SLR-M – 1

Seat No.	

B.Sc. – I (Semester – I) (Biotechnology) Examination, 2015
ENGLISH COMPULSORY (CGPA Pattern)

Day and Date : Wednesday, 1-4-2015 Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

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

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

1) What did the policeman look like ?
   a) Uniformed and frail and short
   b) Uniformed and well-built
   c) Dressed in ordinary clothes and frail and short
   d) Dressed in ordinary clothes and well-built

2) When the writer invited her to stay with her for a while, Miss Krishna agreed _____
   a) Reluctantly b) Shyly
   c) Readily d) With little enthusiasm

3) The name of the psychologist who developed the IQ test was _____
   a) Dr. Sigmund Freud b) Carl Jung
   c) Robert Smith d) Mr. Binet

4) The word 'intelligence' is derived from the Latin word _____
   a) Intellegere b) Intellectual c) Intellect d) None of these

5) Krishna's first name was _____
   a) Maya b) Sheela c) Mala d) Nergis

6) What did the policeman on the beat constantly do ?
   a) Twirl his stick
   b) Interrogate people on his beat
   c) Smoke a Cigar
   d) Unlock doors

7) What does 'shining loads' mean _____
   a) An unmarried woman's wrist b) bunches of bangles
   c) The flame of a marriage fire d) Sunlit corn
8) The words Kiltartan cross refer to _____
   a) A famous place in Ireland b) The battlefield
   c) An Irish Church d) None of the above
9) The poem 'Bangle Sellers' is written by _____
   a) W. B. Yeats b) Sarojini Naidu
   c) John Milton d) W. B. Keats
10) The speaker of the poem 'An Irish Airman Foresees His Death is _____
   a) Irish Airman or Pilot b) Farmer
   c) Sailor d) None of the above
11) Can you give me _____ money ?
   a) Any b) Some c) Little d) A few
12) A man is known by _____ company he keeps.
   a) the b) a
   c) an d) none of the above
13) The woman _____ the car is my neighbour.
   a) of b) in c) on d) under
14) What is the capital _____ Switzerland ?
   a) of b) at c) on d) from

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

1) Describe the weather in the story 'After Twenty Years'.
2) What sort of relationship did Bob and Jimmy share ?
3) What did Miss Krishna claim to be the 'Panacea for all (her) ills' ?
4) How can you define 'intelligence' ?
5) What are the areas in which the computer is much faster than human brain ?
6) What colours of bangles are suitable for a maiden's wrists ?
7) How does the speaker imagine he will die ?
8) Whom are the purple and gold-flecked grey bangles meant for ?

3. A) Write short note on **any two** of the following : **8**
   1) Jimmy Wells
   2) Miss Krishna's character
   3) The merits of artificial intelligence.

   B) Answer **any three** of the following questions briefly : **6**
   1) Describe the different types of bangles which the bangle-sellers carry.
   2) How does the poet describe the faithful wife who is now middle-aged ?
   3) What is the Irish airman's attitude towards the war he is fighting in ?
   4) What do you think is the speaker's attitude towards his 'poor' countrymen ?

4. 1) Write an essay on 'Impact of Mobiles on the lives of the Youth Today'. **14**

   OR

   2) Write paragraphs of **six** to **eight** sentences on **each** of the following :
   1) Terrorism : Irrational and Inhuman
   2) Solar energy.

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

   There are different forms of environmental pollution. Air pollution is caused by the burning of coal and oil. It can damage the earth's vegetation and cause respiratory problems in humans. A second type of pollution is noise pollution. It is the result of the noise of aircraft and heavy traffic. Further, loud music is also a cause of noise pollution, which has been seen to affect people's hearing and give them severe headaches and high blood pressure. Another source of pollution is radioactivity, which occurs when there is a leak from a nuclear power station. Radioactivity is a deadly pollutant, which kills and causes irreparable harm to those exposed to it. Land and water pollution is caused by the careless disposal of huge quantities of rubbish, sewage and chemical wastes. Pollution of rivers and seas kills fishes and other marine life and also becomes the cause of water-borne diseases. Land pollution, on the other hand, Poisons the soil, making the food grown in it unfit for consumption.

SLR-M – 11

Seat No.	

B.Sc. – I (Semester – I) (Biotechnology) (Old) Examination, 2015
FUNDAMENTALS OF CHEMISTRY AND BIOPHYSICS
Chemical Science (Paper – I)

Day and Date : Wednesday, 15-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

N. B. : *1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*
3) ***Use*** *of calculators and log table is* ***allowed****.*
4) Draw ***neat*** *diagram* ***wherever*** *necessary.*

1. Select the most correct alternative amongst those given below and write complete sentence in your answer book : **10**

i) The two solutions with same osmatic pressure are called _____ solutions.
a) isotonic b) hypotonic c) hypertonic d) isomeric

ii) Colligative property is _____ proportional to the molecular mass.
a) inversely b) directly c) not d) non-linearly

iii) Which of the following is not state function ?
a) qp b) q c) enthalpy d) entropy

iv) _____ is the relationship between ΔG° of a reaction and its equilibrium constant.
a) $-\Delta G^\circ = \frac{RT}{\ln K}$ b) $\Delta G^\circ = \frac{RT}{\ln K}$ c) $\frac{RT \ln K}{\Delta G^\circ} = -1$ d) $\Delta G^\circ = RT \ln K$

v) The number of electrons that have a total charge of 965 coulombs is _____
a) 6.022×10^{23} b) 6.022×10^{22} c) 6.022×10^{21} d) 3.011×10^{23}

vi) The valve of constant in Nerst equation $E = E^\circ - \frac{\text{const.}}{n}$ In Q at 25°C is _____
a) 0.0592 mV b) 0.0592 V c) 25.7 mV d) 0.0296 V

vii) The SI unit of molar conductivity is _____
a) S cm^2 mol^{-1} b) S dm^3 mol^{-1} c) S m^2 d) S m^2 mol^{-1}

P.T.O.

viii) Molecularity of an elementary reaction _____
a) may be zero b) is always integral
c) may be semi-integral d) may be fractional

ix) Ethylene molecule has _____ geometry.
a) square planar b) tetrahedral c) trigonal planar d) octahedral

x) _____ is the unit of rate constant for 1^{st} order reaction.
a) min^{-2} b) S c) S^{-1} d) min.

2. Attempt **any five** of the following : **10**
a) Define rate constant and give its unit for second order reaction.
b) Define dipole moment.
c) Distinguish between homogeneous and heterogeneous catalysis.
d) What is osmatic pressure ? Explain it in short.
e) What is pseudo first order reaction ? Give one example.
f) Define pH and pOH.

3. A) Attempt **any two** of the following : **6**
a) Write ionization products of NaCl, KNO_3, $CaCl_2$.
b) What are colligative properties ? Explain with example.
c) Write any three characteristics of ionic solids.

B) Explain the formation of methane molecule on the basis of VBT. **4**

4. Attempt **any two** of the following : **10**
i) Explain common ion effect with example.
ii) Write in detail formation of ethyne molecule on the basis of VBT.
iii) What is catalysis ? Explain its types with examples.

5. Attempt **any two** of the following : **10**
i) How will you establish relation between specific conductance and molar conductance ?
ii) Write any three statements of 1^{st} law of thermodynamics, explain them in short.
iii) The half life of 1^{st} order reaction is 6.0 hrs, how long it will take to complete 75% of the reactant to products.

_____

SLR-M – 12

Seat No.	

B.Sc. – I (Semester – I) Biotechnology (Old) Examination, 2015
FUNDAMENTALS OF CHEMISTRY AND BIOPHYSICS
Paper – II : Biophysics

Day and Date : Thursday, 16-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Select the most correct alternative from the following. **10**

i) _____ is used to determine rate of flow of liquid.

a) Calorimeter b) Venturimeter

c) Barometer d) Voltmeter

ii) Young's modulus is the property of _____

a) Only solids

b) Only liquids

c) Solids and liquids

d) Liquids and gases

iii) For propagation of _____ material medium is required.

a) X-rays

b) Mechanical waves

c) Light waves

d) Electromagnetic waves

iv) The phenomenon of bending of path of light at an edge of obstacle is called _____

a) reflection b) diffraction

c) refraction d) interference

v) Viscosity of water _____ with increase in pressure.
   a) decreases b) increases
   c) remains constant d) none of these

vi) In Helium-Neon Laser, type of pumping is _____
   a) electrical b) optical
   c) chemical d) thermal

vii) The SI unit of surface tension is _____
   a) J/m b) Kg/m
   c) N/s d) N/m

viii) The ratio of shearing stress to shearing strain is called _____
   a) Young's modulus
   b) Bulk modulus
   c) Modulus of rigidity
   d) Poisson's ratio

ix) If the frequency of sound wave is greater than 20 KHz, the waves are _____
   a) infrasonic b) audible
   c) ultrasonic d) none of these

x) Angle of contact between pure water and clean glass is _____
   a) 90° b) zero c) 120° d) 60°

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

1) What is the process of stimulated emission of radiation ?
2) Define :
   a) Surface tension
   b) Angle of contact.
3) Define viscosity.
4) What is Doppler effect ?
5) State the Snell's law of refraction.
6) Define :
   a) Stress
   b) Strain.

