cell.

a) Active b) Growing
c) Dormant d) Vegetative

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

1) General characteristics of mycoplasma.

2) Define and explain capsomer.

3) Give any four Louis Pasteur contributions in Microbiology.

4) Give examples of reserve food materials in bacteria.

5) Give examples of any two protozoa.

6) Give any four characteristics of Algae.

7) Give any four characteristics of Eukaryotic cell.

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

1) Structure and function of Flagella in bacteria.

2) Air microbiology and its applications.

3) Explain development of microscope.

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

i) Write an account on classification of viruses.

ii) Write an account on beneficial and harmful activities of microorganisms.

_____

SLR-CX – 12

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) (Old CGPA) Examination, 2017
INTRODUCTION TO BIOSCIENCES

Time : 2.30 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*** *labeled diagram* ***wherever*** *necessary.*

4) Figure to the ***right*** *indicate* ***full*** *marks.*

PAPER – I
(Plant Science)

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

1) In dicot stem vascular bundles are _____
   a) Conjoint collateral open
   b) Conjoint collateral closed
   c) Radial
   d) Concentric

2) In epigynous flower the ovary is _____
   a) Superior
   b) Inferior
   c) Half superior
   d) Half inferior

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

4) Double fertilization is characteristic feature of _____
   a) Bryophyta
   b) Pteridophyta
   c) Gymnosperm
   d) Angiosperm

5) _____ is the example of short day plant.
   a) Wheat
   b) Maize
   c) Radish
   d) Xanthium

2. Answer **any five** of the following : **10**
   i) Write any five objectives of plant taxonomy.
   ii) Write general characters of Bryophytes.
   iii) Describe composite fruits.
   iv) Cohesion in androecium.
   v) Describe forms of Corolla.
   vi) What are annual rings ?
   vii) Factors affecting viability of seed.

3. Write short notes on **any two** of the following : **10**
   i) Write note on aggregate fruit.
   ii) Give an account on Vernalization.
   iii) Give general classification of Plant kingdom.

4. Answer **any one** of the following : **10**
   i) What is Secondary growth ? Describe normal secondary growth in dicot stem.
   ii) What are phytohormones ? Give an account on practical application of GA.

PAPER – II
(Animal Science)

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

   1) _____ are the sets of animals have larva in embryonic development.
      a) Lizard, Frog, Cockroach
      b) Ascaris, Frog, Housefly
      c) Mosquito, Earthworm, Housefly
      d) Honeybee, Mosquito, Hydra

   2) Birds are gloridied _____
      a) Vertebrates
      b) Fishes
      c) Amphibians
      d) Reptiles

   3) _____ is known as father of Zoology.
      a) Aristotle
      b) Robert Koch
      c) Charles Darwin
      d) Gregor Mendel

4) Flat worms are _____
   a) Acoelomates
   b) Pseudocoelomates
   c) Partial Coelomates
   d) Eucoelomates

5) _____ is know to cause malaria.
   a) Bacillus species
   b) Mycobacterium species
   c) Plasmodium species
   d) Schistosoma species

2. Answer **any five** of the following : **10**
   1) What is apiculture ?
   2) What are the special features of a Annelida ?
   3) Host parasite relationship.
   4) Give the difference between Non-chordate and Chordate.
   5) Give the classification of Phylum Hemichordata with example.
   6) Short notes on Protozoa.
   7) Give any two disease of silkworm.

3. Write short notes on **any two** of the following : **10**
   1) Write the general characters of phylum Echinodermata and mention their classes with one example.
   2) Describe Vermiculture and add a note on factors required for Vermiculture.
   3) Write the general characters of class Amphibia with example.

4. Answer **any one** of the following : **10**
   1) Give detail account on Nematode parasites.
   2) Write the general characters of Phylum Porifera and classify this phylum with one example of each class.

SLR-CX – 13

Seat No.	

B.Sc. – I (Semester – I) Examination, 2017
(CGPA Pattern)
BIOTECHNOLOGY (Old)
Fundamentals of Chemistry and Bio-physics

Time : 2.30 Hours | Total 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)

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

1) For _____ ΔH_f is not zero.
a) Ca(s) b) He(g) c) P(red) d) $CH_3OH(l)$

2) The ionic product of water is _____ $mol^{-2}dm^{-3}$.
a) 10^7 b) 10^{-7}
c) 10^{-14} d) None of the above

3) The slope of graph by plotting k against C for first order reaction is
a) –K b) –K/2.303
c) K d) K/2.303

4) _____ involves sp^2 hybridization of carbon.
a) Methane b) Ethane c) Ethene d) Acetylene

5) The value of constant in Nerst equation $E = E^\circ$– constant/n X In Q at 25° C is _____
a) 0.0592 mV b) 0.0592 V c) 25.67 mV d) 0.0296 V

P.T.O.

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

   1) Draw neat labelled diagram of glass electrode.

   2) Calculate pH of 0.001M H_2SO_4 solution assuming complete dissociation.

   3) What is first order reaction ? Give one example.

   4) What is homogeneous catalysis ? Give one example.

   5) Define pH and pOH.

   6) Explain first law of thermodynamics.

3. A) Attempt **any two** of the following : **20**

   1) Explain electrolysis of fused NaCl in detail.

   2) Explain sp^2 hybridization of carbon with suitable example.

   3) What are basic buffers ? Explain mechanism of its action.

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

   1) What is homogeneous and heterogeneous catalysis ? Give examples. What is bio-catalysis mention its characteristics and advantage ?

   2) Derive the expression for first order rate constant. For the first order reaction rate constant is 6.8×10^{-4} and initial concentration is 0.04 M how long it will take to for 75% reactant to react.

PAPER – II
(Biophysics)

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

   i) In Helium-Neon laser, the type of pumping used is _____

   a) Optical b) Electrical

   c) Chemical d) Thermal

   ii) The SI unit of stress is _____

   a) N/m^2 b) $dyne/cm^2$

   c) kg/sec^2 d) cm/sec^2

iii) The angle of contact is _____ for the liquid which does not wet the solid.

a) Zero b) Acute c) Right angle d) Obtuse

iv) According to Brewster's law, polarising angle (i_p) and refractive index (μ) are related as _____

a) $\mu = \tan (i_p)$ b) $\mu = \sin (i_p)$

c) $\mu = \cos (i_p)$ d) $\mu = i_p$

v) Audible range of frequency is _____

a) 20 Hz to 200 kHz b) 1 Hz to 20 kHz

c) 20 Hz to 20 kHz d) 10 Hz to 10 kHz

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

1) What is Doppler effect ?
2) Define a) Range of molecular attraction
   b) Sphere of influence.
3) What is the phenomenon of double refraction of light ?
4) What do you mean by capillary action ?
5) What do you mean by population inversion ?
6) State any four characteristics of transverse waves.
7) What do you mean by streamline flow and turbulent flow ?

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

1) What are ultrasonic waves ? Explain in brief any two applications of ultrasonic waves.
2) Write a note on Nicol Prism.
3) Discuss factors affecting the surface tension.

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

1) State Bernoulli's theorem and explain the working of venturimeter.
2) Define stress and strain. State Hooke's law. Explain stress strain curve within and beyond elastic limit.

_____

SLR-CX – 14

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) (CGPA) Examination, 2017
CELL BIOLOGY AND BIOSTATISTICS (Old)

Time : 2.30 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 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) Protein factories of the cells are _____

a) Mitochondria b) Lysosome
c) Chloroplast d) Ribosomes

2) _____ phase of cell division chromosomes are arranged at equator of the cell.

a) Prophase b) Metaphase
c) Telophase d) Anaphase

3) _____ is an characteristic of cancerous cell.

a) Metastasis b) Angiogenesis
c) Uncontrolled cell division d) All of these

4) _____ is an initiation codon.

a) UAA b) UGA

c) UAG d) AUG

5) Microfilaments are polymer of _____

a) Tubulin dimer b) Globular actin

c) Keratin d) None of these

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

i) Enlist properties of cancer cells.

ii) Give significance of meiosis.

iii) What are Centrioles ?

iv) What is endocrine signaling ?

v) What are actin filaments ?

vi) What is Wobble hypothesis ?

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

i) Describe the properties of genetic code with suitable examples.

ii) Describe ultra structure of typical animal cell.

iii) Explain structure, assembly and functions of microtubules.

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

i) Describe process of mitosis and add a note on its significance.

ii) Describe of process of protein trafficking in chloroplast, mitochondria and nucleus.

PAPER – II
(BIOSTATISTICS)

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

1) In a table the headings of the rows given in the first column are called

a) Stubs b) Captions

c) Titles d) Source Note

2) The mean of 9 observations is 9. Two new observations 14 and 15 are added. The mean of all observations is

a) 9 b) 14

c) 15 d) 10

3) If the constant value 5 is subtracted from each observation of a set, the variance is

a) Increased by 25 b) Decreased by 5

c) Decreased by 25 d) Not changed

4) Probability can take values from

a) $-\infty$ to ∞ b) – 1 to 1

c) 0 to 1 d) 1 to ∞

5) 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) . P(B)

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

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

2) State demerits of 'Median'.

3) The mean age of 40 students is 16 years, and the mean age of 60 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, 164, 79, 39, 121, 116, 55.

5) Find the correlation coefficient (r), if $b_{yx} = 1.6$, $b_{xy} = 0.4$.

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

7) If P (A) = 0.4, P (B) = 0.3 and $P(A \cap B) = 0.2$, Find P $\left(A/B\right)$.

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

1) Construct a Frequency Polygon for the following data :

P	100 -150	150 - 200	200 - 250	250 - 300
Q	4	6	13	5

2) Calculate the median from the following data :

Expenditure	0 –10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency	14	23	27	21	15

3) State properties of 'Normal probability curve'.

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

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

X	5	9	13	17	21
Y	12	20	25	33	35

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

X	2	3	5	7	9	10	12	15
Y	2	5	8	10	12	14	15	16

SLR-CX – 15

Seat No.	

B.Sc. – I (Semester – II) Biotechnology (CBCS) (New) Examination, 2017
ENGLISH (Comp.)
On Track : English Skills for Success

Time : 2½ Hours Max. Marks : 70

1. Complete the following sentences by choosing the correct alternatives from those given below them : **14**

1) The V-2 missile became the first missile to exceed the
   a) speed of motor b) speed of sound
   c) speed of computer d) none

2) _____ is the denominator among all successful men and women.
   a) Partial interest b) Total discipline
   c) Total commitment d) Partial commitment

3) The Parliament of Religions was to be held in
   a) America b) Canada
   c) Singapore d) India

4) Who represented the Jains at the Parliament of Religions ?
   a) Swami Vivekananda b) Annie Besant
   c) Gandhi d) Pratap Chunder Mozoomdar

5) According to Nani A. Palkhivala human rights may be summed up in one word
   a) survival b) fraternity
   c) freedom d) none

6) The main reason for serious economic problems of the majority is
   a) famine b) negligence
   c) drought d) ignorance

7) Nani A. Palkhivala's ultimate aim was to establish _____ as a social mandate.
   a) Dharma b) Constitution
   c) Secularism d) None

8) Ralph Emerson's 'Brahma' speaks about the relationship between
   a) the soul and surrounding world
   b) the body and surrounding world
   c) the soul and body
   d) the poet and soul

9) Robert Hayden _____ mankind's relationship with the moon.
   a) ponders on b) rejects
   c) prays d) none

10) Ralph Emerson is an advocate of
   a) transcendentalism b) all religions
   c) west philosophy d) none

11) That is the _____ important thing of all for Kisan.
   a) list b) least c) lest d) little

12) The _____ congratulated the best student of the college.
   a) principle b) principal
   c) prencipal d) principles

13) Mr. Kokane cannot drink _____ coffee without your company.
   a) her b) his c) their d) your

14) The correct antonym of 'expensive' is
   a) cheap b) chief c) poor d) best

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

1) What happend to the first V-2 missile when it was first tested ?
2) What is 'flow' according to Dr. A. P. J. Abdul Kalam ?
3) Describe Vivekananda's meeting with J. H. Wright.
4) What kind of personality was Wernher von Braun according to Dr. Kalam ?
5) How was Vivekananda's speech at the Parliament of Religions different from those of the other speakers ?
6) Why does Palkhivala say that the world continues to be 'less than half free' ?
7) Enumerate the signs of hope for a better world that Palkhivala sees.
8) How did Vivekananda begin his speech in Parliament of religion ?

3. A) Write short answers on **any two** of the following : **8**
   1) What is the message of the poem 'Brahma' by Emerson ?
   2) How does Hayden Lament the Moon's Fate ?
   3) What is Emerson's concept of 'Brahma' ?

   B) Write short answers on **any two** of the following : **6**
   1) As the Principal of college, write a notice informing students about Annual Social Gathering. Mention day, date and events.
   2) What is an agenda ?
   3) What do you mean by minutes ?

4. Answer **any one** of the following questions : **14**

   A) You are Dr. Tanaji Bhand, Secretary of Prabodhan Academy. The well known speaker has been called to deliver lecture on M.P.S.C. examinations. Write a notice and agenda informing members of the academy. Imagine necessary details.

   OR

   B) You have received an email letter of appointment for the post of Assistant Manager at Spark Consulting Company, Pune. Write an email letter accepting the offer.

5. Prepare the curriculum vitae of a science graduate who has applied for the post Sales Executive. **14**

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SLR-CX – 16

Seat No.	

B.Sc. – I (Semester – II) (Biotechnology) (New CBCS)
Examination, 2017
ENVIRONMENTAL POLLUTION AND ENVIRONMENTAL POLLUTION TECHNIQUES
Paper – I : Environmental Pollution

Time : 2.30 Hours Total Marks : 70

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

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

i) The major pollution causing agent is _____
a) Animals b) Green house gases
c) Men d) UV-rays

ii) BOD stands for _____
a) Biochemical oxygen demand b) Biome of desert
c) Boron and Oxygen depletion d) Bio Oxy Depot

iii) Water pollution is caused by _____
a) CO b) PAN c) Fertilizer d) Fossil Fuel

iv) Ear muffs or cotton plugs are used to reduce pollution of _____
a) Air b) Nuclear c) Noise d) Thermal

v) June 5, is celebrated as _____
a) World Food Day b) World Science Day
c) World Environment Day d) Tree Plantation Day

vi) MIC is related with _____
a) Taj Mahal b) Aerosols
c) Bhopal Gas Tragedy d) London Smog

P.T.O.

vii) Most economic method of water conservation is _____

a) Construction of Dam b) Interlinking of rivers

c) Rain water harvesting d) Watershed Management

viii) The main cause of acid rain is _____

a) O_2 b) CO_2 c) H_2 d) SO_2

ix) The sound above _____ dB is referred as explosive sound.

a) 90 b) 110 c) 80 d) 10

x) _____ is natural source of radiation.

a) X-ray b) Nuclear reactor waste

c) Cosmic rays d) Miscellaneous

xi) Chernobyl nuclear accident took place in the early hours of _____

a) April 26, 1987 b) April 26, 1985

c) April 26, 1986 d) April 26, 1988

xii) A cleaner source of energy is _____

a) Coal b) Oil

c) Hydro power d) Natural gas

xiii) Use of natural resource is extreme in _____

a) India b) Asia c) Brazil d) United States

xiv) Sources of marine pollution are _____

a) Industrial effluents b) Oli spillage

c) Nuclear tests d) All of these

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

i) Air pollution.

ii) Global warming.

iii) Noise pollution.

iv) Thermal pollution.

v) Radioactivity.

vi) Sewage.
vii) Humification.
viii) Conventional energy.
ix) Nuclear fission.

3. A) Answer **any two** of the following : **10**
   i) Write on Green house effect.
   ii) Explain in detail on Marine pollution.
   iii) Explain fermentation of alcohol using molasses as substrate.

   B) Explain in detail Bhopal gas tragedy. **4**

4. Answer **any two** of the following : **14**
   i) Give a detailed account on effect of air pollution on human and environment.
   ii) Explain in brief soil formation process.
   iii) Explain nuclear fusion with hydrogen bomb.

5. Answer **any two** of the following : **14**
   i) Explain on Biomass energy generation method.
   ii) Write a note on local and global impact of pollution.
   iii) Explain in detail types of non conventional energies.

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SLR-CX – 17

Seat No.	

B.Sc. – I (Biotechnology) (Semester – II) (New – CBCS)
Examination, 2017
ENVIRONMENTAL POLLUTION AND ENVIRONMENTAL POLLUTION TECHNIQUES
Paper – II : Microbial Techniques

Time : 2½ Hours Max. 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 alternatives given below :

i) _____ is selective media used for cultivation of fungi.
   a) Saburaud's agar b) Blood agar
   c) Mac Conkey's agar d) Milk agar

ii) Manvel's method is used for staining of _____
   a) Cell wall b) Capsule
   c) Volutin granules d) Flagella

iii) Neutral red indicator is used in _____ medium.
   a) Nutrient agar b) Blood agar
   c) Mac Conkey's agar d) Milk agar

iv) Methylene blue is example of _____ stain.
   a) Basic b) Acidic
   c) Neutral d) None of these

v) _____ technique is used to obtain pure culture.
   a) Sterilization b) Disinfection
   c) Serial dilution d) Inoculation

vi) _____ works as solidifying agent in culture media.
   a) Sodium chloride b) Peptone
   c) Agar-agar d) Yeast extract

vii) _____ is most germicidal wavelength of U.V. rays.
a) 150 nm b) 260 nm
c) 390 nm d) None of these

viii) Hot air oven works on principle of _____ heat.
a) Dry b) Moist
c) Incineration d) None of these

ix) Denaturation of protein is done by using _____
a) Ethanol b) Phenol
c) Both of these d) None of these

x) Soil stock is used for maintenance and preservation of _____
a) Bacteria b) Yeast
c) Viruses d) Fungi

xi) The rate of cell division is increased in _____ phase of growth in bacteria.
a) Lag b) Stationary
c) Log d) Death

xii) Nutrient agar is an example of _____ media.
a) Natural b) Synthetic
c) Semisynthetic d) Living

xiii) _____ is a mordant used in Gram's staining.
a) Methylene blue b) Alcohol
c) Iodine d) Distilled water

xiv) Acid fastness of mycobacterium is due to presence of _____ in their cell wall.
a) Teichoic acid b) Mycolic acid
c) Malic acid d) Pyruvic acid

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

I) Give function of Andrade's indicator and neutral red indicator.

II) Define synchronous and diauxic growth.

III) Define and give any two examples of living media.

IV) Define dye and stain.

V) Define sterilization and disinfection.

VI) Give examples of any two chemical disinfectants and its mode of action on bacteria.

VII) Define enrichment media gives its any two examples.

VIII) Lyophilization

IX) Define autotrophs and heterotrophs.

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

i) Explain different nutritional requirements of microorganisms.

ii) Explain different phases of growth in a bacterial culture.

iii) Explain different methods used for isolation of anaerobic bacteria.

B) Explain classification of stains with example. **4**

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

i) Explain in detail about the principle, procedure and mechanism of Gram's staining.

ii) Explain nutritional classification of microorganisms on the basis of carbon and energy source.

iii) Describe in detail, principle and working of autoclave and hot air oven.

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

i) Explain different methods for isolating pure culture of bacteria.

ii) Explain different methods of preservation and maintenance of pure culture of microorganisms.

iii) Explain different media used for cultivation of microorganisms with one example of each.

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SLR-CX – 18

Seat No.	

B.Sc. – I (Biotechnology) (Semester – II) (New CBCS)
Examination, 2017
TAXONOMY AND TISSUE CULTURE
Paper – I : Taxonomy

Time : 2.30 Hours Total Marks : 70

1. Multiple choice questions. **14**

1) Pore bearing animal are included in _____
   a) Coelenterate b) Star fish
   c) Porifera d) Echinoderm

2) Polyadelphous condition is found in _____
   a) Leguminosae b) Rutaceae
   c) Compositae d) Liliaceae

3) A plant has leaves shows parallel venation _____
   a) Jawar b) Pluses
   c) Dicot d) Both a and b

4) Study of fungi is called _____
   a) Phycology b) Plant pathology
   c) Systematics d) Mycology

5) In Gymnosperm pollination occurs by _____
   a) Animals b) Wind
   c) Insects d) Water

6) Iodine is obtained from _____
   a) Ulothrix b) Ectocarpous
   c) Laminaria d) Oedogonium

P.T.O.

7) Linneaus system is gives example of _____ classification.
   a) Artificial system
   b) Numerical system
   c) Both a and b
   d) Hutichson system

8) Fungi usually share the reserve food material in the form of _____
   a) Starch
   b) Lipid
   c) Glycogen
   d) Protein

9) Out of following _____ is prokaryotic.
   a) Fungi
   b) Yeast
   c) Bacteria
   d) Viruses

10) Three chambered heart is observed in _____
   a) Pisces
   b) Amphibian
   c) Aves
   d) Mammal

11) The *Tenia solium* parasites are belong to following phylum _____
   a) Platyhelmethes
   b) Mollusca
   c) Arthropoda
   d) Echinoderma

12) Taxonomic category of any rank is nothing but _____
   a) A taxon
   b) A species
   c) A nomenclature
   d) A genus

13) Fungal cell wall contains _____
   a) Cellulose
   b) Starch
   c) Chitin
   d) Peptidoglycan

14) Cutanious respiration is an character of _____
   a) Mammals
   b) Aves
   c) Reptiles
   d) Amphibians

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

   i) Define units of classification.

   ii) Write a note on binomial nomenclature.

   iii) Write a account basidiomycets.

   iv) Explain the general characteristics of lichens.

   v) Give the economic importance of bryophytes.

   vi) What is the phonetic and phylogenetic classification ?

   vii) Write a note on Ascomycetes.

   viii) Distinguish between Reptiles and Aves.

   ix) Draw a neat and labelled diagram of Hydra.

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

      i) Give general characters of Mollusca.

      ii) Describe bacterial classification on biochemical characteristics.

      iii) Give the general characteristics of pteridophytes brief.

   B) Explain the silent features of hemichordata with proper example. **4**

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

   i) Describe in detail conventional and numerical taxonomy.

   ii) Explain in detail Bentham and Hooker's System of classification.

   iii) Give salient features of Echinodermata with example.

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

   i) Describe economic importance of fungi.

   ii) Give an account on mammals.

   iii) Describe salient features of angiosperms with example.

SLR-CX – 19

Seat No.	

B.Sc. (Semester – II) (New – CBCS) Examination, 2017
Biotechnology
TAXONOMY AND TISSUE CULTURE
Paper – II : Tissue Culture

Time : 2 ½ 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) 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) Ancourage 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

6) Microelements are essential as _____ for many biochemical reactions.
   a) Enzymes b) Catalysts c) Co-factor d) Nitrogen source

7) _____ described procedure to obtain passaged monolayer.
   a) Carrel b) Haberlandt c) Dulbecco d) Eagle

P.T.O.

8) _____ is the largest organ in human body.
   a) Intestine b) Heart c) Lungs d) Skin

9) The synthesis of cytokinin is thought to occur mainly in the _____
   a) Root tips b) Shoot tip c) Leaf tip d) Young fruit

10) Stomata were more open in plants grown in presence of higher _____ Concentration.
   a) Sodium b) Calcium c) Magnesium d) Potassium

11) After disaggregation of tissue and culturing them we get
   a) Continuous cell line b) Secondary culture
   c) Primary culture d) Clumps of cells

12) _____ of the cells represents the capability of their existence.
   a) Toxicity b) Consistency c) Vitality d) Viability

13) Ability of plant cell to form entire plant is known as
   a) Totipotency b) Pleuripotency c) Integrity d) Continuity

14) Most common measurement of viability is based on
   a) Dye exclusion assay b) Membrane Integrity
   c) Dye uptake assay d) Metabolic assay

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

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) Wrote a short note on Natural media.

7) Define organ culture.

8) Write a note on growth room in PTC.

9) Write a note on role of inverted microscope.

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) Write a note on instruments used in ATC laboratory. **4**

4. Answer the following (**any two**). **14**
   1) Explain laboratory design for animal tissue culture.
   2) Discuss the role of different constituents of serum.
   3) Explain tissue culture technique to produce novel plants.

5. Answer the following (**any two**). **14**
   1) Discuss production of haploid plants by anther culture.
   2) Discuss synthetic media for animal tissue culture.
   3) Explain in detail callus culture.

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SLR-CX – 20

Seat No.	

B.Sc. – I (Biotechnology) (Semester – II) (CBCS) New Examination, 2017
BIOCHEMISTRY AND CELL PHYSIOLOGY
Paper – I : Biochemistry

Time : 2.30 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) Glycolipids consist of _____
   a) Glycogen and glycerol
   b) Lipids and glycerol
   c) Fatty acids, carbohydrates and glycerol
   d) Fatty acids and carbohydrates

2) Fluidity of plasma membrane is maintained by_____
   a) Glycoprotein b) Phospholipid
   c) Spingolipid d) Cholesterol

3) Primary structure of proteins involves _____ type of bond.
   a) Peptide b) Hydrogen
   c) Disulfide d) Glycosidic

4) _____ purine derivative is present in nucleic acid.
   a) Cytosine b) Adenine
   c) Uracil d) Thymine

5) _____ is an example of acidic amino acids.
   a) Aspartic acid b) Glycine
   c) Lactic acid d) Alanine

P.T.O.

6) Oligosaccharides upon hydrolysis yield _____ number of monosaccharide units.
   a) 1 b) 2-10
   c) 10-100 d) 100-1000

7) Liver oils of various fishes are the richest sources of _____
   a) Retinol b) Riboflavin
   c) Thiamine d) Niacin

8) The compounds having same molecular formula but different structures are known as _____
   a) Optically active compound b) Isomers
   c) Oligomers d) Epimers

9) Insulin is made up of_____ Amino acids.
   a) 51 b) 31
   c) 20 d) 21

10) Saturated fatty acids consist of _____ bond.
   a) Carbon carbon single b) Carbon carbon double
   c) Carbon oxygen single d) Carbon hydrogen double

11) DNA stands for _____
   a) Deoxyribose nucleic acids b) Dioxyribose nucleic acids
   c) Dideoxyribose nucleic acids d) Deoxyribose nucleotides

12) _____ is example of non reducing sugar.
   a) Glucose b) Fructose
   c) Sucrose d) Ribose

13) Lipids are _____
   a) Soluble in water b) Insoluble in water
   c) Soluble in organic solvents d) Both b and c

14) m-RNA is also known as _____
   a) hn-RNA b) Soluble RNA
   c) Supernatant RNA d) Adaptor RNA

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

   i) What are nucleotides ?

   ii) Draw the structure of fluid mosaic model of membrane.

   iii) What is isomerization ?

   iv) Explain any two types of lipids.

   v) Define zwitterions.

   vi) Write a note on peptide bond.

   vii) Differentiate between DNA and RNA.

   viii) Write two deficiency disorders of retinol.

   ix) Write a note on sucrose.

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

      i) Explain Watson-Crick model of DNA.

      ii) Define and classify lipids.

      iii) Write a note on osazone formation reaction of monosaccharides.

   B) Draw the structure of glyceraldehydes, erythrose. ribose, glucose. **4**

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

   i) Define carbohydrates and write in detail classification of carbohydrates.

   ii) Explain structural levels of proteins.

   iii) Write source, requirement and deficiency disorders thiamine and riboflavin.

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

   i) Classify amino acids on the basis of polarity and draw the structure of any five amino acids.

   ii) Write a note on fluid mosaic model of plasma membrane.

   iii) Explain structure and function of t-RNA.

SLR-CX – 21

Seat No.	

B.Sc. – I (Biotechnology) (Semester – II) (CBCS) Examination, 2017
BIOCHEMISTRY AND CELL PHYSIOLOGY (New)
Paper – II : 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*** *indicate* ***full*** *marks.*

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

1) Loss of water from plants through stomata is known as _____
a) Transcription b) Translation c) Transpiration d) Translocation

2) The movement of molecule across a plant cell is _____
a) 2.5 sec. b) 1.5 sec. c) 3.2 sec. d) 1.2 sec.

3) Mycorrhiza is a symbiotic association of a fungus with _____
a) root system b) leaf system c) stem system d) all of these

4) _____ is free living nitrogen fixer.
a) Nostoc b) Rhizobium c) Rhodospirillum d) Anabaena

5) Auxins were first isolated from _____
a) Human saliva b) Human urine c) Human sperm d) Human DNA

6) _____ is known as master endocrine gland in the human body.
a) Thyroid b) Thymus c) Pancreas d) Pituitary

7) Renal corpuscle in human kidney meant for _____
a) Secretion b) Absorption c) Draining d) Filtration

8) _____ cells are responsible for secretion of estrogen.
a) Leydig b) Serous c) Follicular d) Goblet

9) _____ is known as shoot inducing hormone.
a) Auxin b) Cytokinin c) ABA d) Ethylene

10) The dental formula for human teeth is _____
a) 2123 b) 2213 c) 2231 d) 2312

11) The life span of RBC is _____ days.
a) 120 b) 100 c) 110 d) 130

12) Deficiency of _____ in our diet causes Goitre.
a) Copper b) Zinc c) Boron d) Iodine

P.T.O.

13) _____ is a critically essential element.
a) Nitrogen b) Phosphorous c) Potassium d) All of these

14) _____ is a micronutrient.
a) Copper b) Zinc c) Boron d) All of these

2. Answer the following (**any 7**) : **14**
i) Define water potential.
ii) What is osmosis ?
iii) What is Hydroponics ?
iv) Write a note on Apical dominance.
v) Draw neat labeled diagram of reflex arc.
vi) What is chyme ?
vii) Write a note on Goblet cells.
viii) What is open circulatory system ?
ix) Write a note on blood plasma.

3. A) Answer **any two** of the following : **10**
i) Describe human digestive system with neat labeled diagram.
ii) Explain structure, synthesis and functions of ABA and Gibberellins.
iii) Describe human respiratory system with neat labeled diagram.

B) Describe types, phases and factors affecting seed dormancy. **4**

4. Answer **any two** of the following : **14**
i) Explain different types of transpiration.
ii) Describe human nervous system.
iii) Describe mechanism of urine formation with neat labeled diagram.

5. Answer **any two** of the following : **14**
i) Explain examples of micronutrients with its role in plant development.
ii) Describe structure of human heart with neat labeled diagram.
iii) Explain the structure and function of neuron.

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SLR-CX – 22

Seat No.	

B.Sc. – I (Biotechnology) (Semester – II) (CBCS) (New)
Examination, 2017
BIOMETRY AND COMPUTER SCIENCE
Paper – I : Biometry

Time : 2.30 Hours Total Marks : 70

Instructions : *1) **All** questions are **compulsory**.*
*2) Figures to **right** indicate **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) The solution of the equation $3x^2 + 6 = 0$ is _____

a) An imaginary number b) An integer
c) A rational number d) An irrational number

2) The conjugate of the complex number $4 - 3i$ is _____

a) $4i + 3$ b) $3i - 4$
c) $3i + 4$ d) $-3 - 4i$

3) If A = {5, 7, 8, 4} and B = {5, 2, 3, 4} then B – A = _____

a) {7, 8} b) {2, 3}
c) { } d) {0, –5}

4) A function f is said to be an odd function if

a) f (x) = f (–x) b) f (–x) = – f (x)
c) f (x) = $3x^2$ d) f (x) = 3^x

P.T.O.

5) $\lim_{x\to 0}\left(x+\frac{\sin x}{x}\right)=$ _____

a) 0 b) 1
c) 2 d) – 1

6) $f(x)=\frac{6}{x-2}$ is discontinuous at x = _____

a) 0 b) – 2
c) 2 d) 6

7) If f(x) = – 5 cos x, then f' (0) is _____

a) 1 b) 5
c) 0 d) – 5

8) A function f is decreasing at a, if

a) $f'(a) > 0$ b) $f(a) > 0$
c) $f(a) < 0$ d) $f'(a) < 0$

9) If $\int f(x)dx = f(x)$ then

a) f(x) = c b) f'(x) = f (x)
c) f(x) = 1 d) f'(x) = x

10) $\int_1^2 9x^2dx =$ _____

a) 21 b) 7
c) 9 d) 71

11) If f (x,y) = 3 x then $\frac{\partial f}{\partial x} =$ _____

a) 3 b) 3y
c) 3xy d) 0

12) Degree of the differential equation $\left(\frac{d^2y}{dx^2}\right)^2+7\left(\frac{dy}{dx}\right)^3=50$ is

a) 3 b) 2
c) 7 d) 4

13) If A is Matrix of order 2 × 3, BA is matrix of order 3 × 3, then order of B is _____

a) 3 × 2 b) 2 × 3
c) 2 × 2 d) 3 × 3

14) $D = \begin{pmatrix} 6 & 0 & 0 \\ 0 & 6 & 0 \\ 0 & 0 & 6 \end{pmatrix}$ is _____

a) Scalar Matrix b) Rectangular Matrix
c) Identity Matrix d) Skew-symmetric Matrix

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

1) Find the value of $2i^{14} + i^{15} - 3i^{16} - i^{17}$.

2) If C = {6, –5} then find power set P (C) of C.

3) If f(x) = 3x – 1 and g(x) = 2x then find f o g.

4) If $\lim_{x \to a} \frac{x^5 - a^5}{x - a} = 80$, find a.

5) If f(x) = $\begin{cases} 5 + 3x & \text{for } x \neq 2 \\ 11 & \text{for } x = 2 \end{cases}$, then examine the continuity of function at x= 2.

6) If $y = 7x^2\, 3^x$, then find $\frac{dy}{dx}$.

7) Evaluate $\int 3\sec^2 x - 4\operatorname{cosec}^2 x\, dx$.

8) Evaluate $\int_0^1 e^x\, dx$.

9) Solve differential equation $y + x\frac{dy}{dx} = 0$.

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

1) Evaluate $\lim_{x \to 2} \frac{2x^2 + 3x - 14}{x^2 + 3x - 10}$.

2) Differentiate $\frac{\sec x}{5 + 4x}$ with respect to x.

3) Evaluate $\int x^2 \sin x\, dx$.

B) Solve the following : **4**

If $A = \begin{bmatrix} 4 & 3 & 1 \\ -1 & 2 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 5 \\ -2 & 4 \\ 0 & -7 \end{bmatrix}$ then find AB.

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

1) If $z_1 = 3 + i$, $z_2 = 2 - 3i$, $z_3 = i$ and $z_4 = 7 - 6i$ than find $\frac{z_1 + z_2}{z_4 + z_3}$.

2) If X = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, A = { 3, 4, 5, 6, 7}, B = {1, 2, 5, 6}, C = {6, 7, 8, 9} then verify $A' \cap (B \cup C) = (A' \cap B) \cup (A' \cap C)$.

3) Find the maximum and minimum value of the function $f(x) = 2x^3 - 15x^2 + 36 - 1$.

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

1) Draw the graph of linear function $y = f(x) = 2x + 4$.

2) If $f(x) = \begin{cases} \frac{\tan 3x}{x} + a & \text{for } x > 0 \\ x + 5 + b & \text{for } x < 0 \\ 1 & \text{for } x = 0 \end{cases}$ is continuous at x = 0 then find a,b.

3) Solve the equations x + y + z =1, 2x + 3y +2z = 2, x + y + 2z = 4 using reduction method or Gaussian Elimination method of matrix.

SLR-CX – 23

Seat No.	

B.Sc. – I (Semester – II) (Biotechnology) (New) (CBCS Pattern)
Examination, 2017
BIOMETRY AND COMPUTER SCIENCE (Paper – II)
Computer Science

Time : 2½ Hours Max. Marks : 70

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

1. Choose the correct alternative from the following and rewrite the sentence. **14**

1) _____ is a default file name of excel.
a) Book1 b) Document1 c) Presentation1 d) Table1

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

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

4) To save 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

6) The software which must be loaded before the application software is
a) Utility Software b) A programming language
c) Operating system d) None

7) The memory which can be read and write data is
a) RAM b) ROM c) Both a) and b) d) None

8) To open a new document in word, _____ menu is opened.
a) File b) Edit c) Insert d) Format

9) In excel, a workbook contains _____ worksheets.
a) 255 b) 256 c) 3 d) 1

10) A diamond box is used to indicate _____ in flowcharts.
a) Input b) Output c) Decision d) None

P.T.O.

11) _____ is a pictorial representation of logic of a program.
a) Flow chart b) Chart c) Pseudo code d) Picture code

12) _____ is a widely used search engine.
a) Bing b) Google c) Khoj d) Hit counter

13) _____ bits mean 1 byte.
a) 4 b) 8 c) 16 d) 32

14) _____ device accepts data and instructions from the user.
a) Output b) Input c) Storage d) Control

2. Answer **any seven** of the following : **14**
i) Explain any two methods to calculate average in Excel.
ii) Explain features of Networking system.
iii) Enlist any four output devices.
iv) Explain need of database.
v) Define the following terms :
1) Software 2) Computer.
vi) Explain cut and paste operations in word.
vii) Explain Local Area Network.
viii) Explain the advantages of flow chart.
ix) Draw the different symbols of flow chart.

3. A) Write a note on **any two** of the following : **10**
i) What is Computer ? Explain the different units of Computer.
ii) Define Algorithm and Flow chart. Explain the principles of algorithm.
iii) Explain characteristics of operating system.

B) Write a note on Windows operating system. **4**

4. Answer **any two** of the following : **14**
i) What is Network ? Explain its types.
ii) Explain history of computers.
iii) Explain use of basic programming in Biology.

5. Answer **any two** of the following : **14**
i) What is Network Topology ? Explain its types with diagram.
ii) What is Computer ? Explain the parts of Computer.
iii) Define Algorithm and Flow chart. Explain the properties of algorithm.

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SLR-CX – 24

Seat No.	