3. A) Attempt **any two** of the following : **6**
   1) Describe the process of pumping used in production of laser.
   2) Explain the surface energy of liquid.
   3) Define :
      a) Tensile stress
      b) Volume stress
      c) Shearing stress.

   B) Describe the working of Pitot's tube. **4**

4. Attempt **any two** of the following : **10**
   1) Obtain an expression for frequency of beats.
   2) Discuss the factors affecting the surface tension.
   3) Describe the construction and working of Helium-Neon Laser.

5. Attempt **any two** of the following : **10**
   1) Explain the working of venturimeter.
   2) Explain the stress-strain curve within and beyond the elastic limit.
   3) What are ultrasonic waves ? Explain in brief any two applications of them.

SLR-M – 13

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) (Old) Examination, 2015
CELL BIOLOGY AND BIOSTATISTICS
Paper – I : Cell Biology

Day and Date : Friday, 17-4-2015 Total Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the sentences using correct alternative : **10**

1) _____ are called as power house of cell.
a) Golgi complex b) Mitochondria c) Lysosomes d) ER

2) _____ are involved in protein synthesis.
a) Ribosomes b) Centrioles c) Lysosomes d) SER

3) _____ is correct sequence of cell cycle.
a) G_1, S, G_2, M b) M, G_1, G_2, S
c) G_2, G_1, S, M d) S, M, G_1, G_2

4) Thylakoids are present in _____
a) Stroma b) Grana
c) Plastid membrane d) Golgi complex

5) SER is involved in _____
a) Lipid synthesis b) Protein synthesis
c) Energy synthesis d) Food synthesis

6) In human being _____ pairs of chromosomes are present.
a) 23 b) 20 c) 25 d) 24

7) Meiosis occurs in _____ cells.
a) Somatic b) Germ c) Virus d) Bacteria

P.T.O.

8) _____ is most accepted model of plasma membrane.
   a) Fluid mosaic model b) Sandwich model
   c) Micelle d) Unit membrane

9) In bacteria, the nuclear material is called as _____
   a) Nucleoid b) Chromatin c) DNA d) Chromosome

10) In prokaryotic cells, _____ S ribosomes are present.
   a) 70 b) 80 c) 90 d) 60

2. Answer the following **(any 5)** : **10**
   1) Define cell cycle.
   2) What is cell synchrony ?
   3) Define apoptosis.
   4) Describe wobble hypothesis.
   5) What are cytoskeleton ?
   6) What is PPLOs ?

3. A) Answer the following **(any 2)** : **6**
   1) Describe the cytoskeleton in brief.
   2) Describe the structure of mitochondria.
   3) Describe the metaphase.

   B) Explain the central dogma of protein synthesis. **4**

4. Answer the following **(any 2)** : **10**
   1) Give the properties of genetic code.
   2) Describe the structure of prokaryotic cell.
   3) Explain the structure of plasma membrane.

5. Answer the following **(any 2)** : **10**
   1) Give an account of polytene chromosome.
   2) Describe the structure of nucleus.
   3) Describe the animal cell structure.

_____

SLR-M – 14

Seat No.	

B.Sc. – I (Semester – I) (Biotechnology) (Old) Examination, 2015
CELL BIOLOGY AND BIOSTATISTICS
Biostatistics (Paper – II)

Day and Date : Saturday, 18-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

Instructions : *1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicates* ***full*** *marks.*
3) ***Use*** *of calculator is* ***allowed****.*

1. Multiple choice questions : **10**

1) Parameter is a statistical measure which relates to _____
   a) Sample b) Population c) Census d) None of these

2) If A and B are mutually exclusive events defined on Ω then p (A/B) = _____
   a) 0 b) 1
   c) Between 0 and 1 d) None of these

3) Which of the following is not a possible probability ?
   a) 0.3 b) 0.03 c) 3.0 d) 0.003

4) Arithmetic mean of regression coefficient is _____ the correlation coefficient if correlation is positive.
   a) Less than b) Greater than
   c) Equal to one d) None of these

5) In the scatter diagram, if _____ then there is no correlation.
   a) r = +1 b) r = –1 c) r = 0 d) None of these

6) In a distribution if $\beta_2 = 2.45$ then the distribution is _____
   a) Leptokurtic b) Mesokurtic
   c) Platykurtic d) None of these

P.T.O.

7) In the scatter diagram, if r = _____ then there is positive correlation.
   a) +1 b) –1 c) 0 d) None of these

8) If the Karl Pearson's coefficient of skewness $Sk_p < 0$ then the distribution is _____
   a) Symmetric b) Positively skewed
   c) Negatively skewed d) None of these

9) Percentiles are those value of the variate which divides the series into _____ equal parts.
   a) 9 b) 99 c) 10 d) 100

10) The correlation coefficient is the _____ between the regression coefficient.
   a) Arithmetic mean b) Geometric mean
   c) Harmonic mean d) None of these

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

1) Define Binomial Distribution.
2) Explain error of sampling in testing of hypothesic.
3) If $Q_1 = 30$ and $Q_2 = 50$ then calculate the coefficient of Q.D.
4) Explain exclusive method of classification.
5) Define mean deviation and its coefficient.
6) Find the median of 7, 5, 12, 9, 8, 21, 14, 16, 25.

3. A) Answer **any two** of the following : **6**

1) Explain the difference between absolute measure and relative measure.
2) Skewness
3) Calculate median from the following data :

x	58	61	62	63	64	65
f	12	20	22	15	17	14

B) Write short note on tabulation. **4**

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

   1) Calculate the standard deviation and the coefficient of variation :

x	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
f	35	60	32	53	25

   2) What is regression ? Explain lines of regression Y on X and line of regression X on Y. State coefficient of regression.

   3) From the following data find missing frequency when mean is 15.38 :

Size	10	12	14	16	18	20
Frequency	3	7	?	20	8	5

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

   1) From the following information, calculate regression equation y on x

   $\sum x = 30, \sum x^2 = 220, \sum y = 40, \sum y^2 = 340, \sum xy = 214,\ n = 5.$

   2) Let X be a discrete random variable with p.m.f.

   $P(X = x) = \frac{x}{15}$, x = 1, 2, 3, 4, 5

   = 0, otherwise.

   Find E(x) and Var(X).

   3) What do you mean by measures of central tendency ? State the important properties of arithmetic mean.

SLR-M – 15

Seat No.	