B.Sc. (Part – I) (Semester – II) (Biotechnology) Examination, 2017
ENGLISH (Compulsory) (CGPA Pattern) (Old)
On Track English Skills for Success

Time : 2½ Hours Max. Marks : 70

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

1. Rewrite the following sentences choosing correct alternatives given below them. **14**

1) Vivekananda reached Chicago in the month of
   a) September b) February c) December d) July

2) J. H. Wright was
   a) A Professor at Harvard University
   b) A Professor at Oxford University
   c) A Professor at Cambridge University
   d) None of the above

3) _____ represented the Buddhists of Ceylon at Parliament of Religion in Chicago.
   a) Annie Besant b) Protap Chunder Mozoomdar
   c) Chakravarti d) Dharmapala

4) According to Palkhivala, violations of economic needs occur from
   a) Draught b) Natural disaster
   c) Ignorance d) Negligence

5) _____ noted that there are more than two hundred definitions of liberty.
   a) Paul Sieghart b) Jerome Shestack
   c) Isaiah Berlin d) None of the above

6) _____ missile devastated London in World War II.
   a) V2 b) Jupiter c) Agni d) None of the above

7) Wernher von Braun became a cult figure in
   a) America b) Germany c) France d) Russia

P.T.O.

8) The poem 'Full Moon' is written by
   a) Robert Hayden b) W. B. Yeats
   c) Sarojini Naidu d) Ralph Waldo Emerson
9) The phrase 'bubble house' refers to
   a) The sun b) The moon c) Mars d) Earth
10) In the poem Brahma, 'red slayer' refers to
   a) Member of military in the Kshatriya caste system
   b) A member of army of maharaja
   c) A member of ministry of state
   d) None of the above
11) Abhishek is talking about _____ own brother.
   a) its b) her c) his d) it
12) The words 'clockwise and anti-clockwise' are
   a) Antonyms b) Synonyms
   c) Homophones d) Homographs
13) The words 'meat and meet' are
   a) Homophones b) Homographs
   c) Homonyms d) Antonyms
14) He thinks his car is as _____ as yours.
   a) Fast b) Faster
   c) Fastest d) None of the above

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

1) In Paul Sieghart's opinion, which society can be called civilized ?
2) What is the effect of broadbanding of human rights ?
3) What is the 'vanishing act' Palkhivala writes about ?
4) What did Vivekananda discover at Information Bureau of the Exposition ?
5) Describe Vivekananda's journey from Mumbai to Chicago.
6) What did Maharaja of Khetri give Vivekananda ?
7) What advice did Wernher von Braun give to Dr. Kalam ?
8) What does Dr. Kalam mean by 'flow' ?

3. A) Answer **any two** of the following questions : **8**
   1) What is the message of the poem 'Brahma' ?
   2) Is the moon depicted as a challenge or a threat or a comfort in the poem ?
   3) Who were 'watchers of the moon' ? What happened to them ?

   B) Answer **any two** of the following questions : **6**
   1) Your college is organising an essay competition. Write a notice informing the students about the competition, giving details such as day, date, time and venue of the competition.
   2) What is an agenda ?
   3) What is email ?

4. Answer **any one** of the following : **14**
   A) You are secretary of the Students Union in your college. The Students Union is organising a blood donation camp in the college. Write a notice and agenda of the meeting. Imagine all the details.
   B) You have got an email letter offering job of probationary officer in a nationalised bank. Write an email letter accepting the offer.

5. Prepare a suitable C.V. for the post of the lecturer in English in a junior college in your city. **14**

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SLR-CX – 25

Seat No.	

B.Sc. – I (Semester – II) (Old-CGPA) Examination, 2017
BIOTECHNOLOGY
Environmental Pollution and Microbial Techniques

Time : 3 Hours | Total Marks : 70

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

PAPER – I
(Environmental Pollution)

1. Multiple choice questions : **5**

1) _____ is a non renewable energy resource.
   a) Solar energy b) Thermal energy
   c) Geothermal energy d) Nuclear energy

2) The process that convert solid coal into liquid hydrocarbon fuel is called _____
   a) Liquefaction b) Catalytic conversion
   c) Cracking d) Carbonation

3) The primary air pollutant responsible for acid rain is _____
   a) CO b) CO_2
   c) SO_2 d) CH_4

4) _____ is a biodegradable organic substance.
   a) Oil b) Plastic
   c) Pesticide d) Garbage

5) Minamata disease was occurred in _____
   a) India b) Japan
   c) Italy d) Ukraine

P.T.O.

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

1) Write down sources of air pollution.

2) What is BOD ?

3) Explain effects of air pollution.

4) What is gasification ?

5) Write down units of radiation measurement.

6) What is acid rain ?

7) What is OTEC ?

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

1) Enlist sources of water pollution and explain in detail eutrophication.

2) Write down effects of chemical fertilizer and pesticide on soil.

3) Write down case study of Bhopal gas tragedy.

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

1) What is air pollution ? Explain effects of air pollution on plants and animals.

2) What is radioactivity ? Write down in detail nuclear energy generation process.

PAPER – II

(Microbial Techniques)

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

1) Hot air oven is working on _____ principle.

a) Moist Heat b) Dry heat
c) Radiation d) Desiccation

2) _____ method is used for volutin granule staining.

a) Giemsa's b) Gram's
c) Manvels d) Alberts

3) Eosin is an example of _____ stain.

a) Basic b) Acidic
c) Neutral d) None of these

4) Rosenthal method is used for culturing _____

a) Aerobes b) Anaerobes
c) Both of these d) None of these

5) To adjust osmotic pressure _____ component is added to culture media.

a) Nacl (sodium chloride) b) Agar-agar
c) Vitamine d) Yeast extract

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

i) In which medium it is used and give its function sodium taurocholate.

ii) Define differential media and give its examples.

iii) Define synchronous growth.

iv) Define lyophilisation and give its use.

v) Define Dye and Stain. Give its example.

vi) Give names of laboratory methods used for determination of growth.

vii) Give types of radiations used for sterilization.

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

i) Mechanism of Gram's staining.

ii) Growth phases in bacterial culture.

iii) Principle, working and mechanism of Autoclave.

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

i) Write an account on common components used in media formulation and its function.

ii) Write an account on different methods used for isolating pure culture of bacteria.

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SLR-CX – 26

Seat No.	

B.Sc. – I (Biotechnology) (Semester – II) (Old) (CGPA) Examination, 2017
BIOCHEMISTRY AND CELL PHYSIOLOGY

Time : 2.30 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) _____ of the following is an unsaturated fatty acid.
   a) Palmitate b) Stearate
   c) Choline d) Oleate

2) Nonsense codons are present on _____
   a) mRNA b) tRNA
   c) rRNA d) None of these

3) The human species can biosynthesize _____
   a) Vitamin C b) Vitamin D
   c) Thiamine d) Niacin

4) The sulphur containing amino acid is _____
   a) Valine b) Leucine
   c) Methionine d) Aspargine

5) The general formula for monosaccharide's _____
   a) $C_nH_{2n}O_n$ b) $C_{2n}H_2O_n$
   c) $C_nH_nO_{2n}$ d) $C_nH_{2n}O_{2n}$

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

i) Give an account on function of nucleic acid.

ii) Explain the physiological role of Vitamin C.

iii) Enlist the bonds involved in stabilization of structure of protein.

iv) What are lipids ? Write physical properties of lipids.

v) Write a note on peptide hormones.

vi) Give the classification of vitamins.

vii) What is mutarotation ?

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

i) Write a note on polysaccharides.

ii) Classify proteins based on their molecular shape.

iii) Explain source, physiological role and deficiency disorders of vitamin B12.

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

i) Explain types and structure of RNA. Add a note on biological role of nucleic acid.

ii) Give the classification and function of amino acids. Add a note on biological role of proteins.

PAPER – II
(Cell Physiology)

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

1) _____ is fruit ripening hormone.

a) Auxin b) Cytokinin

c) ABA d) Ethylene

2) _____ is structural and functional unit of muscle contraction and relaxation.

a) Neuron b) Reflex arc

c) Nephron d) Sarcomere

3) _____ is responsible for induction of auricular systole.

a) Sinoatrial node
b) Atrio-ventricular node
c) Bundle of His
d) Purkinje fibres

4) _____ is responsible for constriction of blood vessels.

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

5) _____ is endocrine as well as exocrine gland.

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

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

i) What is stomatal transpiration ?
ii) What is Photorespiration ?
iii) Write a note on conducting system of heart ?
iv) Draw neat labeled diagram of Kranz anatomy.
v) What is reflex action ?
vi) Write a note on vernalisation.
vii) What is apoplast pathway ?

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

i) Explain various mechanisms of absorption of elements.
ii) Explain the structure and function of human nervous system.
iii) Describe human digestive system with neat labeled diagram.

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

i) Explain structure, synthesis and functions of Gibberellins and ABA.
ii) Describe human excretory system and add note on mechanism of urine formation.

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SLR-CX – 27

Seat No.	

B.Sc. – I (Biotechnology) (Semester – II) (Old CGPA) Examination, 2017
BIOMETRY AND TISSUE CULTURE

Time : 2.30 Hours | Total Marks : 70

Instructions : *1)* ***All*** *questions are* ***compulsory****.*
2) Draw ***neat*** *and* ***labeled*** *diagrams* ***wherever*** *necessary.*
3) Figures to ***right*** *indicate* ***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 $3y - 5 = 11$ is _____
   a) A whole number b) An integer
   c) A rational number d) An irrational number

2) The modulus of the complex number $3 - 4i$ is _____
   a) $3 + 4i$ b) 5
   c) 7 d) -5

3) If n(Q)= 4 then n[P(Q)] = _____
   a) 8 b) 16
   c) 2 d) 4

4) If $y = 5 \log x$, then $y'(2)$ is _____
   a) 5 b) 2.5
   c) 2 d) 25

5) If B is a skew symmetric matrix, then
   a) $B = I$ b) $B = B^T$
   c) $B = -B^T$ d) $B = -I$

P.T.O.

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

i) Describe the relation between the set of natural numbers, set of rational numbers and set of real numbers using Venn diagram.

ii) Find the $z+\bar{z}$ and $z-\bar{z}$ for $z = 3 - 5i$.

iii) If A = {3, 2, 6, 5, 7} and B = {4, 6, 3, 1} then find A – B and B – A.

iv) If $\lim_{x\to 0} \frac{\sin 8x}{\tan ax} = 2$, find a.

v) If $f(x) = 9(5^x x^7)$, then find f'(x).

vi) Evaluate the integral $\int (4x - 3\sec^2 x)\, dx$.

vii) If $S = \begin{bmatrix} 2-x & 5 \\ 3 & 7 \end{bmatrix}$ is singular matrix, then find x.

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

i) If $z_1 = 1 - 2i$ and $z_2 = 3 + 3i$, then find the values of $z_1^{\,2} + z_2^{\,2}$ and $z_1 . z_2^{\,2}$

ii) If $f(x) = 5x - 1$ and $g(x) = 2x^2 + 1$, then find f o g and g o f.

iii) Evaluate $\lim_{x\to 3} \frac{2x^2 - 3x - 9}{5x^2 - 16x + 3}$.

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

i) Find the maximum and minimum value of the function
$f(x) = x^3 - 3x^2 - 9x + 21$

ii) If $A = \begin{bmatrix} 7 & -2 & 1 \\ 3 & -1 & -2 \\ -6 & 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 2 & 2 \\ 0 & 1 & 0 \end{bmatrix}$ 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) Cobalt and Nickel inhibit _____ synthesis.
      a) Ethylene b) Gibberellin c) Cytokinin d) Auxin

   2) Microelements are essential as _____ for many biochemical reactions.
      a) Enzymes b) Catalysts c) Co-factor d) Nitrogen source

   3) _____ described procedure to obtain passaged monolayer.
      a) Carrel b) Haberlandt c) Dulbecco d) Eagle

   4) Most important protein required for growth of animal cell is _____
      a) Karetin b) Transferrin 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 green house.
   2) Describe in brief culture vessel in PTC.
   3) Write a note on plant growth hormones.
   4) Define totipotency.
   5) Explain in brief laminar air flow.
   6) Write a short note on micropipettes.
   7) Define primary cell line.

3. A) Answer the following **(Any two)** : **10**
      1) Discuss tissue culture technique to produce novel plants.
      2) Explain in detail suspension culture.
      3) Give details of pollen culture

   B) Answer the following **(Any one)** : **10**
      1) Describe laboratory design for animal tissue culture.
      2) Discuss the role of different constituents of serum.

SLR-CX – 28

Seat No.	

B.Sc. – I (Semester – II) (Biotechnology) (Old CGPA) Examination, 2017
TAXONOMY AND COMPUTER SCIENCE

Time : 2.30 Hours | Total Marks : 70

Note. : *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) The Bacteria which can pass through bacteria proof filter are called as _____

a) Actinomycetes b) Archaebacteria
c) Mycoplasma d) Chlamydia

2) _____ are the symbiotic association between algae and fungi.

a) Archaebacteria b) Lichens
c) Mycoplasma d) Actinomycetes

3) The root which develops from any portion of the plant except radical is known as _____

a) Tap root b) Stilt root
c) Fibrous root d) Adventitious roots

4) _____ are the respiratory organs in fishes.

a) Lungs b) Skin
c) Trachea d) Gills

5) _____ are soft bodied animals.

a) Aves b) Echinodermata
c) Mammals d) Mollusca

P.T.O.

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

i) Numerical taxonomy.

ii) Enlist Aims of Taxonomy.

iii) Features of Hemichordata.

iv) Morphological characters of Fungi.

v) Gymnosperms.

vi) Write a note on Aves.

vii) Lichens.

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

i) Give an account on Rickettsia.

ii) Explain Archaebacteria.

iii) General characters of Pteridophytes.

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

i) Give an account on G.M. Smith Classification for Bryophytes.

ii) Give general features of Fishes.

PAPER – II
(Computer Science)

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

1) _____ is a most widely used search engine.

a) Google b) Bing

c) Khoj d) Hit counter

2) 1 byte is equal to _____ bits.

a) 4 b) 8

c) 32 d) 64

3) For database management system _____ package is used.

a) MS Word b) MS Excel

c) MS PowerPoint d) MS Access

4) _____ is a step by step instructions which are written for solving a problem.
   a) Algorithm
   b) Flow chart
   c) Picture chart
   d) Picture code

5) To copy, the shortcut key is _____
   a) Ctrl + X
   b) Ctrl + P
   c) Ctrl + V
   d) Ctrl + C

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

   i) Explain application software with example.

   ii) Explain how you will change font and font style in word.

   iii) Enlist any four output devices.

   iv) Explain memory unit.

   v) Define the following terms :
      1) Computer
      2) Operating system

   vi) Explain features of networking.

   vii) Explain Local Area Network.

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

      i) Explain the features of internet.

      ii) Explain how will you prepare chart in excel.

      iii) Explain Modem.

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

      i) What is Computer ? Explain types of computer.

      ii) Explain intranet and extranet.

_____

SLR-CX – 29

Seat No.	

B.Sc. – II (Biotechnology) (Semester – III) (CGPA) Examination, 2017
INHERITANCE BIOLOGY

Time : 2.30 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) 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) The XX-XO system of sex determination system found in _____
   a) Ant b) Birds
   c) Honey bee d) Grasshoppers

3) Petite mutants were first discovered _____ in the yeast.
   a) E. Tatum b) B. Ephrussi
   c) McClung d) T.H. Morgan

4) _____ is a recessive trait.
   a) Round seeds b) Purple flowers
   c) Yellow pods d) Inflated pods

5) _____ males are heterogametic.
   a) Human b) Honey bee
   c) Sparrow d) Birds

6) ABO blood grouping is an example of
   a) Dominance
   b) Multiple alleles
   c) Incomplete dominance
   d) Complementation

7) 'F' plasmids are actively involved in _____ process.
   a) Transformation
   b) Conjugation
   c) Transduction
   d) All of these

8) In _____ blood clots to fail or clotting process appears very slowly.
   a) Hemophilia
   b) Color blindness
   c) Hypertrichosis
   d) Night blindness

9) In co-dominance phenotypic and genotypic ratio is _____
   a) 9:3:3:1
   b) 1:1:1:1
   c) 9:3:4
   d) 1:2:1

10) _____ discovered the process of conjugation in bacteria.
   a) A. Hershey and M. Chase
   b) J. Lederberg and E. Tatum
   c) J. Lederberg and N. Zinder
   d) Avery, MacLeod and McCarthy

11) _____ studied the inheritance of leaf variegation in the *Mirabilis jalapa*.
   a) McClung
   b) T.H. Morgan
   c) B. Ephrussi
   d) Carl Correns

12) In _____ the typical Mendelian dihybrid ratio is changed to 9:4:3.
   a) Complementary gene action
   b) Supplementary gene action
   c) Inhibitory gene action
   d) None of these

13) Genes located on the mitochondrial DNA categorized as _____
   a) Nuclear genes
   b) Plasma genes
   c) Silent genes
   d) None of these

14) Competency can be induced in *E.Coli* cells by treating them with _____
   a) $HgCl_2$
   b) $FeCl_2$
   c) $CaCl_2$
   d) $NaCl_2$

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

   i) What are multiple alleles ?

   ii) Give types of linkage.

   iii) What is complementation test ?

   iv) Write note on types of chromosomes.

   v) Define prophage.

   vi) Write a note on 'F' Factor.

   vii) What is Y liked genes ?

   viii) Write a note on Hemophilia.

   ix) Write a note on complementary genes.

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

      i) Explain X linked inheritance with any two suitable examples.

      ii) Describe genetic system in mitochondria.

      iii) Describe mechanism of crossing over with neat labeled diagram.

   B) Describe law of segregation with suitable example. **4**

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

   i) Write in detail process of generalized transduction in bacteria.

   ii) Explain concept of maternal inheritance with any two suitable examples.

   iii) Explain inhibitory and supplementary gene action.

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

   i) Explain structure of X and Y chemosome in humans.

   ii) Describe transformation in bacteria with neat labeled diagram.

   iii) Describe in detail any two methods of gene mapping.

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SLR-CX – 30

Seat No.	

B.Sc. – II (Biotechnology) (Semester – III) CGPA Examination, 2017
CYTO-GENETICS AND POPULATION GENETICS

Time : 2.30 Hours | Total Marks : 70

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

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

1) Chromosome movement during cell division is brought by _____
   a) Centrosome b) Centromeres
   c) Chromomere d) Chromosome

2) Number of Barr bodies present in nucleus of female XX chromosome is _____
   a) 2 b) 1
   c) 3 d) 0

3) Trisomy of chromosome 13 result in _____
   a) Down's syndrome b) Edwards syndrome
   c) Patau syndrome d) Klinefelters syndrome

4) In meiosis synapsis between the homologous chromosomes occurs during _____ stage.
   a) Zygotene b) Leptotene
   c) Pachytene d) Diplotene

5) Division of cytoplasm is called _____
   a) Cytokinesis b) Karyokinesis
   c) Mitosis d) Meiosis

6) Gametic meiosis occurs at the time of gamete formation in _____
   a) Animals and man
   b) Fungi and algae
   c) Some algae
   d) Some fungi

7) The ratio of one allele to the other allele in a gene pool or a population is called _____
   a) Gene frequency
   b) Gene flow
   c) Immigration
   d) Mutation

8) The size of inverted terminal repeats in complex transposons is _____
   a) 48 nucleotide pair
   b) 38 Nucleotide pair
   c) 58 Nucleotide pair
   d) 28 Nucleotide pair

9) The largest value is 195 and smallest value is 90 the range of the number is _____
   a) 100 b) 70 c) 105 d) 175

10) Microsatellite was discovered by _____
   a) Litt and Lutty
   b) Boveri and Sutton
   c) Morgan and Lavan
   d) Tjio and Lavan

11) Radocabbage is an example of _____
   a) Autopolyploid
   b) Allopolyploid
   c) Polyploid
   d) Aneuploid

12) Cytologist who established the presence of 46 chromosome in humans is _____
   a) J.H. Tjio and A .Lavan
   b) C.E. Ford and J.L. Hammerton
   c) S. Makino and M.S. Sasakl
   d) J.D. Watson and F.H. Crick

13) The enzyme responsible for transposition is _____
   a) Resolvase
   b) Polymerase
   c) Transposase
   d) Invertase

14) The fluctuation in gene frequency is called _____
   a) Gene pool
   b) Allele frequency
   c) Genetic Drift
   d) Random Drift

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

   1) What is the Heterochromatin ?

   2) Define Karyotype.

   3) Define Migration.

   4) Define Inversion.

   5) Define Position effect.

   6) Define Non-disjunction.

   7) Define Transposition.

   8) Define Autosomes.

   9) What are Holandric genes ?

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

      1) Describe the structure of polytene chromosome with a neat labelled diagram.

      2) Describe the normal human Karyotype according to Denver classification.

      3) "Heterochromatin is genetically inactive" justify the statement with example.

   B) Explain the process of mitosis and add a note on its significance. **4**

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

   1) Write in detail about numerical changes in chromosomes with neat diagram.

   2) Describe multiple factor hypothesis with suitable example.

   3) Describe the genetic basis of evolution in Brassica and wheat.

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

   1) Write in detail about Hardy-Weinberg law and its application.

   2) Write in detail about different types of bacterial transposons with neat diagram.

   3) Write a note on effect of environment on quantitative traits.

SLR-CX – 31

Seat No.	

B.Sc. (Biotechnology) (Part – II) (Semester – III) Examination, 2017
BIOPHYSICAL INSTRUMENTS (CGPA)

Time : 2.30 Hours Total Marks : 70

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

1. Rewrite the sentence using **correct** alternative given below. **14**

1) In UV Visible spectroscopy, the _____ filament lamp is generally used as a source for generation of visible radiations.
   A) Xenon B) Tungsten
   C) Deuterium D) Hydrogen

2) In electromagnetic wave, the oscillations are _____ to the direction of propagation of wave and energy.
   A) Right angles B) Left angles
   C) Parallel D) Perpendicular

3) The degree of attenuation of a radiant beam incident on particles suspended in a medium can be measured by _____
   A) Turbidometry B) AAS C) Nephlometry D) XRD

4) In atomic absorption spectroscopy, the elements are detected by absorption of radiation by free atoms in _____ state.
   A) Liquid B) Gas C) Solid D) Inert

5) The pH meter measures the potential difference between pH glass electrode and a _____ reference electrode.
   A) Zinc B) Cadmium
   C) Cobalt D) Calomel

P.T.O.

6) In centrifugation, for rotation of an object around the fixed central axis, a strong force _____ to the axis of spin has to be applied.

A) Equatorial
B) Parallel
C) Perpendicular
D) Longitudinal

7) Isopycnic centrifugation is a technique used to separate molecules on the basis of their _____

A) Surface tension
B) Conductivity
C) Redox potential
D) Buoyant density

8) The pH indicator phenolphthalein shows the color change from colorless to pink, as the pH of the solution _____

A) Increases
B) Decreases
C) Remains constant
D) Suddenly changes

9) Phase contrast microscopy can show the differences in _____ as difference in contrast.

A) Darkness
B) Brightness
C) Numerical aperture
D) Refractive index

10) In _____ microscope, the light source and condenser are situated on the top above the stage, pointing downwards.

A) Compound
B) Inverted
C) Dark field
D) Phase contrast

11) The radiation energy absorbed per unit mass is known as the _____ dose.

A) Effective
B) Equivalent
C) Absorbed
D) Measured

12) In circular dichorism, the differential absorption of _____ light is analyzed.

A) Polarized
B) Reflected
C) Inhibited
D) Deviated

13) Pulses of light generated due to ionization of a material by incident radiation are detected in _____

A) X ray diffraction
B) Flow cytometry
C) GM counter
D) Scintillation counter

14) In _____ technique, the cells are suspended in a stream of fluid and passed through electronic detection apparatus for detection.

A) Nephlometry
B) Flow cytometry
C) NMR
D) AAS

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

1) What is rate zonal centrifugation ?
2) State any two hazardous biological effects of radiations.
3) Write the principle of electron microscopy.
4) Draw a neat labeled diagram of pH meter.
5) State Beer and Lamberts law.
6) State different wavelength ranges of an electromagnetic spectrum.
7) State names of radioactivity detection techniques.
8) How the optical rotatory dispersion technique can be used for molecular characterization ?
9) Differentiate between dark field and bright field microscopy.

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

1) Describe the errors in pH measurement.
2) Write a note on rotors used for centrifugation.
3) Write a note on dosimeter.

B) Write a note on 'nature of radioactivity'. **4**

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

   1) Describe the construction, working and applications of UV Visible spectroscopy.

   2) Illustrate the principle, working and applications of X-ray diffraction.

   3) Write an account on 'electron microscopy'.

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

   1) Write a note on electromagnetic spectrum and describe molecular energy levels.

   2) Describe the applications of radioisotopes. What are safety measures for their handling ?

   3) Illustrate the principle, working and applications of flow cytometry.

SLR-CX – 32

Seat No.	

B.Sc. – II (Biotechnology) (Semester – III) (CGPA) Examination, 2017
ANALYTICAL TECHNIQUES

Time : 2.30 Hours | Total 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) B mercapto ethanol reduces _____ in protein structure.
   a) Hydrogen bonding b) Carboxyl group
   c) Methyl group d) Disulphide linkage

2) Purpose of using stacking gel is to _____ proteins.
   a) Distribute b) Separate
   c) Concentrates d) Analyse

3) In which technique P^H gradient in gel is used for separation ?
   a) PAGE b) IEF
   c) SDS-PAGE d) Sedimentation

4) In biological term _____ occurs at the barrier between blood and filtrate in renal capsule.
   a) Ultrafiltration b) Centrifugation
   c) Macrofiltration d) Paper Filtration

5) _____ constructed first working dialyzer in 1943.
   a) Dr. Nakamurab b) Dr. Watson
   c) Dr. Ronald Ross d) Dr. Willem Kolff

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

P.T.O.

7) Which of the following is the most suitable gas to use as a carrier gas in GLC ?

a) Methane b) Helium

c) Carbon dioxide d) Oxygen

8) _____ Chromatography method is especially used for separation of 4s and 5s tRNA.

a) Molecular sieve b) Affinity

c) Ion exchange d) Paper

9) Partition coefficients are inversely proportional to _____ of analyte in GLC.

a) Type b) Concentration

c) No. of side chains d) Volatility

10) _____ is extensively used chromatographic technique to determine base composition of nucleic acid.

a) GLC b) Adsorption

c) Ion exchange d) Affinity

11) _____ proteins are underrepresented during 2-D gel electrophoresis.

a) DNA b) Membrane

c) Cellular d) Organelle

12) In 1994 _____ threw the term proteome in scientific community.

a) Marc Wilkins b) Jimmy Anderson

c) Morris Rudolf d) Rutherford

13) BCA stands for _____

a) Bromide Carrier Assay b) Bergmans Centrifugation Assay

c) Baltimores Citrates Assay d) Bicinchoninic Acid Assay

14) _____and_____invented 2-D gel electrophoresis independently in 1975.

a) Darvin and Klose b) Klose and Muller

c) O' Farrel and Klose d) O' Farrel and Muller

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

   1) Separating gel in SDS-PAGE.

   2) Sample application in GLC.

   3) Write a note on cell disruption in homogenizer.

   4) Explain principle of Bradford assay.

   5) How buffer affect eletrophoretic mobility ?

   6) Write a note on protein interaction mapping.

   7) Write the advantages and limitations of lowry assay.

   8) Write a note on blotting.

   9) Brief account on introduction of proteomics.

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

      1) Write a note on ascending paper chromatography.

      2) Explain ammonium sulphate precipitation of proteins.

      3) Write a note on Dialysis.

   B) Discuss limitations of 2-D gel electrophoresis. **4**

4. Answer the following (**any two**) : **14**

   1) Explain electrophoretic technique for protein which uses P^H gradient for separation.

   2) Discuss protein Blotting.

   3) Describe Edman degradation for protein sequening.

5. Answer the following **(any two)** : **14**

   1) Discuss ion exchange chromatography.

   2) Explain in detail Autoradiography.

   3) Give details of BCA assay.

SLR-CX – 33

Seat No.	

B.Sc. – II (Semester – III) (Biotechnology) (CGPA) Examination, 2017
IMMUNOLOGY – I

Time : 2.30 Hours | Total Marks : 70

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

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

i) Vaginal secretion contains _____, which is degraded by Lactobacillus and converted into lactic acid, hence creates unfavorable environment for the growth of microbes.
   a) Uric acid b) Glycogen
   c) Lactoferrin d) Sebum

ii) Mature B cell, which has not previously encountered antigen, is called as _____
   a) Plasma cell b) Pre B cell
   c) Pro B cell d) Naive B cell

iii) Killing of intracellular parasites is carried in _____ immune response.
   a) Cell mediated b) Humoral
   c) Primary d) Secondary

iv) Cell-mediated hypersensitivity is also called as _____
   a) Anaphylaxis b) Atopy
   c) Arthus reaction d) Delayed hypersensitivity

v) In the Rheumatoid Arthritis, systemic autoimmune disease _____ antibodies will act as Rheumatoid factor which binds with Fc region of IgG antibody.
   a) IgA b) IgG
   c) IgM d) IgD

P.T.O.

vi) Major changes in the antigenic structure of influenza viruses are called_____
a) Antigenic variation b) Antigenic shift
c) Signal transduction d) Attenuation

vii) _____ was awarded the Nobel Prize for discovery of human blood group system.
a) Landsteiner b) Ehrlich
c) Metalnikoff d) Dameshek

viii) Salk polio vaccine is example of _____ vaccine.
a) Killed viral b) Killed bacterial
c) Live viral d) Live attenuated bacterial

ix) _____ will be used for fusion of B lymphocytes and Myeloma cells in Hybridoma technique.
a) HGPRT b) PEG
c) Ig d) HAT

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

xi) Horny outer layer of the skin called stratum corneum is made up of _____
a) Sebum b) Fatty acid
c) Cartilage d) Keratin

xii) Interleukin (IL-2) is produced by _____
a) B cells b) Macrophages
c) T_H cells d) Neutrophils

xiii) Vit. B_{12} deficiency is observed in _____ autoimmune disease.
a) Phacoanaphylaxis b) Pernicious anemia
c) Myasthenia gravis d) SLE

xiv) In the B blood group person _____ iso-antibodies are present.
a) Anti-A b) Anti-B c) Anti-D d) Anti-O

2. Define and explain **any seven** of the following : **14**
   i) Opsonization
   ii) Primary immunity
   iii) Invasion
   iv) T cell independent antigen
   v) Autoantibodies
   vi) Innate immunity
   vii) Hypersensitivity
   viii) Monoclonal antibodies.

3. A) Answer **any two** of the following : **10**
   i) Explain second line of defense.
   ii) Explain antibody production against T cell dependent antigen.
   iii) Explain in detail cell mediated immunity.

   B) Explain type II hypersensitivity with example. **4**

4. Answer **any two** of the following : **14**
   i) Explain non-organ specific autoimmune diseases with examples.
   ii) Write an essay on immunity to bacteria.
   iii) Write an essay on ABO and Rh blood group system.

5. Answer **any two** of the following : **14**
   i) Explain blood group determination, cross-matching, direct and indirect Coomb's test.
   ii) Explain new trend vaccines with examples.
   iii) Write an essay on monoclonal antibody production and its applications.

SLR-CX – 34

Seat No.	

B.Sc. – II (Semester – III) (Biotechnology) (CGPA) Examination, 2017
IMMUNOLOGY – II

Time : 2.30 Hours | Total Marks : 70

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

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

i) In the adult human, there are about _____ neutrophils in the circulation.
a) 5×10^{15} b) 3×10^{10}
c) 4×10^{15} d) 5×10^{10}

ii) Macrophage-like cells present in lungs are called as _____
a) Langerhan b) Alveolar
c) Microglial d) Kuffer

iii) The mucosa-associated lymphoid tissue is _____
a) Peyer's patches b) Thymus
c) Lymph node d) Spleen

iv) In the class I MHC α-chain is encoded by _____ structure gene/s.
a) A b) B
c) C d) All of these

v) Two or more cytokines that mediate similar functions are called _____
a) Antagonist b) Synergetic
c) Redundant d) Pleiotropic

P.T.O.

vi) Antibody mediated complement activation is called _____ pathway.

a) Alternative b) Classical

c) Properdine d) Lectin

vii) T cell epitopes will be _____ antigens.

a) Soluble b) Hydrophilic

c) TCR presented d) MHC presented

viii) _____ antibody can pass the placenta.

a) IgA b) IgG

c) IgD d) IgM

ix) Viral antigens are processed and presented by _____ pathway.

a) Cytosolic b) Class II MHC

c) Complement d) Endocytic

x) _____ is the common marker on T cells.

a) CD8 b) B7

c) CD3 d) CD4

xi) IL-4 induces class witching to _____

a) IgG b) IgA

c) IgD d) IgE

xii) Blood born antigens are recognized in _____

a) Lymph node b) Thymus

c) Spleen d) Bone marrow

xiii) Wassermann test for diagnosis of syphilis is example of _____ test.

a) VDRL b) Kahn

c) Radioimmunoassay d) Complement fixation

xiv) Tritium (^{3}H) and Iodine (^{125}I) are used in _____ test.

a) Radioimmunoassay b) Immunofluorescence

c) ELISA d) Agglutination

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

   i) Apoptosis

   ii) Phagocytosis

   iii) Cascade mechanism

   iv) Immunogenicity

   v) Paratope

   vi) Endogenous antigen

   vii) Titre

   viii) Mitogen.

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

      i) What is hematopoiesis ? Explain mechanism of hematopoiesis.

      ii) Explain properties and functions of B cell, Plasma cell and B cell memory.

      iii) Explain the structure and functions of thymus.

   B) Explain the structure and function of Class I MHC molecule. **4**

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

   i) What is complement activation ? Explain the classical pathway of activation.

   ii) What is antigen ? Explain types of antigen with examples.

   iii) What is antibody ? Explain properties, structure and functions of IgA.

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

   i) Explain the antigen processing by cytosolic pathway.

   ii) Explain the properties of cytokines.

   iii) Write an essay on Complement Fixation Test.

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SLR-CX – 35

Seat No.	

B.Sc. – II (Biotechnology) (Semester – IV) (C.G.P.A.) Examination, 2017
MOLECULAR BIOLOGY – I

Time : 2.30 Hours | Total Marks : 70

Instructions : *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) DNA is polymer of _____
   a) Protein b) Carbohydrate
   c) RNA d) Nucleotide

2) The superior X-ray diffraction photograph of DNA was obtained by _____
   a) Watson and Crick b) Beadle and Tautum
   c) Wilkins and Rosalind Franklin d) Hershey and Chase

3) Replication which involves fragmentation of Parent Double helix is _____
   a) Conservative b) Semiconservative
   c) Dispersive d) Non dispersive

4) The technique adapted to study the process of replication in viciafaba was _____
   a) Autoradiography b) Microscopy
   c) Staining d) Both A and B

5) The first enzyme to be involved in prokaryotic replication is _____
   a) DNA Polymerase – I b) DNA Polymerase – II
   c) DNA Ligase d) DNA Helicase

6) The initiation Codons studied in the Genetic-code is _____
   a) AUG b) UCU
   c) UCC d) UGA

7) The Eukaryotic DNA is tightly Bound to Histone to form _____
   a) Nucleosome b) Chromosome
   c) Ribosome d) Polysome

8) Chemical and Physical agents that causes DNA damage are called _____
   a) Mutants b) Lesions
   c) Mutagen d) Mutation

9) The enzyme that plays an important role in recombination is _____
   a) Rec A b) Lec A
   c) Glycolases d) Endonucleases

10) The main function of Mitochondrial Genome is _____
   a) Phosphorylation b) Dephosphorylation
   c) Oxidative Phosphorylation d) Plastid formation

11) Chloroplast DNA is the remains of _____
   a) Cyanobacteria b) Archebacteria
   c) Eubacteria d) Probacteria

12) The area of unwinding and separation of DNA strands during replication is called _____
   a) Origin b) Primer
   c) Replication Fork d) Replicon

13) The distance between each nucleotide in DNA is _____
   a) 2.4 A° b) 3.4 A°
   c) 4.3 A° d) 3.6 A°

14) RNA does not possess _____
   a) Uracil b) Thymine
   c) Adenine d) Cytosine

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

   1) Define Central Dogma.
   2) Define Semidiscontinuous Replication.
   3) Define primosome.
   4) Define Melting Temperature.
   5) Write the function of DNA Helicases.
   6) Write any two differences between Z-DNA and B-DNA.
   7) Write any two diseases caused by defect in Mitochondrial DNA.
   8) What are Okazaki Fragments ?
   9) What is the function of Rec A protein ?

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 the important features of B-DNA.
      3) Write about the different modes of DNA replication.

   B) Solve :
   Write about the structure of DNA with neat labelled diagram. **4**

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

   1) Write in detail DNA organization in bacteria with a neat labelled diagram.
   2) Explain Genetic code with its properties.
   3) Write about cot curves and its analysis.

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

   1) Explain in detail about DNA replication in prokaryotes with neat labelled diagram.
   2) Explain in detail about Mismatch and Excision DNA Repair.
   3) Explain in detail “D Loop” Model of replication in Mitochondria.

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SLR-CX – 36

Seat No.	

B.Sc. – II (Biotechnology) (Semester – IV) (CGPA) Examination, 2017
MOLECULAR BIOLOGY– II

Time : 2.30 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 eukaryotes, RNA polymerase II transcribes _____
   a) mRNA b) tRNA
   c) rRNA d) All of these

2) In prokaryotes, extrinsic termination of transcription is carried out with help of _____
   a) Sigma factor b) Rho factor
   c) Pol-α d) Core enzyme

3) During mRNA processing poly 'A' tail is formed at _____ end of mRNA molecule.
   a) Only at 5' b) Both 5' and 3'
   c) Only at 3' d) None of these

4) Ribosome binding site on the mRNA molecule having AGGAGGU sequences is called _____
   a) Consensus b) Promoter
   c) Shine-Dalgarno d) None of these

5) In lac operon, Galactoside permaese enzyme is encoded from _____ gene.
   a) lac 'a' b) lac 'b' c) lac 'z' d) lac 'y'

P.T.O.