B.Sc. – I (Biotechnology) (Semester – II) (New) (CGPA Pattern) Examination, 2015
ENGLISH COMPULSORY (On Track)
English Skills for Success

Day and Date : Monday, 20-4-2015 Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

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

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

1) Wernher Von Braun is known as the father of _____
   a) Rocketry b) PSLV
   c) SLV-3 d) V-2 missiles

2) To succeed is any mission, says Dr. Kalam, one needs _____
   a) Single handed victory b) Single man's devotion
   c) Single attempt success d) Single minded devotion

3) On which day was the first session of the Parliament of Religion scheduled to begin ?
   a) On May 31, 1893 b) On September 11, 1893
   c) On September 21, 1894 d) On May 31, 1894

4) After discovering 'his purse was nearly empty' what did Vivekananda do ?
   a) He held on to whatever money was left
   b) He met with Mr. J. H. Wright and asked him to help him out
   c) He begged on the roads for money
   d) He travelled to Boston with what was left

5) The Lusaka Zoo presents _____ as the world's most dangerous animal.
   a) Man b) Woman
   c) Carnivorous animals d) Reptiles

6) To find out if a society is civilized, we have to check _____
   a) Whether there is material progress
   b) Whether all the people have jobs
   c) Whether the people have freedom
   d) Whether the poorest are supported

7) Brahma is a Hindu deity who is responsible for _____
   a) The creation of the world
   b) The maintenance of the world
   c) The destruction of the world
   d) The rules of governing the world

8) One message of the poem "Brahma" is that _____
   a) Lovers of good deeds are dear to the god
   b) Lovers with sincere love are dear to the god
   c) Selfless devotees of the good are dear to the god
   d) Non-devotees of the evil are dear to the god

9) The garden of Gethsemane is famous because _____ here.
   a) Jesus Christ gave advice to his disciples
   b) Jesus Christ got knowledge under a tree
   c) Jesus Christ took his last supper
   d) Jesus Christ said his last prayer

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

11) The gentleman would not drink _____ tea without your company.
   a) my b) her c) our d) his

12) He is the _____ person for us.
   a) Valuabler b) More valuable
   c) Valuablest d) Most valuable

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

14) The _____ refused to admit him in the science stream.
   a) principle b) principal
   c) prince d) princess

2. Answer **any seven** of the following questions in **two** or **three** sentences **each** : **14**
   1) What happened to the first V-2 Missile when it was first tested ?
   2) Describe Vivekananda's meeting with J. H. Wright. How did Wright help him out ?
   3) Why was Vivekananda not prepared for the weather condition in Chicago ?
   4) What was the motivating slogan behind the American Civil War ?
   5) Why does the author declare that human rights cannot function in a vacuum ?
   6) What is the central theme of the poem "Brahma" ?
   7) What does the end of the poem "Full Moon" suggest ?
   8) What transition has taken pace in our approach to the moon ?

3. A) Write short answers on **any two** of the following : **8**
      1) How was Vivekananda's speech at the Parliament of Religions different from those of the other Speaker's ? How did it create a magic on the occasion ?
      2) What kind of personality was Von Braun according to Dr. Kalam ?
      3) What role do gods and religion have in the poem, in relation to Brahma ?

   B) Answer **any two** of the following questions briefly : **6**
      1) What is a notice ?
      2) What are the aspects of a good C.V. ?
      3) What is CC and BCC ?

4. Write a suitable C.V. for the post of a lecturer in English. **14**

   OR

   You are the principal of the Arya College of Arts and Science, Lucknow. Prepare an agenda for a meeting with the head of English department and the secretary and the treasurer of the College's literary association. The meeting has been called to discuss the venue, date time.

5. Write an e-mail message : **14**

   You have to go to work on a mechanical project for your company in Bangalore. Send an e-mail message to Rajdeep Travels (Address : rajdeeptours@rajdeep.com), asking them to make travel arrangements for you to go Singapore by air and return after a week specify airline you would prefer to travel by, the dates, the class by which you want to travel, the mode of payment, the delivery instruction and your food preferences in an attachment called 'Travel details'.

SLR-M – 16

Seat No.	

B.Sc. I (Semester – II) (New CGPA Pattern) Examination, 2015
BIOTECHNOLOGY
Environmental Pollution and Microbial Techniques

Day and Date : Wednesday, 22-4-2015 Max. Marks : 70

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

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

SECTION – I

(Environmental Pollution)

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

i) _____ is emitted by internal combustion engine.

a) Oxides of Nitrogen b) CO_2

c) PCB d) O_3

ii) Heavy metals are toxic and get deposited in _____

a) Kidney b) Liver c) Bones d) All the above

iii) Radioactive Pollution is caused by _____

a) Fertilizer industries b) Cement industries

c) Nuclear power plants d) Thermal power plants

iv) Saline Soils can be reclaimed by using _____

a) Gypsum b) Murate of potash

c) Phosphatic fertilizers d) Organic solvents

v) _____ is a renewable energy source.

a) Coal b) Petroleum c) Wood d) Solar energy

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

i) Mention any four gases responsible for global warming.

ii) Enlist effects of radiations on humans.

iii) What is BOD ?

iv) Explain effects of pesticides and fertilizers on soil.

v) What is pyrolysis ?

vi) Explain eutrophication.

vii) Enlist effects of Acid Rain.

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

i) Write in detail about Bhopal Gas Tragedy.

ii) What is Marine Pollution ? State its effects on marine organisms.

iii) Explain in detail about biogas generation.

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

i) Explain the methods of measurement of radiation and add a note on Atom bomb.

ii) Explain in detail non-conventional energy sources.

SECTION – II

(Microbial Techniques)

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

i) Hot air oven is used on _____ principle.

a) Moist Heat b) Dry Heat

c) Radiation d) Desiccation

ii) HTST method of pasteurization is achieved at _____

a) 121°C for 20 min. b) 71.7°Cfor 15 sec.

c) 62.8°C for 30 mints. d) None of these

iii) _____ method is used for staining of volutin granules.

a) Chance's b) Manvel's c) Albert's d) Gram's

iv) _____ medium is selective as well as differential.

a) Potato Dextrose Agar b) Mac Conkey's Agar

c) Saburaud's Agar d) None of these

v) Alcohol acts as _____ in Gram's staining.

a) Mordant b) Primary Stain

c) Decoloriser d) Secondary Stain

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

i) Define pure culture and give methods for isolating pure culture.

ii) Define Diauxic growth.

iii) Give difference between moist heat and dry heat used for sterilization.

iv) Define synthetic media and give its two examples.

v) Give different methods used for cultivation of anaerobes.

vi) Define chemoorganotrophs give its example.

vii) Define Lyophilization.

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

i) Spread plate technique.

ii) Mechanism of cell wall staining of bacteria.

iii) Methods of pasteurization.

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

i) Explain growth and different phases of bacterial growth.

ii) Explain different methods used for maintenance of pure culture of microorganisms.

_____

SLR-M – 17

Seat No.	

B.Sc. – I (Semester – II) (New) (CGPA Pattern) Examination, 2015
BIOTECHNOLOGY
Biochemistry and Cell Physiology

Day and Date : Friday, 24-4-2015 Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

N.B. : *1)* ***All*** *questions are* ***compulsory****.*
2) Draw the ***neat*** *labelled diagram* ***wherever*** *necessary.*
3) Figures to the ***right*** *indicate* ***full*** *marks.*
4) Answers of Section ***I*** *and* ***II*** *should be written in* ***separate*** *answerbooks.*

SECTION – I
(Biochemistry)

1. Multiple choice questions : **5**

1) Impaired blood clotting is caused due to the deficiency of _____
   a) Vitamin E b) Vitamin D
   c) Vitamin A d) Vitamin K

2) Chitin is an example of _____ polysaccharide.
   a) Storage b) Structural
   c) Active d) Inactive

3) _____ is an example of sulphur containing amino acid.
   a) Cystiene b) Methionine
   c) Threonine d) Both a) and b)

4) Hydrogen peroxide is formed in cells due to the action of antioxidant enzyme _____
   a) Superoxide dismutase b) Catalase
   c) Kinase d) Lipase

5) B type of DNA has _____ base pairs per turn.
   a) 11 b) 12 c) 14 d) 10

2. Answer **any five** of the following : **10**
   i) What is mutarotation ?
   ii) Give the classification of Vitamins.
   iii) Write about types of DNA.
   iv) What is the biological role of leukotrienes ?
   v) Which are the bonds that stabilize the protein structure ?
   vi) Draw the chemical structure of starch.
   vii) State the Chargaff's rule for nucleic acids.

3. A) Write short notes on **any two** of the following : **10**
   i) Properties and cyclic structure of monosaccharides
   ii) Isoprenic chain quinones
   iii) 3D conformation of protein.

   B) Answer **any one** of the following : **10**
   i) Describe water and fat soluble Vitamins on the basis of source, biochemical functions and deficiencies.
   ii) Describe types and structures of lipids. Add a note on ecosanoid compounds.

SECTION – II
(Cell Physiology)

1. Multiple choice questions : **5**
   1) Cell elongation in plants is caused by _____
      a) Auxin b) Gibberellin
      c) Florigen d) Traumatin
   2) Cytochromes are _____
      a) Hydrogen acceptors b) Water acceptors
      c) Oxygen acceptors d) Electron acceptors
   3) Structural and functional unit of muscle contraction is _____
      a) Centromere b) Sarcomere
      c) Telomere d) Myomere

4) _____ is act as second messengers during hormone action.

a) Mg^{++} ions b) Ca^{++} ions

c) Mn^{++} ions d) Mn^{++} ions

5) _____ is act as primary sex hormone in males.

a) Estrogen b) Progesterone

c) Testosterone d) Thyroid hormone

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

1) What are essential elements ?
2) Factors affecting photosynthesis.
3) What is mean by vernalisation ?
4) Draw a neat labelled diagram of Nephron.
5) Hormones of adrenal gland.
6) Justify ATP and $NADPH_2$ is assimilatory power.
7) Define micturition.