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

7) _____ enzyme is attaches amino acids to tRNA molecule prior to translation process.
   a) Aminoacyl tRNA synthetase b) DNA glycosylase
   c) Peptidyl di-sulphide isomerase d) Peptidyl transferase

8) _____ model of tRNA was proposed by Robertson.
   a) Clover leaf b) Fluid mosaic
   c) Hairpin loop d) Double helix

9) Codons GGG, GGA, GGA and GGU specify same amino acid, this property of genetic code is called _____
   a) Non-ambiguous b) Degeneracy
   c) Overlapping d) Ambiguous

10) _____ plays important role in protein folding.
   a) Chaperons b) Histones
   c) Proteasome d) Proteases

11) In lactose operon model _____ is act as inducer.
   a) Glucose b) Galactose
   c) Lactose d) Fructose

12) The expression of most genes is also regulated by even more distant DNA elements called _____
   a) Silencers b) Promoters
   c) Operators d) Enhancers

13) _____ is responsible for removal of introns from pre-mRNA molecule.
   a) Spliceosome b) Polysome
   c) Enhanceosome d) Replisome

14) Removal of acetyl groups from the core histones by a family of enzymes called _____
   a) Histone acetyltransferases b) Histone transacetylases
   c) Histone methylases d) Histone deacetylases

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

   i) What is anti-termination ?

   ii) Write a note on proteasomes.

   iii) What is transcription factors ?

   iv) What is molecular chaperons ?

   v) What are transcriptional repressors ?

   vi) What is translocase ?

   vii) Write a note on mRNA stability.

   viii) Write a note on CTD domain of RNA polymerase II.

   ix) What are activators ?

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

      i) Explain mechanism of signal integration with suitable example.

      ii) Describe termination of transcription in prokaryotes.

      iii) Explain structure of ribosome.

   B) Explain alternative splicing mechanisms. **4**

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

   i) Describe regulation of lac operon in bacteria.

   ii) Describe process of translation in prokaryotes.

   iii) Explain post-translational modifications in proteins.

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

   i) Describe process of transcription in eukaryotes.

   ii) Describe process of mRNA processing in eukaryotes.

   iii) Explain signal transduction in gene regulation with suitable examples.

SLR-CX – 37

Seat No.	

B.Sc. (Part – II) (Semester – IV) (Biotechnology) (CGPA) Examination, 2017
PLANT TISSUE CULTURE

Time : 2.30 Hours | Total Marks : 70

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

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

i) Embryos derived naturally from diploid ovary cells are _____ embryos.

a) Zygotic b) Non-zygotic
c) Somatic d) None of the above

ii) Auxins are involved in _____

a) Cell elongation b) Cell multiplication
c) Apoptosis d) Senescence

iii) _____ is one of the vitamins used in plant tissue culture media.

a) Pyridoxine b) IAA c) 2, 4-D d) Absissic acid

iv) The part of a plant used for culturing is called _____

a) Callus b) Cell suspension
c) Stock d) Explant

v) Stomata are more open in plants grown in presence of higher_____

a) Uranium b) Potassium
c) Magnesium d) Calcium

vi) The pH of the medium is usually adjusted between _____ before sterilization.

a) 3.0 to 4.5
b) 5.0 and 6.0
c) 7.5 to 9
d) 8.5 to 9.5

vii) Explants are commonly surface-sterilized by using _____

a) Formalin
b) Sodium hypochlorite
c) Nutrient medium
d) Sterile water

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) *In vitro* clonal multiplication of a plant species is known as_____

a) Embryogenesis
b) Parthenogenesis
c) Somaclonal variation
d) Micropropagation

x) Culture of excised anthers to obtain haploid plants is known as _____ culture.

a) Anther
b) Meristem
c) Callus
d) Protoplast

xi) _____ is used for preparation of synthetic seeds.

a) Agar
b) Ca^{2+} ions
c) Sodium alginate
d) Difco agar

xii) 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

xiii) Elements required by plants in lower concentration than 0.5 mmol/liter referred as _____

a) Surfactants b) Fusagens

c) Macromolecules d) Micromolecules

xiv) A tissue arising from disorganized proliferation of cells in culture is called _____

a) Shoot tip b) Protoplast

c) Anther d) Callus

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

i) What is laboratory fumigation ?

ii) What is a protoplast ?

iii) Enlist any 4 vitamins with their importance in culture media.

iv) What is an explant ?

v) Mention any two laboratory safety measures.

vi) Differentiate between organ culture and organogenesis.

vii) Define totipotency.

viii) Define artificial seed.

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

   i) Explain in brief-isolation of protoplast by enzymatic method.

   ii) Describe the method of preparation of synthetic seed.

   iii) Write a note on anther culture.

   B) Write a note on factors affecting protoplast culture. **4**

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

   i) Write in detail about – Callus Culture.

   ii) Discuss General Plant Tissue Culture Laboratory design and equipment used for Plant Tissue Culture technique.

   iii) Write in detail about micropropagation and add a note on plant hardening.

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

   i) Discuss the sterilization techniques with their principle used in Plant Tissue Culture laboratory.

   ii) Write in detail about plant growth regulators.

   iii) Give a detailed account on -somatic embryogenesis.

SLR-CX – 38

Seat No.	

B.Sc. – II (Biotechnology) (Semester – IV) Examination, 2017
ANIMAL TISSUE CULTURE (CGPA)

Time : 2.30 Hours Total 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) Laminar air flow platform sterilized by using _____
   a) 70% ethanol b) 100% ethanol
   c) 50% ethanol d) 30% ethanol

2) In _____ year carrel designed suitable flask for routine animal cell culture
   a) 1915 b) 1923 c) 1925 d) 1924

3) Which of the following material used for treatment of substrate surface ?
   a) Albumin b) Transferrin
   c) Collagen d) Casein

4) _____ serum is routinely used in animal cell culture.
   a) Horse b) Amphibian
   c) Insect d) Bovine

5) Isolation of specific cell from tissue for culture is carried out by _____ method.
   a) Disaggregation b) Heat shock
   c) Centrifugation d) Radiation

6) Transfer of cell from primary culture to form secondary culture is known as _____
   a) Trypsinization b) Sub culturing
   c) Enzymatic disaggregation d) Mechanical disaggregation

7) _____ serum may also be less likely to metabolize polyamines due to lower level of polyamine oxidase.
   a) Camel b) Bovine
   c) Horse d) Goat

8) _____ chemical used to block the cell in S phase to get cell synchrony.
   a) EDTA b) Streptomycin
   c) Tetracycline d) Thymidine

9) _____ is usually measured by depression of the freezing point.
   a) Osmolality b) Apoptosis c) Temperature d) Karyotyping

10) The term _____ implies a medium that has had all its constituents and supplements added and is sufficient for the use specified.
   a) MS media b) Complete media
   c) Protein media d) Serum free media

11) The most sensitive assay used for protein determination is _____
   a) Biuret assay b) BCA assay
   c) Lowry assay d) Nicolson's assay

12) Loss of _____ of cells is often indicated by a damaged cell membrane.
   a) Capability b) Capacity c) Intensity d) Viability

13) A cell line can be identified by use of fluorescent labeled antibody specific for _____ antigen.
   a) Membrane b) Protein
   c) Lipid d) Internal

14) In primary culture, cell divide to give different type of cells by _____ process.
   a) Proliferation b) Differentiation c) Cultivation d) Initiation

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

1) Write a note on substrate for cell growth.
2) Describe in brief serum free media.
3) Explain in brief criteria for subculture.
4) Define cell synchronization.

5) Explain in brief cell counting.
6) Write a note on how much compound formed in production strategy.
7) Enlist physiological properties of media.
8) How will you carry out sterilization of apparatus.
9) Write a note on cell determination by glucose.

3. A) Answer the following **(Any two)** : **10**
   1) Explain karyotyping for identification of cell line.
   2) Give details of warm trypsinization.
   3) Discuss analysis of cell cycle by flow cytometer.

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

4. Answer the following **(Any two)** : **14**
   1) Give details of natural media.
   2) Describe instruments used in ATC.
   3) Discuss glycoprotein production from mammalian cells.

5. Answer the following **(Any two)** : **14**
   1) Discuss in detail cell synchronization.
   2) Explain selection and maintenance of cell line.
   3) Describe efficiency and productivity of culture system.

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SLR-CX – 39

Seat No.	

B.Sc. (Part – II) (Semester – IV) (CGPA) Examination, 2017
BIOTECHNOLOGY
Bioenergetics and Enzymology

Time : 2.30 Hours | Total 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) For allosteric enzymes the substrate concentration against velocity gives _____ curve.

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

ii) 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

iii) The enzymes above their optimum temperature losses the activity because of _____ protein.

a) Denaturation b) Renaturation
c) Precipitation d) Isomerization

iv) In non competitive inhibition of enzyme the Km of reaction is _____

a) Increases b) Constant
c) Decreases d) Doubled

v) _____ is the quantitative expression for the state of randomness or disorder in system.

a) Gibb's free energy b) Enthalpy
c) Entrophy d) Equilibrium constant

P.T.O.

vi) The reaction is said to be at equilibrium when its actual free energy change is _____

a) Negative
b) Positive
c) Zero
d) One

vii) The effect of pH on enzyme gives _____ curve.

a) Parabolic
b) Ellipsoidal
c) Sigmoidal
d) Bell shape

viii) The electron-donating molecule in an oxidation reduction reaction is called the _____

a) Oxidant
b) Reductant
c) Oxidizing agent
d) Both a and c

ix) In digit Enzyme Commission number the third place indicates _____

a) Class
b) Sub-class
c) Sub sub-class
d) Serial number

x) _____ inhibitor can bind only to enzyme substrate complex not to free enzyme.

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

xi) _____ is non proteinateous enzyme.

a) Abzyme
b) Ribozyme
c) Trypsin
d) Pepsin

xii) Chymotrypsin is activated by _____

a) Phosphorylation
b) Proteolytic cleavage
c) Dephosphorylation
d) Allosteric modification

xiii) The protein part of holoenzyme is known as _____

a) Apoenzyme
b) Coenzyme
c) Cofactor
d) Prosthetic group

xiv) Enzymes having different structural, functional property but having same biological function are known as_____

a) Ribozyme
b) Isozyme
c) Abzyme
d) Apoenzyme

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

   a) Define mass action ratio of reaction.

   b) Give the statement of first law of thermodynamics.

   c) What is reduction reaction ? Give one example.

   d) Define high energy compound. Give one example.

   e) Explain the term specific activity and turn over number.

   f) Discuss lock and key mechanism of enzyme.

   g) What is latent enzyme ? Give one example.

   h) What is limitation of Lineweaver Burk equation ?

   i) What is transferases enzyme ? Give its general reaction.

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

      a) Explain the properties of free energy change.

      b) Discuss the reaction of group transfer reaction and isomerization with one example.

      c) Describe the active site of enzyme and its features.

   B) Explain the effect of temperature, product concentration on enzyme activity. **4**

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

   a) Derive Michaelis-Menten equation. Add a note on significance of Km and Vmax.

   b) Discuss in brief various regulatory mechanism of enzyme.

   c) Explain in detail ATP as universal currency of free energy in biological system.

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

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

   b) What is biological half reactions ? Add a note on electron transfer from biomolecules.

   c) Write a note on inhibition of enzyme with kinetics.

SLR-CX – 40

Seat No.	

B.Sc. – II (Biotechnology) (Semester – IV) (CGPA) Examination, 2017
METABOLISM

Time : 2.30 Hours | Total 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 sentences by using **correct** alternative. **14**

1) _____ is not an intermediate of citric acid cycle.
   a) Oxaloacetate b) Pyruvate
   c) Fumarate d) Succinate

2) Lipids are stored in the body mainly in the form of _____
   a) Phospholipids b) Glycolipids
   c) Triacylglycerides d) Fatty acid

3) The carbon atom in urea is provided by _____
   a) CO_2 b) Aspartate
   c) Ornithine d) None of these

4) _____ has highest affinity for electron in electron transport chain.
   a) Cytochrome c b) Ubiquinone
   c) FAD d) FMN

5) In Glycolysis the net ATP produced are _____
   a) 2 b) 4
   c) 1 d) 3

6) _____ is the first stable product formed in C3 pathway of CO_2 fixiation.
   a) Phosphoglyceric acid b) Phosphoglyceraldehyde
   c) Oxaloacetate d) Ribulose bisphosphate

P.T.O.

7) Which of the following substrate represents the unsaturated fatty acid ?

a) Palmitate b) Stearate

c) Choline d) Oleate

8) _____ is the prosthetic group of NADH Co Q reductase.

a) Heme b) NADP

c) FMN d) Mg2+

9) In PS I _____ is the reaction center.

a) P 700 b) P 680

c) P 860 d) P 760

10) The amino acid are said to be ketogenic when the carbon skeleton is finally degraded to _____

a) Succinyl CoA b) Fumarate

c) Acetyl CoA d) Pyruvate

11) _____ is not a substrate for gluconeogenesis pathway.

a) Glycerol b) Lactate

c) Oxaloacetate d) Glycogen

12) Most of the CO_2 form catabolism of glucose is released during _____

a) Glycolysis b) Lactate fermentation

c) Oxidative fermentation d) Krebs cycle

13) _____ is the end product of purine catabolism in human.

a) CO_2 b) Lactic acid

c) Ethanol d) Uric acid

14) _____ Blocks electron transfer in NADH Q reductase and there by prevent the utilization of NADH as substrate.

a) Amytal b) Rotenone

c) Both a and b d) CN^-

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

   1) Write on Energetics of ethanol and lactic acid fermentation.

   2) Define transamination and give one example.

   3) Give net yield of ATP production from beta oxidation of palmitic acid.

   4) Write note on Glycerol 3 phosphate shuttle.

   5) Define photosystem and give difference between PS I and PS II.

   6) Give the significance of PPP.

   7) Write on regulation of cholesterol metabolism.

   8) Write names of Ketogenic and glucogenic amino acid.

   9) Draw structure of chloroplast.

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

      1) Explain ATP synthase complex with neat labeled diagram.

      2) Draw the structure of mitochondria and give its role.

      3) Explain the pathway for synthesis of glucose from non carbohydrate sources.

   B) Write brief note on Urea cycle. **4**

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

   1) Give detail account on component of respiratory chain and electron transfer across its.

   2) Write an account on non cyclic photophosphorylation.

   3) Explain in detail de novo synthesis of Pyrimidine.

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

   1) Give a detail account on synthesis of even chain unsaturated fatty acid.

   2) Explain the C_3 cycle.

   3) Give detail account on cholesterol biosynthesis with its regulation.

SLR-CX – 41

Seat No.	

B.Sc. – III (Biotechnology) (Semester – V) (New-CGPA) Examination, 2017
ENGLISH (Compulsory)
Breakthrough

Time : $2^{1}/_{2}$ Hours 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 about the Press is not true ?
   a) The newspapers are owned by rich men
   b) People get their opinions from the newspapers
   c) The Press is free
   d) Honest editors and journalists are replaced by subservient ones

2) According to G. B. Shaw,the _____ is a despoiler and oppressor of the poor.
   a) Parson b) Peasant
   c) Journalist d) Squire

3) The Gettysburg Address was delivered by Abraham Lincoln on _____
   a) 19 November 1863 b) 19 November 1683
   c) 19 July 1863 d) 19 July 1683

4) Abraham Lincoln and other Americans gathered at Gettysburg battlefield to
   a) To celebrate their victory in a civil war
   b) To dedicate a cemetery for the soldiers who died there
   c) To mourn the death of soldiers who died there
   d) To thank American people for their support in the civil war

5) The flower mentioned in the poem "*Abou Ben Adhem*" is _____
   a) Rose b) Lily
   c) Jasmine d) Lotus

6) The poem "O Captain! My Captain!" is

a) A sonnet b) A lyric

c) An elegy d) A ballad

7) Which of the following statements about women is not true ?

a) In the 19th century women were encouraged to be an artist

b) Anonymity runs in the blood of women

c) A Woman must have money and a room of her own if she is to write fiction

d) Even in the 19th century, women were slapped, lectured and exhorted

8) According to Virginia Woolf, chastity had then a _____ importance in a woman's life.

a) Political b) Social

c) Economical d) Religious

9) Abou Ben Adhem was blessed by God because _____

a) He loved God b) He loved his fellow men

c) He offered gold to an angel d) He loved an angel

10) The Captain in the poem is also called a dear _____

a) Brother b) Leader

c) Father d) Revolutionary

B) Rewrite the following sentences choosing the correct modal auxiliary from the brackets : **2**

1) I _____ swim hours in my childhood. (can, could, may, should)

2) _____ you mind giving me your bike ? (Would, Must, Might, Shall)

C) Write the following sentences in indirect speech : **2**

1) Kavita said to Rita, "Where are you going ?"

2) He said to me, "Post this letter at once."

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

1) Why does G. B. Shaw call the parson an ally of the squire ?

2) How does the rich contribute to the corruption in the field of education ?

3) What are the principles on which the U.S.A. was founded ?

4) What responsibility does Lincoln assign to the people assembled at the Gettysburg ?

5) What was the fate of the gifted woman in the 16th century ?

6) How does society erode the talents of women writers ?

7) What does G.B. Shaw say about the Religion ?

8) Why do Judith's parents keep her from nurturing her talent ?

9) What was the cause of the American civil war ?

3. A) Answer **any two** of the following : **8**

1) Give two examples of metaphors used in the poem *O Captain! My Captain!*.

2) What did Abou Ben Adhem see in his dream ?

3) What is the central idea of the poem *O Captain! My Captain!* ?

B) Write short reports on **any two** of the following : **6**

1) The inaugural function of Science Association of your college.

2) Farmers' suicides in Maharashtra.

3) Your visit to National Chemical Laboratory, Pune.

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

1) Prepare a presentation consisting of five charts or slides to promote a "Roti Maker" in the market.

2) Write a presentation on the topic "Safety of Women" using charts, transparencies or slides.

5. Write a transcript of group discussion on the topic "Foreign Direct Investment (FDI) in retail – good or bad?". **14**

SLR-CX – 42

Seat No.	

B.Sc. (Part – III) (Semester – V) (New CGPA) Examination, 2017
BIOTECHNOLOGY
Plant Development

Time : 2.30 Hours | Total Marks : 70

N.B. *: 1) Figures to the **right** indicate **full** marks.*
*2) Draw a **neat, well** labeled, complete diagram **wherever** necessary.*
*3) **Use** of calculators, cell phones, or any other electronic gadgets is **prohibited**.*
*4) **All** questions are **compulsory**.*

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

1) _____ is the fused product of two polar nuclei in the embryo sac.
   a) Zygote b) Oospore
   c) Definitive nucleus d) Antipodal

2) After fertilization, egg-cell develops into _____
   a) Male gametes b) Female gametes
   c) Oospore d) Fruit

3) _____ ovule is the most common type of ovule found in Angiosperms.
   a) Orthotropous b) Anatropous
   c) Hemianatropous d) Circinotropous

4) In bisexual flowers to check self-pollination, stamens or anthers are removed in bud condition, a technique is known as _____
   a) Hybridization b) Cutting
   c) Emasculation d) All of these

5) _____ type is the type of endosperm formation in which the first division and several of the following divisions are unaccompanied by wall formation.
   a) Helobial b) Nuclear
   c) Cellular d) Acellular

6) Exine of pollen is composed of _____
   a) Sporopollenin b) Chitin
   c) Peptidoglycan d) Collagen

7) Cytokinins are involved in
   a) Cell elongation b) Cell multiplication
   c) Apoptosis d) Senescence

8) Culture of embryos excised from immature or mature seeds is called as _____
   a) Embryo culture b) Somatic embryogenesis
   c) Emasculation d) Embryogeny

9) A sexual seeds which produce progeny identical to the female parent are called as _____ seeds.
   a) Parthenocarpic b) Apomictic
   c) Hybrid d) Artificial

10) The flowers which remain closed normally are called _____
   a) Cleistogamous flower b) Deistogamous flower
   c) Chasmogamous flower d) All of these

11) _____ is the albuminous seed.
   a) Gram b) Pea c) Bean d) Cotton

12) The embryo evolved in culture medium are known as _____
   a) Adventitious embryos b) Somatic embryo
   c) Embryoids d) All of these

13) Genome size of Arabidopsis thaliana is
   a) 135 Mbp b) 3 Mbp c) 140 Mbp d) None of the above

14) Indole-3-acetic acid (IAA) is derived from _____
   a) Glycine b) Tryptophan
   c) Histidine d) Aspartic acid

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

   1) Define Entomophily. Give an example of it.

   2) What is a pollen ? Draw a neat, labeled diagram of it.

   3) Write the significance of double fertilization.

   4) What are the practical applications of auxins ?

   5) What is polyembryony ? Mention a practical application of it.

   6) Define seed and write the importance of seed.

   7) Write the different methods to store pollen grains.

   8) What are the salient features of *Arabidopsis thaliana* ?

   9) What are the functions of stomata ?

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

      1) What are the different modes of entry of pollen tube into ovule ?

      2) How does the Pollen-Pistil interaction occur ?

      3) Explain flowering pattern in Angiosperms.

   B) Explain the process of fertilization in Angiosperms. **4**

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

   1) Write a note on Development of male gametophyte.

   2) Give general account on cytokinins with its practical application.

   3) Write a short note on cell wall formation.

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

   1) Explain the leaf development in plants.

   2) Describe the endosperm formation with its type.

   3) Define pollination and discuss the vectors of pollination in detail

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SLR-CX – 43

Seat No.	

B.Sc. – III (Biotechnology) (Semester – V) (New CGPA) Examination, 2017
ANIMAL DEVELOPMENT

Time : 2.30 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) Recapitulation theory was proposed by _____
   a) Weismann b) Roux
   c) E. Haeckel d) Child

2) The process by which an embryonic tissue influences other tissues to differentiate is called as _____
   a) Transplantation b) Grafting
   c) Induction d) Activation

3) Synthesis and deposition of Yolk is called as _____
   a) Pre-vitellogenesis b) Vitellogenesis
   c) Spermiogenesis d) Oogenesis

4) _____ cells are known as nurse cells.
   a) Sertoli b) Leydig
   c) Sperm d) Spermatogonial

5) Chemical nature of fertilizin molecule is _____
   a) Glycoprotein b) Acid mucopolysaccharides
   c) Lipids d) Fatty acids and glycerol

P.T.O.

6) Hen egg is characterized by _____ type of cleavage.
   a) Superficial meroblastic
   b) Radial holoblastic
   c) Discoidal meroblastic
   d) Spiral holoblastic

7) Human egg is an example of _____
   a) Centrolecithal
   b) Telolecithal
   c) Mesolecithal
   d) Microlecithal

8) According to Gilchrist (1968), the prospective _____ is called "Zone of involution".
   a) Ectodermal zone
   b) Endodermal zone
   c) Mesodermal zone
   d) None of these

9) The number of chromosomes in adults produced parthenogenetically is _____
   a) Haploid
   b) Triploid
   c) Diploid
   d) Polyploid

10) Cancer develops from epithelial tissue is called as _____
   a) Sarcoma
   b) Carcinoma
   c) Osteoma
   d) Lymphoma

11) Gemmule formation is commonly observed in _____
   a) Arthropods
   b) Annelids
   c) Sponges
   d) Echinoderms

12) Lipid oxidation of cellular membranes is the source of _____
   a) Peroxides
   b) Free radicals
   c) Chalones
   d) Lipofuchsin

13) The hormone involved in the metamorphosis of tadpole is _____
   a) Prolactin
   b) Thyroxine
   c) TSH
   d) Somatotrophin

14) Tumor suppressor gene is also called as _____
   a) Oncogene
   b) Proto-oncogene
   c) Anti-oncogene
   d) None of these

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

i) Give Organizer theory of Spemann.

ii) Give Hayflick limit theory of aging.

iii) How polyspermy is prevented ?

iv) Write a note on significance of fertilization.

v) Write a note on Corpus luteum.

vi) Write a note on laws of cleavage.

vii) What is primitive streak ?

viii) Write a note on levels of differentiation.

ix) Write a note on types of regeneration.

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

i) Describe blastulation in telolecithal egg with suitable example.

ii) Describe mechanism of regeneration in amphibians with suitable example.

iii) Describe Fate map of discoblastula.

B) Describe structure of Graffian follicle neat labelled diagram. **4**

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

i) Describe process of oogenesis with neat labeled diagram.

ii) Describe construction of fate maps by natural and artificial marking.

iii) Explain process of fertilization with neat labeled diagram.

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

i) Describe process metamorphosis insects with suitable examples.

ii) Explain different planes and types of cleavage with suitable examples.

iii) Describe different types of asexual reproduction with neat labeled diagram.

SLR-CX – 44

Seat No.	

B.Sc. Biotechnology (Part – III) (Semester – V) (New CGPA)
Examination, 2017
BIOINFORMATICS AND NANOTECHNOLOGY

Time : 2.30 Hours Total Marks : 70

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

1. Rewrite the sentence using **correct** alternative given below : **14**

1) FASTA algorithm was described by _____
   a) Altschul b) Lipman and Pearson
   c) Wunch d) Smith-Waterman

2) The possible translational reading frame in every nucleic acid sequence is _____
   a) Three b) One c) Six d) Nine

3) The PubMed provides information of _____ database.
   a) Nucleotide b) Protein
   c) Genome d) Literature

4) The study of complete genome of organism is known as _____
   a) Proteomics b) Metagenomics
   c) Genomics d) Pharmacology

5) SWISS-PROT represents _____ database.
   a) Nucleic acid sequence b) Protein sequence
   c) Genome sequence d) Cancer chromosome

6) The term nano was first coined by _____
   a) Alexander Fleming b) Richard Fynmann
   c) John Tyndall d) Rutherford

7) _____ is not a Structural Database.
   a) PD b) NDB c) GenBank d) MMDB

P.T.O.

8) _____ is the gathering of entities without any external influence.
   a) Polymerization b) Degradation
   c) Isomerization d) Self assembly

9) For investigations of surfaces by atomic force microscopy, a pointed tip is mounted on a _____ which then mounted on a piezo drive.
   a) Cantilever b) Photomultiplier
   c) Photodiode d) Monochromator

10) The ability of one molecule to attract and bind to another is often referred to as _____
   a) Crystallization b) Molecular recognition
   c) Agglumeration d) Coagulation

11) High energy ball milling is a _____ method of nanoparticle synthesis.
   a) Physical b) Chemical
   c) Biological d) Natural

12) Nano particles are used in _____ therapy by placing a nanodot inside the body and illuminating it from outside.
   a) Imaging b) Chemo
   c) Photodynamic d) Natural

13) Tree view is used for constructing _____
   a) Multiple alignment b) Dendogram tree
   c) Local alignment d) Global alignment

14) Sanger Centre, HGMP-RC, EBI is hosted by _____
   a) Hinxton Hall b) MIPS c) UCL d) NCBI

2. Answer **any seven** of the following : **14**
   1) What is SRS ?
   2) What is NRL-3D ?
   3) What is ESTs and GSTs ?
   4) Which techniques are used for synthesis of nano materials by physical methods ?
   5) What are different sizes of matter ? How much is a nano size ?

6) Enlist different types of lithography.
7) What is quantum mechanics ?
8) What is CATH database ?
9) What is phylogeny ?

3. A) Answer **any two** of the following : **10**
   1) Write a note on Entrez.
   2) Write about polymerization of nano materials.
   3) Write mechanical method for nano particle synthesis.

   B) Describe in detail the tools used for gene prediction. **4**

4. Answer **any two** of the following : **14**
   1) Write a note on secondary protein sequence databases.
   2) Describe various properties of nanostructures.
   3) Describe the applications of nanomaterials in cleaning environment.

5. Answer **any two** of the following : **14**
   1) What is structural database ? Explain any three Protein Structural Databases.
   2) What is lithography ? Describe the lithography tools used to measure nanostructures.
   3) What is *in silico* ? Explain the *in silico* tools used in the analysis protein sequences.

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SLR-CX – 45

Seat No.	

B.Sc. (Part – III) (Semester – V) (New CGPA) Examination, 2017
BIOTECHNOLOGY
Recent Trends in Biotechnology

Time : 2.30 Hours | Total 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) _____ group of cysteine is suitable for covalent binding under mild conditions.

a) Hydroxyl
b) Imidazile
c) Phenol
d) Thiol

ii) _____ refers to the uptake of contaminants with the subsequent breakdown and metabolization by plant itself.

a) Phytodegradation
b) Bioaugmentation
c) *In-situ* bioremediation
d) *Ex-situ* bioremediation

iii) _____ method is used if the segment of gene to be mutated lies between two closed spaced, unique, restriction enzyme cleavage sites.

a) Random chemical mutagenesis
b) Cassette mutagenesis
c) PCR directed mutagenesis
d) Site directed mutagenesis

iv) In toxicology _____ term is used to describe the process of evaluating risks associated with exposure to a certain chemical substance.

a) Risk extrapolation
b) Regulatory toxicology
c) Acute lethality
d) Dose response relationship

P.T.O.

v) _____ enzyme carry out the process of trans-esterification.

a) Aspartase b) Ligase
c) Lipase d) Glucose isomerise

vi) Glucose isomerase can be made more efficient by replacing its _____ residue at 253 position of enzyme.

a) Lysine b) Arginine
c) Glycine d) Alanine

vii) In dairy industry _____ Enzyme has significant role.

a) Racemase b) Lactase
c) Glucoseisomerase d) Penicillinase

viii) The dosage of chemical needed to produce death in 50 percent of the treated animal is _____

a) LD 50 b) MD 50
c) MLD d) LD 30

ix) _____ technology is used to purify contaminated air evolved from volatile organic compound by involving microorganisms.

a) Bioleaching b) Phytoremediation
c) Biofiltration d) Bioremediation

x) Phase I reaction of biotransformation involves _____ reactions.

a) Conjugation b) Synthetic
c) Ligation d) Oxidation and reduction

xi) Production of novel proteins by using recombinant DNA technology is known as _____

a) Metabolic engineering b) Solvent engineering
c) Protein engineering d) Chemical engineering

xii) hES cells were first isolated and cultured in _____ from embryos donated by couples no longer intending to use them for their own infertility treatment.

a) 1938 b) 1952 c) 1996 d) 1998

xiii) Human genome project was initiated by _____

a) NIH and DOE b) NIH and EBI

c) NIH and DDBJ d) DOE and DDBJ

xiv) Direction of metabolic flux can be determined by using _____ equation.

a) $r = Ax$ b) $E = mc^2$ c) $W = fd$ d) $A = rx$

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

a) Write a note on lipase function.

b) Define Enzyme immobilization.

c) State the principal of metabolic engineering.

d) What are the properties of ideal carrier material ?

e) Define the term Xenobiotic.

f) What are the principles of toxicology ?

g) What ethics are involved in stem cell research ?

h) Explain term bioleaching.

i) Differentiate between the *In-situ* and *Ex-situ* bioremediation.

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

a) Give the industrial application of any five immobilized enzymes.

b) Illustrate in detail the entry of xenobiotic through inhalation and skin.

c) Explain bioaugmentation process.

B) Write a note on site directed mutagenesis. **4**

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

a) Define enzyme engineering and solvent engineering. Add a note on application of enzyme engineering.

b) Write a note on ethics in Xenotransplantation.

c) Explain the technologies used to treat the industrial waste water.

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

a) Explain the methods used to immobilization of enzymes.

b) Write a note on detoxification mechanism in human body.

c) Discuss Metabolic Flux Analysis (MFA) and metabolic control analysis.

_____

SLR-CX – 46

Seat No.	

B.Sc. – III (Semester – V) (Old) (Biotechnology) Examination, 2017
ENGLISH COMPULSORY
Breakthrough

Time : 2 Hours Max. Marks : 50

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

1. A) Rewrite the following sentences by choosing the correct options given below. **6**
   1) G.B. Shaw says, in revolutions, it is the respectful _____ who burn the country houses and parsonages.
      a) rich b) lords c) warriors d) peasants
   2) The Gettysburg Address is the famous speech delivered by President Lincoln at Gettysburg in
      a) 1861 b) 1863 c) 1860 d) 1862
   3) Shaw asserts that the poor are kept poor by their
      a) poverty b) knowledge c) ignorance d) craft
   4) In A Room of One's Own Virginia Woolf imagines a _____ of Shakespeare.
      a) cousin b) sister c) daughter d) disciple
   5) Abu Ben Adhem was blessed by the _____ of God.
      a) hatred b) curse c) love d) angel
   6) "O Captain ! My Captain ! Our fearful _____ is done".
      a) trip b) job c) task d) dream

   B) Rewrite the following bits by selecting the correct modals. **2**
   1) If he works hard, he _____ succeed.
      a) could b) might c) may d) had to
   2) The team took a decision that it _____ do more net-practice.
      a) will b) might c) shall d) would

   C) Do as directed. **2**
   1) Radhika said, "I am going to work hard from today".
      (Change into Indirect Speech)
   2) Karim asserted that he would see his teacher the next day.
      (Change into Direct Speech).

P.T.O.

2. Answer **any five** of the following questions in **2** to **3** sentences **each**. **10**
   a) How has Shaw brought out the corruption in Church ?
   b) What did Lincoln say about the sacrifice of the brave men ?
   c) How does the society destroy the talents of women writers ?
   d) Give the definition of democracy according to Lincoln.
   e) What was the opinion of the old Bishop about women ?
   f) How would the peasants behave during a revolution ?

3. A) Answer **any two** of the following questions in about **fifty** words **each**. **6**
      1) What did Abu Ben Adhem see in his vision ?
      2) Why is the poet making an appeal to the Captain to rise ?
      3) How did Abu's name lead all the rest in the book of gold ?

   B) Write reports in brief on **any two** of the following : **4**
      a) Making veg pulaav.
      b) Visit to a zoo in your city.
      c) A road accident you saw.

4. Prepare a presentation script on **any one** of the following using charts or slides. **10**
   I) Merits of democracy.
   II) Promotion of a newly launched 'hatch-back car'.

5. Ramesh, Sara, Manila and James participate in a group discussion on 'Twenty-twenty Cricket Matches', write a script of the discussion by using points in favour of and against the subject. **10**

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SLR-CX – 47

Seat No.	

B.Sc. (Biotechnology – III) (Semester – V) (Old) Examination, 2017
PLANT DEVELOPMENT

Time : 2 Hours | Total Marks : 50

N.B. : *1) Figures to the **right** indicate **full** marks.*
*2) Draw a **neat**, well labeled, complete diagram **wherever** necessary.*
*3) **Use** of calculators, cell phones, or any other electronic gadgets is **prohibited**.*
*4) **All** questions are **compulsory**.*

1. Choose **correct** answer from given alternative and rewrite the sentence. **10**

1) Which of the following is the most common type of ovule found in Angiosperm ?
   a) Orthotopous ovule
   b) Anatropous ovule
   c) Hemianatropous ovule
   d) Circinotropous ovule

2) In bisexual flowers to check self pollination stamens or anthers are removed in bud condition, a technique is known as _____
   a) Hybridization
   b) Cutting
   c) Emasculation
   d) All of these

3) The entry of pollen tube through integuments is known as _____
   a) Mesogamy
   b) Prorogamy
   c) Chalazogamy
   d) Monogamy

4) _____ is the type of endosperm formation in which the first division and several of the following divisions are unaccompanied by wall formation.
   a) Helobial type
   b) Nuclear type
   c) Cellular type
   d) Acellular type

5) _____ is the exalbuminous seed.
   a) Castor
   b) Pea
   c) Rice
   d) Wheat

P.T.O.

6) When the basal as well as apical cells contribute to the development of embryo is known as _____

a) Asterad type
b) Crucifer type
c) Solanad type
d) Chenopodial type

7) Arabidopsis thaliana is member of _____

a) Brassicaceae
b) Arabidopsis
c) Asteraceae
d) Bignoniaceae

8) _____ is/are the component of cell wall.

a) Cellulose
b) Hemicellulose
c) Pectin
d) All of these

9) Which of the following are the physiological effects of Auxin ?

a) Cell division
b) Cell elongation
c) Root initiation
d) All of these

10) _____ is also known as stress hormone.

a) Auxin
b) Abscisic acid
c) Cytokinins
d) Gibberellins

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

1) Write the different methods to store pollen grains.
2) Define fruit and give its types.
3) What is meant by Hydrophily ?
4) What are the significance of double fertilization ?
5) What are the salient features of Arabidopsis thaliana ?
6) What are the practical application of Gibberellins ?

3. A) Answer **any two** of the following : **6**

1) What are different kinds of embryo development in dicotyledon ?
2) Flower patterning.
3) Sporophytic self incompatibility.

B) Explain the process of fertilization in Angiosperms. **4**

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

   1) Write on vectors involved in pollination.

   2) What is apomixis and give detail account on it ?

   3) Give general account Abscisic acid, with its practical application.

5. Answer **any two** of the following : **10**

   1) Development of male gametophyte.

   2) Short note on cell wall formation in plants.

   3) What is polyembryony and give detail account on it ?

SLR-CX – 48

Seat No.	