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

1) Describe in detail composition of blood.
2) Write a note on phytohormones.
3) Describe in detail structure and function of pituitary gland.

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

1) Write a essay on transpiration.
2) Describe in detail mechanism of urine formation.

_____

SLR-M – 18

Seat No.	

B.Sc. – I (Biotechnology) (Semester – II) (New) (CGPA Pattern) Examination, 2015
BIOMETRY AND TISSUE CULTURE

Day and Date : Monday, 27-4-2015 Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

N. B. *: 1)* ***All*** *questions are* ***compulsory****.*
2) Answers to ***each*** *Section are to be written in* ***separate*** *answer book.*
3) Draw ***neat*** *labelled diagram* ***wherever*** *necessary.*
4) Figures to ***right*** *indicate* ***full*** *marks.*

SECTION – I

(Biometry)

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

1) If A = {1, 2, 2, 1, 3, 4, 3, 4} then n(A) = _____
   a) 0 b) 4 c) 8 d) 20

2) If $z = 2 - 3i$ then $\bar{z}$ = _____
   a) $2 - 3i$ b) $2 + 3i$ c) $2i - 3$ d) $2i + 3$

3) If $f(x) = x^3 + 2x - 9$ then $f(-1)$ = _____
   a) – 12 b) 12 c) – 6 d) – 11

4) If $f(x) = 7x^2 + 5x - 1$ then $f'(0)$ = _____
   a) 0 b) 5 c) – 1 d) 7

5) Matrix $A = \begin{bmatrix} 3 & 2 \\ 9 & 6 \end{bmatrix}$ is
   a) Unit matrix b) Symmetric matrix
   c) Singular matrix d) Diagonal matrix

P.T.O.

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

1) If D = {7, 8, 9}, write down the power set of D.

2) If $z_1 = 3 + 2i$ and $z_2 = 4 - 5i$ then find $z_1 \cdot z_2$.

3) If $f(x) = 3x + 2$ and $g(x) = 5x^2 + 1$ then find $g \circ f$.

4) Evaluate $\lim_{x \to 0} \frac{\sin 3x}{\sin 4x}$.

5) If $f(x) = 5x^7 + 7(5^x)$ then find $f'(x)$.

6) Evaluate $\int \left(3 \sec^2 x - \frac{4}{x}\right) dx$.

7) Evaluate $[3\ 4\ 1] \begin{bmatrix} 4 \\ 2 \\ -1 \end{bmatrix}$.

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

1) In a school there are 20 teachers who teach History or Geography, of these 12 teach History and 4 teach both History and Geography. How many teach Geography ?

2) If $y = 7x \sin x + 3^x$ find $\frac{dy}{dx}$.

3) Evaluate $\int 3x \cdot e^{2x}\, dx$.

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

1) Examine the maxima and minima of the function $f(x) = 2x^3 - 15x^2 + 36x + 5$. Also find the maximum and minimum values of f(x).

2) Find A^{-1} and rank of matrix

$$A = \begin{bmatrix} 1 & 1 & 2 \\ 1 & 2 & 3 \\ 0 & -1 & -1 \end{bmatrix}.$$

SECTION – II

(Introduction to Tissue Culture)

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

   1) Cobalt and Nickel inhibit _____ synthesis.

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

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

      a) μ g/Lit. b) mg/Lit. c) ng/Lit. d) pg/Lit.

   3) _____ described procedure to obtain passaged monolayer.

      a) Eagle b) Carrel c) Dulbecco d) Haberlandt

   4) Most important protein required for growth of animal cell is _____

      a) Immunoglobulin b) Karetin

      c) Casein d) Albumin

   5) Most common measurement of cell viability are based on _____ integrity.

      a) Membrane b) Cytoplasm c) Protoplast d) Nucleolus

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

   1) Write a note on green house.
   2) Describe gelling agent.
   3) Plant growth hormones.
   4) Continuous cell line.
   5) Function of CO_2 incubator.
   6) Natural media.
   7) Laminar air flow.

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

      1) Describe tissue culture technique to produce novel plants.
      2) Explain warm trypsinization.
      3) Give details of pollen culture.

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

      1) Explain laboratory design for animal tissue culture.
      2) Give detail account on organogenesis.

_____

SLR-M – 19

Seat No.	

B.Sc. – I (Biotechnology) (Sem. – II) Examination, 2015
(New CGPA Pattern)
TAXONOMY AND COMPUTER SCIENCE

Day and Date : Wednesday, 29-4-2015 Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

N. B. *: 1)* ***All*** *questions are* ***compulsory****.*
2) Answer to the ***both*** *Section are to be written in* ***separate*** *answer book.*
3) ***Draw*** *neat labelled diagram* ***wherever*** *necessary.*
4) Figures to ***right*** *indicate* ***full*** *marks.*

SECTION – I
(Taxonomy)

1. Choose the correct answer from given alternatives : **5**

   1) _____ is green algae.
      a) Chlorophyta b) Phaeophyta c) Rhodophyta d) Xanthophyta
   2) Pigeon belongs to the class _____
      a) Mammalia b) Pisces c) Aves d) Reptilia
   3) Light passing capacity of colony known as _____
      a) Consistancy b) Opacity c) Elevation d) Motility
   4) The basic unit of classification is _____
      a) Phylum b) Species c) Genus d) Family
   5) _____ is the female reproductive organ in angiosperm.
      a) Archegonia b) Gynoecium c) Androecium d) Pollen grain

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

   i) Explain taxonomic rank with suitable example.
   ii) Write a note on characteristics of angiosperms.
   iii) Archaebacteria.
   iv) Aims and principles of taxonomy.

P.T.O.

v) Write general characters of Urochordata.

vi) Write a note on Actinomycetes.

vii) Enlist the classes of phylum Mollusca.

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

i) Ainsworth 1973 fungal classification.

ii) General characters of Bryophytes.

iii) Explain salient features of Gnathostomata.

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

i) Explain in detail merits and demerits of Bentham and Hooker classification system.

ii) Explain cultural and biochemical characters of microbes for classification.

SECTION – II
(Computer Science)

1. Choose the correct alternatives from the given below : **5**

1) The file extension of MS-Access is _____

a) .doc b) .mdb c) .txt d) .xls

2) Fifth generation computers are based on _____

a) Artificial intelligence b) Programming based

c) System knowledge d) None of these

3) Google chrome is an example of _____

a) Operating system b) Browser

c) Program d) None of these

4) Any data or instruction entered into the memory of a computer is considered as _____

a) storage b) output c) input d) information

5) _____ memory is non-volatile.

a) RAM b) ROM

c) Cache memory d) None of these

2. Answer **any five** of the following : **10**
   1) Data base
   2) LAN
   3) Flowchart
   4) Output devices
   5) Browser
   6) Input and output
   7) HTTP Protocol.

3. A) Answer **any two** of the following : **10**
      1) Explain types of computers.
      2) Write a note on database with example.
      3) Explain types of memory.

   B) Answer **any one** of the following : **10**
      1) Explain computer organization input, output process and draw the diagram of it.
      2) Explain algorithm and flowchart in detail.

SLR-M – 2

Seat No.	

B.Sc. – I (Sem. – I) (C.G.P.A. Pattern) Examination, 2015
BIOTECHNOLOGY
Ecology and Microbiology

Day and Date : Tuesday, 7-4-2015 Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

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

SECTION – I
(Ecology)

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

   1) _____ % of water is locked into ice caps and glaciers.
   a) 0.6 b) 2.1 c) 0.0001 d) 97.2

   2) The initial community of colonizing species in a particular area is known as _____ community.
   a) Climax b) Pioneer c) Keystone d) Umbrella

   3) The region that receive an average of 25 centimeter of rainfall or less per year are considered to be _____
   a) Forest b) Desert c) Estuary d) Coast

   4) _____ is an example of gaseous type of biogeochemical cycle.
   a) Phosphorus cycle b) Sulphur cycle
   c) Oxygen cycle d) Hydrological cycle

   5) Sunderban Biosphere Reserve is located in _____
   a) Assam b) West Bengal
   c) Uttar Pradesh d) Arunachal Pradesh

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

   i) What is detritus food chain ?

   ii) Draw neat labelled diagram of structure of atmosphere.