B.Sc. – III (Biotechnology) (Semester – V) (Old) Examination, 2017
ANIMAL DEVELOPMENT

Time : 2 Hours | Total Marks : 50

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

*2) Draw **neat** and labeled, diagrams **wherever** necessary.*

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

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

1) Germplasm theory was proposed by _____

a) Weismann b) Roux

c) Driesh d) Child

2) Spemann proposed _____ theory of development.

a) Mosaic b) Regulative

c) Gradient d) Organizers

3) From 10 spermatogonial cells _____ number of sperms are produced.

a) 10 b) 5 c) 20 d) 40

4) _____ is known as ovulation hormone.

a) FSH b) LH c) ICSH d) GH

5) Fusion of male and female pronucleus is called as _____

a) Amplexus b) Amphimixis

c) Homogenization d) Mixing

6) Holoblastic cleavage is called as _____

a) Incomplete b) Partially complete

c) Complete d) None of these

7) Insect egg is an example of _____

a) Centrolecithal b) Telolecithal

c) Mesolecithal d) Microlecithal

8) According to Gilchrist (1968), the prospective endodermal zone is called _____

a) Zone of involution b) Zone of invagination

c) Zone of expansion d) All of these

9) The development of an egg without fertilization _____

a) Parthenogenesis b) Syngamy

c) Embryogeny d) None of these

10) The larval form transform into the adult form is called _____

a) Metastasis b) Morphogenesis

c) Metamorphosis d) Organogenesis

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

i) What is Baer's law ?

ii) What are aging ?

iii) Give mechanism of semination in mammals.

iv) Write a note regulation of ovulation.

v) Draw a neat labeled diagram of Graffian follicle.

vi) Write a note on planes of cleavage.

vii) Structure of frog blastula.

3. A) Answer on **any two** the following : **6**

   i) Describe process of spermatogenesis.

   ii) Describe types of cleavage.

   iii) Describe Blastulation in centrolecithal egg with suitable example.

   B) Describe regeneration in invertebrates with suitable example. **4**

4. Answer on **any two** the following : **10**

   i) Describe different patterns of cleavage.

   ii) Describe process of fertilization with neat labeled diagram.

   iii) Describe process of gastrulation in chick with neat labeled diagram.

5. Answer on **any two** the following : **10**

   i) Describe embryonic adaptations in Amphioxus and frog.

   ii) Explain process of oogenesis with neat labeled diagram.

   iii) Describe types of asexual reproduction with suitable examples.

SLR-CX – 49

Seat No.	

B.Sc. (Biotechnology) (Part – III) (Semester – V) (Old) Examination, 2017
BIOINFORMATICS AND NANOTECHNOLOGY

Time : 2 Hours | Total Marks : 50

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

1. Rewrite the sentences using **correct** alternative given below. **10**

1) To obtain the thin films without changing the composition of original material, the _____ technique is used.
   a) Laser ablation
   b) Sputter deposition
   c) Electric arc discharge
   d) Electrochemical etching

2) The uncertaincy principle about position and momentum of particles was proposed by _____
   a) Robert Brown
   b) Schrödinger
   c) Heisenberg
   d) Max Planck

3) 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

4) The suitably modified polymeric nanoparticles in the form of _____ loaded with drugs are able to pass the blood brain barrier.
   a) Liposomes
   b) Fullerenes
   c) Quantum dots
   d) Nanotubes

5) The term nano was first coined by _____
   a) Alexander Fleming
   b) John Tyndall
   c) Richard Fynmann
   d) Rutherford

P.T.O.

6) SWISS-PROT represents _____ database.

a) Nucleic acid sequence b) Protein sequence

c) Genome sequence d) Cancer chromosome

7) FASTA algorithm was described by _____

a) Altschul b) Lipman and Pearson

c) Wunch d) Smith-Waterman

8) The structural database of nucleic acid is _____

a) PDB b) NRL-3D

c) GenBank d) NDB

9) OWL is _____ database.

a) Redundant b) Unverified

c) Unannotated d) Composite

10) The study of complete genome of organism is known as _____

a) Proteomics b) Metagenomics

c) Genomics d) Pharmacology

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

1) What is consensus sequence ? Give example.

2) What is quantum mechanics ?

3) What are different sizes of matter ? How much is a nano size ?

4) What is phylogeny ?

5) Write about BLOSUM matrices.

6) Differentiate between top down and bottom up approach of nano-synthesis.

7) What is MMDB ?

3. A) Answer **any two** of the following : **6**

   1) Write about 'evolutionary basis for sequence analysis'.

   2) How prediction of function of unknown genes can be done by bioinformatics tools ?

   3) Write about polymerization of nanomaterials with an example.

   B) Describe the role of nanomaterials in drug delivery. **4**

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

   1) Explain multiple sequence alignment using Clustal X.

   2) Explain in detail structure classification databases.

   3) Explain the types of BLAST.

5. Answer **any two** of the following : **10**

   1) Illustrate different methods of nanomaterial synthesis.

   2) Describe the tools used to measure nanostructures.

   3) Add a note on quantum idea and quantum mechanics.

SLR-CX – 50

Seat No.	

B.Sc. (Part – III) (Semester – V) (Old) Examination, 2017
BIOTECHNOLOGY
Recent Trends in Biotechnology

Time : 2 Hours | Total Marks : 50

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 : **10**

i) Biotransformation means conversion of _____ compounds to more hydrophilic metabolites.

a) Halophitic b) Lipophilic
c) Aromatic d) Aliphatic

ii) Phase II reaction does not involve _____ type of reaction.

a) Conjugation b) Synthetic reaction
c) Ligation d) Oxidation and reduction

iii) _____ Mutagenesis method is used if the segment of gene to be mutated lies between two closed spaced, unique, restriction enzyme cleavage sites.

a) Random chemical b) Cassette
c) PCR directed d) Primer extension

iv) The enzyme _____ catalyzes a one -step stereospecific addition of ammonia to the double bond of fumaric acid.

a) Endonuclease b) Aspartase
c) Ligase d) Lipase

v) _____ method is used for immobilization of cells.

a) Entrapment b) Cross linking
c) Covalent binding d) Occlusion

P.T.O.

vi) Conversion of environmental pollutants into the harmless forms through the innate capabilities of naturally occurring microbial population is called _____

a) Phytoremediation
b) Extrinsic bioremediation
c) Ex-situ bioremediation
d) Intrinsic bioremediation

vii) Traditional direct testing of toxicants is involved in _____ Toxicology.

a) Descriptive
b) regulatory
c) Mechanistic
d) Principle

viii) Largest gene in human in is_____

a) Hexokinase
b) Phosphofructokinase
c) Dystrophin
d) Insulin

ix) _____ method is used to treat contaminated soil by using plants.

a) Phytoremediation
b) Ex-situ bioremediation
c) Intrinsic bioremediation
d) None of the above

x) Modification of metabolic pathway by using knowledge from computer science, cell biology, biochemistry, molecular biology is _____

a) Protein engineering
b) Solvent engineering
c) Metabolic engineering
d) Chemical engineering

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

a) State the function of glucose isomerase.

b) Define bioaugmentation.

c) Explain phytosequestration.

d) Distinguish between degradable and non degradable toxic substances.

e) What is Xenobiotics ?

f) Define bioethics.

g) What is solvent engineering ?

3. A) Answer **any two** of the following : **6**

   a) Give an account on ethics involved in human genome project.

   b) Explain the biotransformation of toxicants in liver.

   c) Discuss on metabolic control analysis.

   B) Write down the characteristics of carrier and support material used for immobilization of enzymes. **4**

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

   a) Explain any three methods of enzyme immobilization.

   b) Write a note on principle and strategies of metabolic engineering.

   c) Explain various processes of phytoremediation technology for soil decontamination.

5. Answer **any two** of the following : **10**

   a) What is bioremediation ? Add a note on *In situ* bioremediation.

   b) Write a note on ethics in involved in stem cell research.

   c) What are the hazardous effects of Xenobiotics when entered in the body through inhalation and skin ?

SLR-CX – 51

Seat No.	

B.Sc. – III (Biotechnology) (Semester – VI) (New-CGPA) Examination, 2017
ENGLISH (Compulsory)
Breakthrough

Time : 2.30 Hours Max. Marks : 70

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

1. A) Choose the correct alternative : **10**

1) Who said "Hello, old chap, you got to work, hey" ?
   a) Jim b) Ben Rogers
   c) Tom d) Billy Fisher

2) Tom promises Jim to give _____ in exchange of whitewashing the fence.
   a) a jews-harp b) a tin soldier
   c) a white alley d) a spool cannon

3) Mathilde does not want to go to the palace at the Ministry for party because _____
   a) she has no friends
   b) she has no car to go by
   c) she has no fancy clothes and jewels to wear
   d) she is too tired to go

4) Loisel gave Mathilde _____ to buy a petty dress for the party.
   a) four hundred francs b) three hundred francs
   c) five hundred francs d) six hundred francs

5) Pyramus and Thisbe live resided in _____
   a) Rome b) Greece c) Sidon d) Babylonia

6) How did Pyramus and Thisbe communicate ?
   a) through a crack in the wall
   b) by whispering through the windows
   c) standing outside
   d) via letters and notes

7) What do maidens grind ?
   a) ginger, rosewood, turmeric b) sandalwood, henna, spice
   c) beetroot, chilly, mustard d) potatoes, tomatoes, wheat

8) What do magicians chant ?
   a) notes into paper b) plate into spoon
   c) gold into copper d) spells for the aeons to come

9) *Teach me a better strain, a nobler lay,*
   O Thou, enthroned with _____ in the realms of day!
   a) Cherubs b) God c) Queen d) Virtue

10) According to poet Phillis Wheatley, wisdom is higher than _____ can reach.
   a) an angel b) a fool c) a wise d) a man

B) Do as directed : **4**

1) My e-mail to Rita bounced back. (Make it a compound sentence)
2) Take care of the pence and the pounds will take care of themselves. (Change into a complex sentence)
3) She has been cooking all day. (Add a question tag)
4) This is the house. Sachin was born here. (Combine these sentences using relative adverb)

2. Answer **any seven** of the following questions in short. **14**

1) Compare the myth of Pyramus and Thisbe to Shakespeare's '*Romeo and Juliet*'.
2) Do you think that Pyramus, and Thisbe are star-crossed lovers ? Justify your answer.
3) What action does Pyramus perform when he thinks Thisbe is dead ?
4) Does the story '*The Necklace*' have a moral ? What is it ?
5) Do you think that the course of action the Loisels chose after the loss of the necklace was right ? What other choices were open to them ?
6) Comment briefly on the title of the story The Necklace.
7) Describe the character of Tom in '*Whitewashing the Fence*'.
8) What did Tom's friends do when they saw him painting the fence ?

3. A) Answer **any two** of the following : **8**

   1) Compare the bazaar described in the poem '*In the Bazaars of Hyderabad*' with today's shopping malls. What differences do you find between them ?

   2) What is the central idea of the poem '*On Virtue*' ?

   3) What is your own conception of heaven ? How, according to you, can we attain the kingdom of heaven ?

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

   1) Describe the strategies for managing the work stress with a suitable example.

   2) Write an example of a problem you have faced in the past. How did you solve it ?

   3) Write about the biggest change that you had to deal with. How did you adapt to that change ?

4. Imagine that you are walking through a lovely, dark and deep forest. Write a detailed description of the forest. **14**

   OR

   Imagine that you are travelling by rail and you come across two orphan girls begging in the rail. Write an imaginative story of these two begging girls.

5. Read the following passage and write the summary of it. **14**

   Elimination of illiteracy has been one of the major concerns of our government since Independence. Illiteracy is a serious obstacle to the establishment of a social order based on equality. It withholds the development of the individual, society and the nation.

   The position of our country as compared to that of vie literacy today is 90^{th} in the world of the present trend continues, then we would be entering the twenty-first century with 55 crore illiterate-55 per cent of the total illiterates in the world or in other words, India would have a larger body of illiterate people than any other country in the world.

   It was targeted to achieve 100 per cent literacy amongst those in the 15-35 age group during the Eighth Plan. This means that 10 crore additional people were to be educated. The Planning Commission in its approach paper to the Ninth Plan stated, keeping in view the declaration of education as a fundamental right, that making the nation fully literate by the year 2005 will be the committed goal.

   The Hon. Prime Minister had put forward a suggestion that every student should impart literacy to five persons, including two girls to be able to qualify for the senior school certificates at the end of the plus-two course.

SLR-CX – 52

Seat No.	

B.Sc. (Biotechnology) (Part– III) (Semester – VI) (New CGPA) Examination, 2017
TOOLS AND TECHNIQUES

Time : 2.30 Hours | Total Marks : 70

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

1. Rewrite the sentence using **correct** alternative given below. **14**

1) Type-II restriction endonuclease are most commonly used in _____ technique.
   a) PCR b) RFLP
   c) Western blotting d) Ligation

2) _____ is a self replicating entity used as a vector is gene transfer technique.
   a) Plasmid b) Virus
   c) Bacteriophage d) Probe

3) Insert size of 400-450 Kb can be incorporated in a_____
   a) Cosmid b) Virus
   c) Plasmid d) YAC

4) Maxam Gilbert method is used for sequencing of_____
   a) RNA b) DNA
   c) Protein d) Other bimolecules

5) c DNA library is prepared from _____
   a) r-RNA b) t-RNA
   c) m-RNA d) Sn-RNA

P.T.O.

6) In genetic engineering a probe is used for _____
   a) Cloning
   b) Screening
   c) Cleaving
   d) Recombinant DNA

7) Nitrocellulose membrane is mostly used in _____ techniques.
   a) Chromatographic
   b) Paper electrophoresis
   c) Blotting
   d) Reporter gene assay

8) Restriction enzymes cleave the DNA at _____ sites.
   a) Nicks
   b) Single strand
   c) Palindromic
   d) Ends

9) Taq DNA polymerase is a _____ enzyme used in PCR,
   a) Thermolabile
   b) Thermostable
   c) Halophilic
   d) Halophobic

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

11) _____ is a technique in which Minisatellite sequences are used for analysis.
   a) DNA fingerprinting
   b) Dot blot
   c) Autoradiography
   d) DNA hybridization

12) A _____ is a short or long length of ssRNA or DNA.
   a) Nucleic acid
   b) Isotope
   c) c DNA
   d) Probe

13) A rapid method of amplifying a length of target DNA is _____ by.
   a) PCR
   b) Transformation
   c) Labeling
   d) Transfection

14) PBR322 is a _____
   a) Cosmid
   b) Natural plasmid
   c) Constructed plasmid
   d) Phagemid

2. Answer **any seve**n of the following : **14**

   i) Discuss the role of reverse transcriptase enzyme.

   ii) Give the significance of transfection technique.

   iii) Write a note on the properties of an ideal vector.

   iv) Explain chromosome walking.

   v) Describe the technique of particle bombardment.

   vi) Explain the principle of autoradiography.

   vii) Explain the role of taq DNA polymerase.

   viii) Give all the characteristics of a plasmid vector.

   ix) Give the applications of c DNA library.

3. A) Write the short answers to **(any two)** : **10**

      i) Explain the technique of electrophoresis and add a note on its applications.

      ii) Explain insertional inactivation.

      iii) Discuss the technique of Agrobacterium mediated gene transfer technique.

   B) Write a note on Maxam and Gilbert's method of DNA sequencing. **4**

4. Write short notes on **any two** of the following : **14**

   i) Write a note on scope of genetic engineering.

   ii) Describe in detail different types of PCR.

   iii) Explain the role of Shuttle vectors.

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

   i) Discuss the role of nucleic acid modifying enzymes.

   ii) Describe the various methods of Blotting.

   iii) What is cloning ? Explain cloning from genomic DNA.

SLR-CX – 53

Seat No.	

B.Sc. – III (Biotechnology) (Semester – VI) (New CGPA) Examination, 2017
APPLICATIONS

Time : 2.30 Hours | Total 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) _____ 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 hybridisation.
   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 protein 2
   b) Capsid viral protein 3
   c) Capsid viral protein 1
   d) Capsid viral protein 4

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(subgroup) is _____
   a) Flat irregular
   b) Cuboidal
   c) Bipyramidal
   d) Irregular

10) _____ portion is 3000 times sweeter than sucrose.
   a) Morphine
   b) Monellin
   c) Casein
   d) BSA

11) _____ genera found to undergo biofix a wide range of xenobiotics chemicals.
   a) Protozoan
   b) Fungal
   c) Bacterial
   d) Yeast

12) Molecular weight of human growth hormone is _____ Dalton.
   a) 22,000
   b) 22,325
   c) 22,250
   d) 22,125

13) _____ antisense oligonucleotides have been shown to be effective in vivo in mice.
   a) Phosphoramidate
   b) Phosphorothioate
   c) Polyamide
   d) Propynyl cytosine

14) RNA interference in animals appears to be related to _____
   a) RNAi
   b) Gene Silencing
   c) Co suppression
   d) Gene Knockout

2. Answer the following **(Any seven)** : **14**
   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.
   7) Enlist the applications of transgenic animals.
   8) Write a short note on xenobiotics.
   9) Write a note on gene therapy for cystic fibrosis.

3. A) Answer the following **(Any two)** : **10**
      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)** : **14**
   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)** : **14**
   1) Discuss engineering of xanthomonas for xanthan gum production.
   2) Explain in detail transgenic sheep.
   3) Describe genetic engineering of biodegradative pathway by gene alteration.

SLR-CX – 54

Seat No.	

B.Sc. – III (Semester – VI) (New CGPA) Examination, 2017
BIOTECHNOLOGY
Fermentation Technology

Time : 2.30 Hours Total Marks : 70

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

1. Rewrite the sentence by choosing **correct** alternative given below. **14**

i) Industrial production of amylase by submerged culture is done by using _____

a) Aspergillus niger
b) E.coli
c) Saccharomyces cerevisiae
d) Bacillus subtilis

ii) Phenyl acetic acid is used as precursor in the production of _____

a) Penicillin G
b) Penicillin V
c) L-isoleucine
d) Vitamin B_{12}

iii) Stock culture of micro organisms is maintained by _____

a) Tyndallization
b) Sterilization
c) Lyophilization
d) Pasteurization

iv) Enzymatic assay is example of _____ type of assay.

a) Physical-chemical
b) Biological
c) Diffusion
d) None of these

v) In ethanol production _____ can used as fermentation medium.

a) Corn steep liquor
b) Sulphite waste liquor
c) Molasses
d) All of these

vi) Heat labile fermentation products are separated by using _____

a) Centrifugation
b) Filtration
c) Cell disruption
d) Crystallization

P.T.O.

vii) Primary screening of organic acid producer carried by adding _____ in nutrient agar.

a) pH indicator dye
b) Calcium carbonate
c) Both of these
d) None of these

viii) β – hydroxy valeric acid is base analogue of_____

a) Threonine
b) Lysine
c) L-alanine
d) Glutamic acid

ix) _____ technique is used in screening for antibiotic producing microorganism.

a) Giant colony
b) Crowded plate
c) pH indicator dye
d) None of these

x) Acetone-butanol fermentation is example of _____ fermentation.

a) Surface
b) Submerged
c) Aerobic
d) Anaerobic

xi) The production of substances in industrial microbiology occur in the sequence _____

a) Fermentation, downstream processing, removal of waste, inoculation
b) Inoculation, downstream processing, fermentation, removal of waste
c) Inoculation, fermentation, downstream processing, removal of waste
d) Removal of waste, inoculation, fermentation, downstream processing

xii) Primary metabolites are synthesised in _____ phase of growth.

a) Log
b) Lag
c) Stationary
d) Death

xiii) _____ is nonmechanical method of cell disruption.

a) Liquid shear
b) Alkali treatment
c) Ultrasonication
d) Solid shear

xiv) Lard oil is example of _____ antifoam agent.

a) Organic
b) Inorganic
c) In ert
d) None of these

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

   i) Turbidometric assay.

   ii) Strain improvement methods.

   iii) Scale-up of fermentation.

   iv) Characteristics of an ideal fermentor.

   v) Recovery of citric acid.

   vi) Crowded plate technique.

   vii) Crude media and synthetic media with examples.

   viii) Agitation and aeration.