P.T.O.

iii) Enlist any four threats to biodiversity.

iv) Explain Endangered and Endemic species.

v) Give any four examples of Ex-situ conservation.

vi) Discuss the process of decomposition.

vii) Explain the flow of energy through an ecosystem.

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

i) Mineral Resources

ii) Silent Valley Movement

iii) Lithosphere.

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

i) Explain the ecological pyramids with reference to forest ecosystem and add a note on food chain in forest ecosystem.

ii) Write a note on biodiversity hotspots and explain the methods used for conservation of wildlife.

SECTION – II
(Microbiology)

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

1) Robert Koch discovered _____ is causative agent of tuberculosis.

a) Mycobacterium tuberculosis b) Mycobacterium leprae

c) Vibrio cholerae d) E. Coli

2) Mesosomes is the invasion of _____

a) Cell wall b) Capsule

c) Cell membrane d) Flagella

3) Viruses are _____ in structure.

a) Prokaryotic

b) Eukaryotic

c) Neither prokaryotic nor Eukaryotic

d) None of these

4) Single flagellum only at one pole of the cell is called _____ flagellar arrangement.
   a) Monotrichous b) Lophotrichous
   c) Amphitrichous d) Peritrichous

5) _____ is example of bacteria lacking cell wall.
   a) Mycoplasma b) Chlamydia c) E. Coli d) None of these

2. Answer **any five** of the following : **10**
   i) Koch's postulates.
   ii) General characteristics of Algae.
   iii) Define capsule and slime layer.
   iv) Reserve food materials in bacteria.
   v) Function of flagella and pili.
   vi) Define geomicrobiology and give its significance.
   vii) General characteristics of Rickettsia.

3. A) Write short notes on **any two** of the following : **10**
   i) Development of Microscope.
   ii) Structure and function of Flagella in bacteria.
   iii) Classification of fungi.

   B) Answer **any one** of the following : **10**
   i) Give an account on structure of gram positive bacterial cell wall.
   ii) Write an essay on difference between prokaryotic and eukaryotic cells with well labelled diagram.

_____

SLR-M – 20

Seat No.	

B.Sc. – I (Biotech.) (Old) (Semester – II) Examination, 2015
ENGLISH (Comp.)
On Track – English Skills for Success

Day and Date : Monday, 20-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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 : **10**

1) Dr. Kalam successfully tested _____ while in France.
   a) V-2 Missile b) Jupiter Missile
   c) SLV-3 Apogee motor d) Agni Missile

2) _____ represented the Jains at the Parliament of Religions.
   a) Vivekananda
   b) Mahatma Gandhi
   c) Annie Besant
   d) Pratap Chander Mazoomdar

3) After our incredible scientific progress, what is the greatest threat to humanity ?
   a) Natural calamity
   b) Diseases
   c) The human being himself
   d) Nuclear weapons

4) But thou, made lover of the _____ !
   Find me, and turn thy back on heaven.
   a) Nature b) Beauty
   c) Good d) Mankind

5) In the poem Full Moon, bubble house is the _____
   a) heaven b) bungalow
   c) big factory d) moon

P.T.O.

6) No longer_____ of goddess to whom we pray.
   a) Palace b) Throne
   c) House d) Temple

7) The antonym of the word dormant is _____
   a) Latent b) Active
   c) Passive d) Inactive

8) Mother is a _____ singer than me.
   a) Best b) Better
   c) Good d) More good

9) Who won the race ? The _____ or the tortoise ?
   a) Hire b) Hare
   c) Here d) Hear

10) Find the synonym of the word diffident.
   a) Confident b) Tolerant
   c) Shy d) Difficult

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

1) What were the points about the new culture that struck Vivekananda on his arrival in America ?
2) What are the sings of hope for a better World that Palkhiwala sees ?
3) What advice did Verner Van Braun give to Dr. Kalam ?
4) Describe Vivekananda's meeting with J. H. Wright.
5) What is the complex that Von Braun attributed to the Americans ?
6) What do you understand by Human Rights ?

3. A) Answer **any two** of the following questions briefly : **6**

1) What is the central theme of the poem Brahma ?
2) What role do gods and religion have in the poem Brahma ?
3) Why does the poet bemoan the moon's fate ?

B) Write short answers to the following **(any two)** : **4**

1) Draft a notice of the second meeting of the Managing Director of ABC Institute to be held at the Head Office at 5 p.m. on Saturday 10 May 2014.

2) You are the Chairman of SUTA, Solapur. Prepare an agenda for a meeting with the VC. The meeting has been called to discuss the venue, date and time.

3) Write in brief the role of email in the process of communication.

4. Answer the following **(any one)** : **10**

1) You are Anne Jacob, a graduate in chemical engineering from NIT Hyderabad. You have three years experience as an assistant project engineer with a fertilizer company. Write an email application letter in response to an advertisement for the post of project engineer in the Well-known petrochemical company. Refer only briefly to your educational qualifications and work experience in the body of the letter and say that you are attaching your CV.

2) You are Asha Kiran, Secretary of the English Literary Association, Mangalore College Mangalore. Prof. Kiran Nagarkar a well-known novelist has agreed to inaugurate the Association on 15 May 2014. Write a notice informing about the meeting of office bearers of the Association, about the date, time and venue of the function and also prepare minutes of the said meeting.

5. Suppose you are applying for the post of Assistant Professor of Chemistry in Rayat Shikshan Sanstha, Satara. Prepare a CV for the post mentioned above. **10**

———————

SLR-M – 21

Seat No.	

B.Sc. (Part – I) (Semester – II) Examination, 2015
BIOTECHNOLOGY
(Env. Pollution and Microbial Techniques) (Old)
Pollution (Paper – I)

Day and Date : Tuesday, 21-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the following sentences by selecting correct answers from given alternatives. **10**

1) The Bhopal gas tragedy occurred in 1984, due to toxicity of _____ gas.
   a) Pesticide fumes
   b) Benzyl mercury
   c) Methyl isocynate
   d) Phenyl mercury

2) The concentration of chemicals, which increases at each trophic level of food chain are known as _____
   a) Biomagnification
   b) Biotransformation
   c) Bioaccumulation
   d) Reduction

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

4) _____ is not a type of fossil fuel.
   a) Coal b) Oil
   c) Natural gas d) Biofuel

P.T.O.

5) The half life of DDT in temperate climate is _____
   a) 10 – 15 years b) 5 – 6 years
   c) 2 – 4 years d) 20 years
6) Carbon monoxide hazardous to health because, _____
   a) It causes loss of sense of smell
   b) It is carcinogenic in nature
   c) It reduces oxygen carrying capacity of blood
   d) It causes conjunctivitis
7) Energy obtained from sea waves are called _____
   a) Thermal energy
   b) Tidal energy
   c) Geo-thermal energy
   d) Biomass energy
8) Depletion of ozone layer in the outer atmosphere is increase the incidence of _____
   a) Skin cancer b) Lung cancer
   c) Bronchitis d) Kidney damage
9) Eutrophication of water bodies is caused by the _____
   a) Discharge of toxic substances
   b) Excessive discharge of nutrients
   c) Discharge of chlorides
   d) Discharge of total solids
10) The soil acidity is controlled by using _____
   a) Urea b) Phosphorus
   c) Lime d) Nitrogen

2. Describe **any 5** of the following : **10**
   1) What is global warming ?
   2) Enlist sources of marine pollution.
   3) Explain what is gasification.
   4) Write down advantages of solar energy.
   5) Write down unit of radiation measurement.
   6) Write down effect of chemical fertilizer.

3. A) Write down **any two** of the following : **6**

   1) Write down briefly on ozone layer depletion effects.

   2) Explain what is eutrophication ?

   3) Write down briefly on Minamata disease.

   B) What is thermal pollution ? Explain effects of thermal pollution on aquatic ecosystem. **4**

4. Write down note on **any two** of the following : **10**

   1) Write down in details different treatment methods of radioactive pollutant.

   2) Write down Air (Prevention and Control of Pollution) Act in detail.

   3) Write down sources and effects of soil pollution.

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

   1) Enumerate different air pollutants and write down their effect on human health.

   2) Explain the term 'biomagnification', giving example of DDT at different trophic level.

   3) Describe the process of biogas generation.

SLR-M – 22

Seat No.	

B.Sc. – I (Semester – II) (Biotechnology) (Old) Examination, 2015
ENVIRONMENTAL POLLUTION AND MICROBIAL TECHNIQUES
Microbial Techniques (Paper – II)

Day and Date : Wednesday, 22-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the sentences using correct alternatives : **10**

i) Alcohol acts as a _____ in Gram's staining.
   a) Mordant b) Primary stain
   c) Decolouriser d) Secondary stain

ii) U.V. rays are effective against bacteria at _____
   a) 150 nm b) 390 nm c) 102 nm d) 265 nm

iii) _____ medium is selective as well as differential.
   a) Potato Dextrose Agar b) Mac Conkey's
   c) Sabouraud's d) None of these

iv) Blood agar media is example of _____
   a) Natural b) Artificial c) Both d) None of these

v) _____ method is known for acid fast staining.
   a) Manvel's b) Albert's c) Gram's d) Ziehl-Neelsen

vi) Growth in the cell population in which all cells divide the same time known as _____ growth.
   a) Diauxic b) Simple c) Synchronous d) Periodic

vii) Pasteurisation is _____
   a) Sterilization b) Partial sterilization
   c) Sanitisation d) Disinfection

viii) _____ is acts as mordant in capsule staining.
   a) Alcohol b) Phenol c) $FeCl_3$ d) $FeCl_2$

P.T.O.

ix) Rosenthal method is used for culturing _____

a) Aerobic bacteria b) Anaerobic bacteria

c) Both of these d) None of these

x) The organism which use CO_2 as carbon source and light as energy source belongs to _____

a) Phototroph b) Chemoautotroph

c) Photoheterotroph d) Chemoheterotroph

2. Write short answers (**any five**) : **10**

1) Give examples of disinfectants.

2) Define pasteurisation.

3) Define photolithotrophs.

4) Give two examples of selective media.

5) Define pure culture.

6) Define basic stain and give its examples.

3. A) Answer **any two** of the following : **6**

1) Explain diauxic growth with neat labelled diagram.

2) Write short note on Autoclave.

3) Explain different methods used for cultivation of anaerobes.

B) What is meant by pure culture ? Discuss in detail the methods of isolation of pure culture. **4**

4. Write brief note on (**any two**) : **10**

1) Physical agents used for sterilization.

2) Growth phases in bacterial culture.

3) What is meant by culture media ? Write in detail about differential and selective media with example.

5. Write a brief note on (**any two**) : **10**

1) Different theories to explain Gram staining mechanism.

2) Write on account on sterilization of filtration.

3) Laboratory methods of determination of growth.

_____

SLR-M – 23

Seat No.	

B.Sc. – I (Semester – II) Examination, 2015
BIOTECHNOLOGY
Biochemistry and Cell Physiology (Paper – I) (Old)
Biochemistry

Day and Date : Thursday, 23-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the following sentences by selecting correct alternative given below : **10**

i) _____ is not a reducing sugar.
a) Lactose b) Maltose c) Sucrose d) Fructose

ii) _____ lipid contains alcoholic amino residue.
a) Phosphotidic acid b) Triglyceride
c) Glucocerebroside d) Sphingomyelin

iii) Globular proteins are soluble in _____
a) pure acetone b) aqueous alcohol
c) absolute alcohol d) benzene

iv) A nucleotide consists of nitrogenous base _____
a) only b) + sugar
c) + phosphate d) + sugar + phosphate

v) One manifestation of Vitamin A deficiency is _____
a) painful joints b) loss of hair
c) porous bone d) night blindness

vi) The complementary base of adenine in RNA is _____
a) thymine b) cytosine c) guanine d) uracil

vii) In many proteins the hydrogen bonding produces a regular coiled arrangement called _____
a) α-helix b) β-sheet c) hair pin d) both b) and c)

viii) The cholesterol molecule is a _____

a) benzene derivative b) quinoline derivative

c) steroid d) straight chain fatty acid

ix) Flavoproteins contains _____ vitamin.

a) B_6 b) B_2 c) B_1 d) B_{12}

x) A carbohydrate commonly known as dextrose is _____

a) dextrin b) fructose c) D-glucose d) glycogen

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

i) Define carbohydrates and give their different classes.

ii) Distinguish between saturated and unsaturated fatty acids.

iii) Write in brief about lipoproteins.

iv) State and explain Chargraff rule.

v) Describe the biochemical functions of Vitamin D.

vi) Write the structural formula of lactose and state glycosidic bond in it.

3. A) Answer **any two** of the following : **6**

i) Discuss the different components of sphingolipids.

ii) Explain the amphoretic character of protein.

iii) Illustrate the physico-chemical properties of nucleic acid.

B) Describe any four chemical properties of monosaccharides. **4**

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

i) What are nucleotides ? Explain how are they formed ?

ii) Give the classification of amino acids based on their side chains.

iii) Describe the structures of carotenoids. Add a note on their functions.

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

i) Explain the formation of cyclic forms of glucose and fructose.

ii) Write an account of secondary structures of protein.

iii) Discuss the structure, biochemical function and deficiency disorder of Vitamin E.

_____

SLR-M – 24

Seat No.	

B.Sc. – I (Sem. – II) (Biotechnology) Examination, 2015
BIOCHEMISTRY AND CELL PHYSIOLOGY (Old)
Cell Physiology (Paper – II)

Day and Date : Friday, 24-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the following sentences by choosing correct alternatives : **10**

1) In plants, maximum transpiration occurs through _____
   a) Stomata b) Cuticle c) Lenticels d) Bark

2) _____ are considered as critical elements.
   a) CHO b) NPK c) NCHO d) All of these

3) The fruit ripening hormone is _____
   a) Ethylene b) Gibberellin
   c) Abscisic acid d) Cytokinin

4) 'Kranz anatomy' is the characteristic feature of _____
   a) Ground nut b) Maize c) Mango d) Garden pea

5) In human saliva _____ enzyme is present.
   a) Pancreatic amylase b) Lipase
   c) Salivary amylase d) Sucrase

6) _____ is considered as fluid connective tissue in humans.
   a) Lymph b) Blood c) Serum d) Plasma

7) Structural and functional unit of kidney is _____
   a) Neuron b) Seminiferous tubules
   c) Nephron d) Nerve Cell

8) _____ is known master endocrine gland.
   a) Thyroid gland b) Pituitary gland
   c) Thymus d) Pancreas

9) _____ is act as structural and functional unit of neural system in humans.
   a) Ganglion b) Adipocyte c) Nephron d) Neuron

10) _____ organ is known as dual organ.
   a) Kidney b) Heart c) Pancreas d) Brain

2. Answer the following questions (**any 5**) : **10**
   1) Define vernalisation.
   2) Enlist essential mineral elements in plants.
   3) Explain photorespiration.
   4) Enlist factors affecting photosynthesis.
   5) Malphigian body.
   6) Enlist different types of joints in humans.

3. A) Answer **any two** of the following. **6**
   1) Describe stomatal transpiration.
   2) Write a note on plant growth regulators.
   3) Describe mechanism of respiration in humans.

   B) Describe human excretory system. **4**

4. Answer the following (**any 2**) : **10**
   1) Describe structure and function of pituitary gland.
   2) Describe human digestive system.
   3) Explain C4 pathway in plants.

5. Answer the following (**any 2**) : **10**
   1) Write a note on light reaction.
   2) Explain mechanism of urine formation.
   3) Explain mechanism of absorption of elements in plants.

_____

SLR-M – 25

Seat No.	

B.Sc. (Part – I) (Semester – II) Examination, 2015
BIOTECHNOLOGY
Biometry and Tissue Culture (Old)
Biometry (Paper – I)

Day and Date : Saturday, 25-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

Instructions *: i)* ***All*** *questions are* ***compulsory****.*
ii) Figures to the ***right*** *indicate* ***full*** *marks.*
iii) ***Use*** *of calculator is* ***allowed****.*

1. Multiple choice questions : **10**

1) If matrix A is said to be skew symmetric if A^t = _____

a) A b) A^t
c) –A d) None of these

2) $\lim_{x \to 0} \frac{\log (1+x)}{x}$ = _____

a) 1 b) –1
c) 0 d) None of these

3) $\frac{d}{dx} \cot x$ = _____

a) Sec^2x b) $secx \cdot tanx$
c) $-cosec^2x$ d) $-cosecx \cdot cotx$

4) Let $z = 3 + 2i$ be a complex number then $\overline{Z}$ = _____

a) $-3 + 2i$ b) $3 - 2i$
c) $-3 - 2i$ d) None of these

5) If $Z = -3 + 4i$ then $|Z|$ = _____

a) 8 b) 7 c) –1 d) 5

P.T.O.