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

      i) Secondary screening.

      ii) Describe in detail the inoculum preparation.

      iii) Fermentation economics.

   B) Write an account on different methods of centrifugation used for purification of fermentation broth. **4**

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

   i) Application of computer in fermentation technology.

   ii) Basic design and function of bioreactor.

   iii) Explain strain improvement by different methods.

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

   i) Write an assay on ethanol fermentation.

   ii) Different methods of cell disruption.

   iii) Production of bioinsecticide.

SLR-CX – 55

Seat No.	

B.Sc. – III (Semester – VI) (Biotechnology) (New CGPA) Examination, 2017
FOOD AND DAIRY TECHNOLOGY

Time : 2.30 Hours | Total Marks : 70

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

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

i) Halophilic species of Lactibacillus and Leuconostoc ferment cabbage to produce _____

a) Cheese b) Yoghurt
c) Sauerkraut d) Bread

ii) Drying is used to reduce _____

a) pH b) Moisture
c) Nutrients d) Carbohydrates

iii) _____ has been called the 'Father of Canning'.

a) Robert Hook b) Pasteur
c) Nicolas Appert d) Tyndall

iv) The major carriers of Salmonellosis are _____

a) Meat and eggs b) Fruits
c) Sugar d) Cereals

v) _____ is the procedure followed when a deviation occurs in critical limit from CCP.

a) Deviation b) Hazard
c) Corrective action d) Validation

P.T.O.

vi) _____ is the milk sugar.

a) Lactose
b) Mannose
c) Glucose
d) Maltose

vii) Indian pickles are preserved due to _____

a) Hypertonic condition
b) Hypotonic condition
c) Isotonic condition
d) Isoelectric point

viii) _____ radiations are ionizing type of radiations used for preservation of food after packaging also.

a) Alpha
b) Beta
c) Gamma
d) UV

ix) Failure to meet required critical limit for a Critical Control Point is called _____

a) Deviation
b) Corrective action
c) Verification
d) Validation

x) *Acetobacter aceti* oxidizes the alcohol to produce_____

a) Acetic acid
b) Citric acid
c) Benzoic acid
d) Propionic acid

xi) _____ is not the extrinsic parameter of food responsible for microbial growth.

a) pH
b) Temperature of storage
c) Relative humidity of environment
d) Presence of gases in environment

xii) _____ is microbial indicator of fecal pollution.

a) P.aeroginosa
b) S.typhi
c) E.coli
d) B.subtilis

xiii) Quality of milk determined using _____

a) MBRT test
b) Resazurin test
c) Both of these
d) None of these

xiv) Radiation of UV at _____ nm wavelength is most germicidal.

a) 250
b) 260
c) 280
d) 300

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

   i) Toxins.

   ii) Fecal contamination.

   iii) Food hazard.

   iv) Milk.

   v) Perishable food.

   vi) Radiation.

   vii) Quality control.

   viii) Stand plate count.

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

      i) Explain methods of microorganisms counting.

      ii) Explain microbial spoilage of fish and sea products.

      iii) Explain sources of microbes, equipment cleaning and disinfection in food industry.

   B) Define pasteurization and explain methods of pasteurization. **4**

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

   i) Explain the production, spoilage, preservation and nutritional value of Beer.

   ii) Explain Hazard Analysis and Critical Control Points (HACCP) system in detail.

   iii) Explain microbial spoilage of vegetable and fruits.

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

   i) Explain the production, spoilage, preservation and nutritional value of Bread.

   ii) Explain methods and role of genetic and immunological techniques used in identification of microbes and toxins in food industry.

   iii) Explain MBRT, Resazurin and Phosphatase test in detail.

SLR-CX – 56

Seat No.	

B.Sc. – III (Semester – VI) (Old) (Biotechnology) Examination, 2017
ENGLISH (Compulsory)
Breakthrough

Time : 2 Hours | Total Marks : 50

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

1. Choose the correct alternative : **10**

1) A great law of human action that Tom discovered to make a person covet a thing was _____

a) To make the thing easy to do

b) To make the thing difficult to attain

c) To make the thing simple to attain

d) To neglect the thing

2) The new diamond necklace that Loisel bought to give it to Mme Forester was priced _____

a) Forty thousand francs b) Thirty four thousand francs

c) Thirty-six thousand francs d) Five hundred francs

3) Pyramus saw in the sand the footsteps of the _____

a) Tiger b) Wolf

c) Fox d) Lion

4) Pyramus and Thisbe decided to meet at the foot of a _____

a) White mulberry tree b) Purple mulberry tree

c) Green mulberry tree d) Pink mulberry tree

5) In the poem 'In the Bazaars of Hyderabad' the goldsmith makes girdles of gold for _____

a) Musicians b) Dancers

c) Kings d) Maidens

6) According to Phillis Wheatley, _____ is higher than a fool can reach.

a) Knowledge b) Wealth

c) Wisdom d) Glory

7) The tag question for the sentence "Everyone is asleep" is _____

a) Isn't he ? b) Isn't it ?

c) Aren't they ? d) Isn't they ?

8) "What you did helped us." The underlined clause is _____

a) Adverbial clause b) Adjectival clause

c) Relative clause d) Noun clause

9) "No sooner did it stop raining than Mohit left for work." This sentence is a _____

a) Simple sentence b) Complex sentence

c) Compound sentence d) None of these

10) "I met the woman you spoke to." The underlined clause is _____

a) A noun clause b) A relative clause

c) An adverbial clause d) An adjectival clause

2. Answer **any five** of the following questions in brief : **10**

1) How did Tom react after surveying the fence ?

2) What did Mathilde and Loisel do to pay the debt ?

3) Why did Thisbe end her life ?

4) According to classical mythology, why are mulberries purple in colour ?

5) What is the end of the story the Necklace ?

6) What did Tom acquire at the end of the day ?

3. A) Answer **any two** of the following : **6**
   1) What is the theme of the poem "In the Bazaars of Hyderabad " ?
   2) What is the speaker's attitude to life on earth in the poem On Virtue ?
   3) Who will buy the things the goldsmiths make ?

   B) Answer **any two** of the following in brief : **4**
   1) Make a list of four ways in which you usually waste your time. How can you manage your time better ?
   2) Mahesh is a young Maharashtrian man working in a multinational company as a sales manager. He has recently been transferred to Kolkata. He is unfamiliar with the city and its weather, people, food, language and culture. Suggest ways in which Mahesh can successfully adapt himself to the new environment where he has to live and work.
   3) You are working as a bank manager in a private commercial bank. You have been given the target which you are unable to fulfill. You work overnight and could not sleep. You become irritable and tense. What would you do to reduce your stress ?

4. Answer **any one** of the following : **10**
   1) Write in detail the description of a cricket player you like most. Give the traits of his personality.
   2) Describe in detail your trip to North India.

5. Read the following passage and summarise it : **10**

   It is very easy to acquire bad habits, such as eating too many sweets or too much food, or drinking too much fluid of any kind, or smoking. The more we do a thing, the more we tend to like doing it ; and if we do not continue to do it, we feel unhappy. This is called the force of habit and the force of habit should be fought against.

   Things which may be very good when only done from time to time, tend to become very harmful when done too often and too much. This applies even to such good things as work or rest. Some people form a bad habit of working too much and others of idling too much. The wise man always remembers that this is true about himself and checks any bad habit. He says to himself, "I am now becoming idle," or "I like too many sweets," or "I smoke too much" and then adds, "I will get myself out of this bad habit at once."

One of the most widely spread of bad habits is the use of tobacco. Tobacco is now smoked or chewed by men, often by women and even by children, almost all over the world. It was brought into Europe from America by Sir Walter Raleigh, four centuries ago and has hence spread everywhere. I very much doubt whether there is any good in the habit, even when tobacco is not used excess; and it is extermely difficult to get rid of the habit when once it has been formed.

Alcohol is taken in almost all cool and cold climates and to a very much less extent in hot ones. Thus, it is taken by people who live in the Himalaya Mountains, but not nearly so much by those who live in the plains of India. Alcohol is not necessary in any way to anybody. Millions of people are beginning to do without it entirely : and once the United States of America have passed laws which forbid its manufacture or sale through out the length and breadth of their vast country. In Indian it is not required by the people at all and should be avoided by them altogether. The regular use of alcohol, even in small quantities, tends to cause mischief in many ways to various organs of the body. It affects the liver; it weakens the mental powers and lessens the general energy of the body.

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SLR-CX – 57

Seat No.	

B.Sc. – III (Semester – VI) (Old) Examination, 2017
BIOTECHNOLOGY
Genetic Engineering : Tools and Techniques – I

Time : 2 Hours | Total 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) _____ is the region where DNA replication is initiated.

a) tra
b) colEI
c) Ori
d) nif

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) A _____ is a short or long length of ssRNA or DNA.

a) Nucleic acid
b) Isotope
c) cDNA
d) Probe

5) C-DNA library is prepared from _____

a) r-RNA
b) t-RNA
c) m-RNA
d) Sn-RNA

P.T.O.

6) pBR322 is a _____

a) Cosmid b) Natural plasmid
c) Constructed plasmid d) Phagemid

7) _____ is used in agarose gel electroporetic techniques.

a) Cellulose b) Cellulose acetate
c) Agarose d) Agar

8) In blotting techniques nucleic acids are transferred to the _____ membrane.

a) Cell b) Cellulose
c) Nitrocellulose d) None of these

9) _____ is the thermostable enzyme used in PCR.

a) DNA Polymerase b) Taq DNA Polymerase
c) Maq DNA Polymerase d) DNA Ligase

10) _____ enzyme introduces nicks in nick translation in a duplex DNA molecule.

a) DNA ligase b) DNA polymerase I
c) DNAse I d) DNA polymerase III

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

i) What is chromosome walking ?
ii) Explain Dot Blot technique.
iii) Explain role of DNA modifying enzymes in cloning.
iv) Write a note on basic properties of a vector.
v) Explain autoradiography.
vi) Discuss the role of APS and TEMED.

3. A) Answer **any two** of the following : **6**

i) Describe the mechanism of Agrobacterium mediated gene transfer.
ii) Explain the technique of electrophoresis and add a note on its applications.
iii) Explain the technique of RFLP.

B) What are cloning vectors ? Describe the Cosmids and Shuttle vectors. **4**

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

   i) Discuss the role of nucleic acid modifying enzymes.

   ii) Write an account on sequencing of genes.

   iii) Write down the role of animal viruses as vectors.

5. Answer **any two** of the following : **10**

   i) Write a note on scope of genetic engineering.

   ii) Describe the technique of PCR. Write its applications.

   iii) What is cloning ? What are the different strategies of cloning ?

SLR-CX – 58

Seat No.	

B.Sc. – III (Biotechnology) (Semester – VI) (Old) Examination, 2017
GENETIC ENGINEERING : APPLICATIONS – II

Time : 2 Hours Total Marks : 50

***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. **10**

1) _____ compounds are chemicals which are foreign to the biosphere.

a) Xenobiotic b) Transgenic
c) Gaseous d) Fluid

2) A microbial population growing on one compound may transform a contaminating chemical that can not be used as a 'C' source, process is known as _____

a) α metabolism b) Co-metabolism
c) β metabolism d) Metabolism

3) Interferon α and β are synthesized in cells that have been exposed _____

a) Bacteria b) Fungus
c) Viruses d) Protozons

4) _____ is the second generation of rDNA technology.

a) Engineering b) Lipids Engineering
c) Metallergy d) Protein Engineering

P.T.O.

5) _____ must bind to a specified mRNA and prevent translation of the protein.

a) Antisense RNA b) Antisense DNA
c) DNA d) RNA

6) The addition of _____ to animal cell reduces the expression of the gene from which double stranded RNA sequence is derived.

a) Ds DNA b) Ds RNA
c) Ss DNA d) Ss RNA

7) Subunit vaccine for cholera is prepared by _____ epitope.

a) Cholera toxin C subunit b) Cholera toxin A subunit
c) Cholera toxin B subunit d) Cholera toxin D subunit

8) Genetically engineered *X. Campestris* was grow on whey due to Insertion of _____ gene.

a) *Bacillus* lac ZY b) *E. coli* lac ZY
c) *Fungus* lac ZY d) *Pseudomonas* lac ZY

9) Crystal shape of CRY I A (a) is _____

a) Bipyradimal b) Cuboidal
c) Flat 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 Xenobiotics.

2) Explain antisense RNA.

3) Write a note on increase in enzyme activity.

4) Explain attenuated vaccine.

5) Explain in brief vaccines against bacteria.

6) Write a note on Interfering RNA.

3. A) Answer the following (**Any two**) : **6**

   1) How will you increase enzyme stability by genetic engineering ?

   2) Explain cloning livestock by nuclear transfer.

   3) Write a note on synthesis of human growth hormone.

   B) Explain synthesis of human interferon. **4**

4. Answer the following (**Any two**) : **10**

   1) Explain development of senescence tolerant plants.

   2) Describe Microbial degradation of xenobiotics.

   3) Discuss vector vaccines directed against viruses.

5. Answer the following (**Any two**) : **10**

   1) Discuss in detail development of herbicide resistant plants.

   2) Describe in detail subunit vaccines against FMD.

   3) Give details of transgenic mice.

SLR-CX – 59

Seat No.	

B.Sc. – III (Semester – VI) (Biotechnology) (Old) Examination, 2017
MICROBIAL BIOTECHNOLOGY
Fermentation Technology – I

Time : 2 Hours | Total Marks : 50

***N.B.** : 1) **All** questions are **compulsory**.*

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

1. Rewrite the sentences using **correct** alternative given below. **10**

i) Head space at the top of fermentor allows liquid medium for _____

a) Splashing b) Foaming

c) Aeration d) All of these

ii) Primary screening of organic acid producer carried by _____ in nutrient agar.

a) Addition of calcium carbonate b) Addition of antibiotic

c) Addition of pH indicator d) None of these

iii) Secondary metabolites are _____

a) Essential to microbe function

b) By-products of metabolism that are not important to microbe function

c) Harvested during exponential phase of growth

d) None of these

iv) Corn steep liquor is example _____ media.

a) Crude b) Synthetic

c) Semisynthetic d) None of these

v) _____ nonmechanical method of cell disruption.

a) Alkali treatment b) Liquid shear

c) Solid shear d) Ultrasonication

vi) Cell number or biomass of batch culture exhibits curve of _____

a) J shape b) C-shape

c) S (Sigmoid) d) None of these

vii) Heat labile products are separated by _____

a) Filtration b) Centrifugation

c) Cell disruption d) None of these

viii) Industrial production of citric acid is carried out by _____

a) Saccharomyces cerevisiae b) Penicillium notatum

c) Aspergillus niger d) Penicillium chrysogenum

ix) α-amino β-hydroxyvaleric acid is an analogue of _____ amino acid.

a) Lysine b) Threonine

c) Arginine d) None of these

x) End point determination assays are used for estimation of _____

a) Antibiotic b) Vitamins

c) Amino acids d) Organic amines

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

i) Raw materials used for fermentation media.

ii) Define primary and secondary screening.

iii) Give different methods used for preservation of industrially important strains.

iv) Give any two names of microbial culture collection centres.

v) Give different methods used for strain improvement.

vi) Write general characteristics of production strain.

3. A) Answer **any two** of the following : **6**

   i) Industrial production of bioinsecticide.

   ii) Methods of cell disruption.

   iii) Secondary screening.

   B) Write an essay on filtration and centrifugation used for product recovery. **4**

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

   i) Define assay, give an account on physical-chemical and biological assays.

   ii) Write an essay on ethanol fermentation.

   iii) Give structure and function of bioreactor and its various components.

5. Answer **any two** of the following : **10**

   i) Write an account on application of computer in fermentation Technology.

   ii) Write an account on batch and continuous fermentation.

   iii) Scale up of fermentation.

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SLR-CX – 60

Seat No.	

B.Sc. – III (Semester – VI) (Biotechnology) (Old) Examination, 2017
MICROBIAL BIOTECHNOLOGY : FOOD AND DAIRY TECHNOLOGY – II

Time : 2 Hours Total Marks : 50

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

1. Choose the **correct** alternative and rewrite the sentences again. **10**

i) _____ has been called the 'Father of Canning'.

a) Robert Hook b) Pasteur
c) Nicolas Appert d) Tyndall

ii) Food additive Sodium benzoate is most effective at _____ pH.

a) 2.5 to 4 b) 5 to 7
c) 8 to 9 d) 10 to 12

iii) _____ is the milk sugar.

a) Lactose b) Mannose
c) Glucose d) Maltose

iv) In the cheese production casein is coagulated using _____

a) Milk b) Protease
c) Rennet d) Whey

v) _____ is microbial indicator of fecal pollution.

a) *P. aeroginosa* b) *S. typhi*
c) *E. coli* d) *B. subtilis*

P.T.O.

vi) DNA/RNA hybridization methods are used to detect the presence of _____ in food.

a) Flavors b) Chemicals

c) Toxins d) Microbes

vii) Unacceptable contamination, microbial growth, toxins, enzymes responsible for food spoilage is microbial _____

a) Severity b) Monitoring

c) Hazard d) Quality

viii) In quality control microbial examination of finished product as well as ingredients, products in process, equipments, environment and personnel is known as

a) Control at source b) Hazard

c) Criteria d) Quality

ix) In Standard Plate Count (SPC) of pasteurized milk plates are incubated at _____ temperature.

a) Low b) Moderate

c) Higher d) All of these

x) Radiation of UV at _____ nm wavelength are most germicidal.

a) 250 b) 260 c) 280 d) 300

2. Answer **any five** of the given below. **10**

i) What is indicator organism ? Give its significance.

ii) Explain Stand plate count method.

iii) Explain role of record keeping in quality control.

iv) Enlist the dairy products.

v) What is perishable food ? Give its examples.

vi) Explain role of removal of microbes in food preservation.

3. A) Answer **any two** of the following : **6**

   i) Explain genetic and immunological methods used for determination of food spoilage by toxins and microbes.

   ii) Explain microbial spoilage of eggs and poultry products.

   iii) Explain quality systems with examples.

   B) Define pasteurization and explain methods of pasteurization. **4**

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

   i) Explain Hazard Analysis and Critical Control Points (CACCP) system in detail.

   ii) Explain the production, spoilage, preservation and nutritional value of Cheese.

   iii) Explain microbial spoilage of vegetable and fruits.

5. Answer **any two** of the following. **10**

   i) Explain dye reduction tests in detail with its significance.

   ii) Explain the production, spoilage, preservation and nutritional value of Vinegar.

   iii) Explain the general methods of food preservation.