6) A point (a, b) is said to be saddle point of f (x, y) if in every neighbourhood of (a, b), f (x, y) has _____

a) Maximum

b) Minimum

c) Neither maximum nor minimum

d) None of these

7) $\int \frac{1}{1+x^2}\,dx =$ _____

a) $\tan^{-1}x + c$ b) $\sin^{-1}x + c$

c) $\cos^{-1}x + c$ d) $\cot^{-1}x + c$

8) Let A and B be two sets then the difference set A – B = _____

a) $\{x \in A \mid x \notin B\}$ b) $\{x \in A \text{ and } x \in B\}$

c) $\{x \in B \mid x \notin A\}$ d) None of these

9) If size of set A is 'n' then the size of power set of A P(A) = _____

a) n^2 b) 2^n c) n d) None of these

10) The differential equation $\frac{d^2y}{dx^2} + gy = \sin 3x$ has degree and order _____

a) 1, 2 b) 1, 1 c) 2, 1 d) None of these

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

1) Evaluate $\lim_{x \to 0} \frac{\sin 5x \cdot \sin 2x}{x^2}$.

2) Let $z_1 = 2 + 4i$ and $z_2 = 1 - 2i$. Find $z_1 + z_2$ and $z_1 \cdot z_2$.

3) Find $\frac{dy}{dx}$ if $y = x\sin x$.

4) Evaluate $\int \left(3\sin x - 4\,\text{cosec}^2 x + 5\right)dx$.

5) If A = {2, 3, 5} and B = (3, 5, 7, 9} write B – A and the powers set of B – A.

6) Find x and y which satisfy the following equation

$$\begin{bmatrix} -1 & 8 \\ 2 & y \end{bmatrix} + 3\begin{bmatrix} x & y \\ 1 & 2 \end{bmatrix} = 5\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}.$$

3. A) Answer **any two** of the following : **6**

1) Obtain differential equation by eliminating arbitrary constant from following general solution $y = ae^x + be^{-x}$.

2) $\lim_{x \to 0} \dfrac{15^x - 3^x - 5^x + 1}{x^2}$.

3) If $y = \log \dfrac{2 + 3\sin x}{2 - 3\sin x}$.

Find $\dfrac{dy}{dx}$.

B) Show that $7\log\left(\dfrac{15}{16}\right) + 6\log\left(\dfrac{8}{3}\right) + 5\log\left(\dfrac{2}{5}\right) + \log\left(\dfrac{32}{25}\right) = \log 3$. **4**

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

1) Solve 2y cosx dx + 3 sinx dy = 0.

2) If y = tanx + secx prove that $\dfrac{d^2y}{dx^2} = \dfrac{\cos x}{(1 - \sin x)^2}$.

3) Show that the following system is inconsistent :

2x + 6y = –11

6x + 20y – 6z = –3

6y – 18z = –1.

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

1) Find the inverse of the following matrices by adjoint method

$$\begin{bmatrix} 2 & -2 & 3 \\ 3 & -1 & 2 \\ 1 & 2 & -1 \end{bmatrix}.$$

2) Find stationary points and determine the nature of the given function at those points $f(x, y) = x^2 + 3xy + y^2$.

3) If A = {a, b, 1, 7} B = {1, 2, 5, d} are subsets of

U = {a, b, c, d, 1, 2, 3, 4, 5, 7}

i) Verify $(A \cap B)' = A' \cup B'$

ii) Verify $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$.

———————

SLR-M – 26

Seat No.	

B.Sc. Biotechnology – I (Semester – II) Examination, 2015
BIOMETRY AND TISSUE CULTURE (Paper – II)
Introduction to Tissue Culture (Old)

Day and Date : Monday, 27-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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) _____ cells have finite life span on artificial medium.
a) Normal b) Cancerous c) Tumour d) Abnormal

2) _____ of cultured cell is increased by increased attachment of cells to substrate.
a) Ability b) Efficiency c) Capability d) Activity

3) _____ is used for disaggregation of normal, embryonic as well as cancerous cell.
a) Cellulase b) Pectinase c) Collagenase d) Trypsin

4) Stomata were more open in plants grown in presence of higher _____
a) Uranium b) Potassium c) Magnesium d) Calcium

5) The _____ of the somatic plant cell of a culture to produce embryoids is known as embryogenic potential.
a) Capability b) Inability c) Toxicity d) Viability

6) Higher concentration of Auxin exists at the _____
a) Leaves b) Growing tips of plants
c) Xylem and Phloem d) Base of any plant organ

7) Elements required by plants in concentration greater than 0.5 mmol/lit. are referred as _____
a) Vitamins b) Cofactors
c) Macromolecules d) Micromolecules

8) _____ is a type of organogenesis by which only adventitious root formation takes place.
   a) Cytogenesis b) Caulogenesis
   c) Embryogenesis d) Rhizogenesis

9) _____ method is cheap and quick method of cell separation.
   a) Physical b) Clinical c) Enzymatical d) Orbital

10) Viable cells are permeable to _____
   a) Propidium iodide b) Eosin Y.
   c) Diacetyl fluoresin d) Fluoresin

2. Answer the following (**any five**) : **10**
   1) Culture vessel in PTC.
   2) Plant growth hormone.
   3) Artificial seed.
   4) Function of CO_2 incubator.
   5) Write a note on organ culture.
   6) Write a note secondary cell line.

3. A) Answer the following (**any two**) : **6**
   1) Explain membrane integrity assay for viability.
   2) Discuss callus culture.
   3) Describe oxidative. Browning during micropropagation.

   B) Explain in detail role of inorganic micronutrients in plant tissue culture. **4**

4. Answer the following (**any two**) : **10**
   1) Explain warm trypsinization.
   2) Give details of pollen culture.
   3) Explain different constituents of serum.

5. Answer the following (**any two**) : **10**
   1) Discuss different stages of in vitro clonal propagation.
   2) Explain natural media for animal tissue culture.
   3) Describe in detail suspension culture.

_____

SLR-M – 27

Seat No.	

B.Sc. – I (Biotechnology) (Semester – II) Examination, 2015
TAXONOMY AND COMPUTER SCIENCE (Old)
Taxonomy (Paper – I)

Day and Date : Tuesday, 28-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the complete sentence by selecting appropriate alternatives gives : **10**

1) Gymnosperms have been placed in between dicot and monocot in the classification of plants by _____

a) Charles E. Bessey b) Benthum and Hooker

c) Alfred Rendle d) Hutchinson

2) Fungi are classified according to _____ system of classification.

a) Anisworth b) Benthum

c) Hooker d) de Candolle

3) The science which deals with identification, classification and nomenclature called as _____

a) Physiology b) Anatomy

c) Taxonomy d) Paleobotany

4) Rickettsia are _____

a) gram negative b) gram positive

c) both d) none

5) The phylum Arthropoda is classified into _____ subphyla

a) 7 b) 8 c) 9 d) 4

P.T.O.

6) Scientific names are always written in _____

a) Marathi b) Latin

c) English d) Hindi

7) Collection of plant, which are dried, pressed, mounted on herbarium sheet called as _____

a) Herbarium b) Collection

c) Nomenclature d) Both a) and c)

8) _____ system of classification used while classifying bryophytes.

a) G. M. Smith b) Candolle

c) Darwin d) Batson

9) Original herbarium prepared by the author called as _____

a) Holotype b) Neotype

c) Lectotype d) Isotype

10) Full form of IUCN _____

a) Internation Union for Conservation of Nature and Natural resources

b) International Union for Conservation of Nature

c) International Union for Conservation of Natural resources

d) None

2. Write short answer **(any five)** : **10**

1) Numerical Taxonomy

2) General characters of mycoplasma

3) Economic importance of fungi

4) Principle of ICBN

5) Any 2 methods of typification

6) General characters of Bryophytes.

3. A) Write a short note on **(any two)** : **6**

   1) Merits of Benthum and Hookers system.

   2) Outline classification of Bryophytes.

   3) Give the difference between 2, 3, and 5 kingdom system.

   B) Write distinguishing features of algae with fungi. **4**

4. Write a brief note on **(any two)** : **10**

   1) General characteristics of Archebacteria.

   2) Outline classification up to the class of Angiosperms.

   3) Bionomial nomenclature.

5. Write a brief note on : **10**

   1) Write in detail outline classification up to the class of kingdom protochordata.

   2) Describe in detail merits and demerits of Benthum and Hookers system of classification.

   3) Describe in detail general characteristics and economic importance of angiosperms.

SLR-M – 28

Seat No.	

B.Sc. – I (Biotechnology) (Semester – II) Examination, 2015
TAXONOMY AND COMPUTER SCIENCE (Old)
Paper – II : Computer Science

Day and Date : Wednesday, 29-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Choose the correct alternatives from the following and rewrite the sentences : **10**

1) _____ is known as unprocessed information.
a) Information b) Data c) Hardware d) Software

2) _____ can be defined as a set of programs necessary to carry out operations for a specific job.
a) Software b) Hardware c) Program d) None

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

4) A diamond box is used to indicate _____ in flow charts.
a) input b) output c) decision d) none

5) Writing a program task in simple sequence and in simple English is known as _____
a) flow chart b) algorithm c) code d) none

6) The most widely used operating system is _____
a) Unix b) Windows c) DOS d) Linux

7) Extension of word document is _____
a) .doc b) .ppt c) .xls d) .mdb

8) Hub is a central point of controller for a _____network.
a) ring b) star c) bus d) hybrid

9) WWW stands for _____

a) World Wide Web b) World Web World

c) World Wide Webserver d) None of these

10) The largest network is _____

a) LAN b) MAN c) Internet d) Usenet

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

i) Explain application software with example.

ii) How will you open word document ? (two methods)

iii) Explain operating system with it's types.

iv) Explain principles of algorithm.

v) Explain need of database.

vi) Converting decimal to binary values $42_{10} = ?_2$.

3. A) Answer **any two** of the following : **6**

i) Explain page setup in word document.

ii) Explain Memory unit.

iii) Write a note on ''Applications of Internet''.

B) Explain star topology. State advantages and disadvantages of star topology. **4**

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

i) What is computer ? Draw a block diagram to illustrate the basic organisation of a computer system and explain the functions of various units.

ii) What is network ? Explain the benefits of it.

iii) Explain the characteristics of computer.

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

i) Explain types of computers.

ii) Explain algorithm and flow chart in details.

iii) Explain different communication protocols.

_____

SLR-M – 3

Seat No.	

B.Sc. – I (Semester – I) (C.G.P.A. Pattern) Examination, 2015
BIOTECHNOLOGY
Introduction to Biosciences

Day and Date : Monday, 13-4-2015 Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

N.B. *: 1)* ***All*** *questions are* ***compulsory****.*
2) Answer to the ***both*** *Section are to be written in* ***separate*** *answer book.*
3) ***Draw*** *neat labelled diagram* ***wherever*** *necessary.*
4) Figures to the ***right*** *indicate* ***full*** *marks.*

SECTION – I
(Plant Sciences)

1. Choose the correct answer from given alternatives : **5**

1) Agar (Agar-agar) is obtained from marine algae _____
   a) Sargassum b) Ulva
   c) Gracillaria d) Padina

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

3) Which of the following is a living mechanical tissue ?
   a) Parenchyma b) Aerenchyma
   c) Sclerenchyma d) Collenchyma

4) Conjoint collateral and closed vascular bundles are present in _____
   a) dicot stem b) dicot root
   c) monocot stem d) monocot root

5) _____ is day neutral plant.
   a) Nicotiana tobacum (tobacco) b) Glycine max (soyabean)
   c) Oryza sativa (rice) d) Zea mays (maize)

P.T.O.

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

I) Write any five economic importance of algae.

II) Give any four objectives of plant taxonomy.

III) Write functions of parenchyma.

IV) Enlist types of aestivations.

V) What is parthenocarpy ?

VI) What is intrastelar secondary growth in dicot stem ?

VII) What is vernalization ?

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

i) General characters of Gymnosperms.

ii) Simple fruits with suitable example.

iii) Practical applications of GA.

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

i) Write an account on development of male gametophyte with suitable diagram.

ii) What is photoperiodism ? Describe it with suitable examples.

SECTION – II
(Animal Science)

1. Choose the correct answer from the given alternative : **5**

1) Flat worms are _____

a) Acoelomates b) Pseudocoelomates

c) Partial coelomates d) Eucoelomates

2) Polyps and medusoid phases are found in _____

a) Coelenterata b) Platyhelminthes

c) Aschelminthes d) Annelida

3) To complete the life cycle of Plasmodium vivax only _____ host is required.

a) one b) two

c) three d) four

4) Aristotles lantern is found in _____ phylum.
   a) Arthropoda b) Mollusca
   c) Echinodermata d) Annelida

5) _____ is the process of converting organic waste into vermi compost by the action of earthworms.
   a) Sericulture b) Vermiculture
   c) Aquaculture d) Apiculture

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

i) Write parasitic adaptations in Fasciola hepatica.

ii) Give importance of honey.

iii) Give the general characters of class aves.

iv) Explain the term-Host parasitic interactions.

v) Write on the composition of silk.

vi) Give the economic importance of vermiculture.

vii) What is Agnatha ?

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

i) Describe the life cycle of Bombyx mori.

ii) Write note on maintenance of aquaculture.

iii) Describe the general characters of phylum protozoa. Enlist the classes of it and give on example of each class.

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

i) Describe the life cycle of liver fluke with suitable diagram.

ii) Give an account on Apiculture.

_____

SLR-M – 33

Seat No.	

B.Sc. – II (Biotechnology) (Semester – III) (Old) Examination, 2015
BIOENERGETICS AND METABOLISM – I
(Bioenergetics and Thermodynamics)

Day and Date : Thursday, 7-5-2015 Max. Marks : 50
Time : 3.00 p.m. to 5.00 p.m.

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

1. Write the following sentences by selecting the most correct answer from given options. **10**

1) If free energy of a system is negative, then the reaction is _____

a) Exergonic b) Endergonic

c) Equilibrium d) Spontaneous

2) _____ is the nonprotein part of a conjugated enzyme required for biological activity.

a) Holoenzyme b) Cofactor

c) Isoenzyme d) Apoenzyme

3) _____ enzyme can hydrolyze the glycosidic bonds in peptidoglycan compounds.

a) Lysozyme b) Carboxypeptidase

c) Chymotrypsin d) Amylase

4) Lineweaver-Burk plot is a graph of

a) $V\ V_s \frac{1}{[S]}$ b) $\frac{1}{V}\ V_s[S]$

c) $\frac{1}{V}\ V_s \frac{1}{[S]}$ d) $[V]\ V_s[S]$

P.T.O.

5) Thiamine pyrophosphate [TPP] is the biologically active form of vitamin _____
   a) B – 1 b) B – 2
   c) B – 3 d) B – 12

6) The structure of inhibitor closely resembles the structure of substrate in _____ enzyme inhibition.
   a) Allosteric b) Uncompetitive
   c) Noncompetitive d) Competitive

7) The rates of _____ order reactions do not vary with increasing or decreasing reactant concentrations.
   a) First b) Second
   c) Third d) Zero

8) A system that neither exchanges energy nor matter with its surroundings is called as _____ system.
   a) Open b) Closed
   c) Isolated d) Negative

9) _____ is the measure of randomness of a system.
   a) Enthalpy b) Entropy
   c) Free energy d) V_{max}

10) More _____ the reduction potential, more is the affinity of the species for electrons.
   a) Negative b) Passive
   c) Positive d) Active

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

1) State the relationship between equilibrium constant and standard free energy change.
2) What are limitations of Lineweaver-Burk plot ?
3) Define enzyme activity. How can it be measured ?
4) What is free energy of hydrolysis of ATP ?
5) Differentiate between reversible and irreversible enzyme inhibition.
6) What is entropy ? State second law of thermodynamics.

3. A) Answer **any two** of the following : **6**

   1) What are the different applications of thermodynamics in biochemistry ?

   2) Explain enzyme catalysis on the basis of strain and distortion theory.

   3) What is order of a reaction ? Give kinetics of zero order reaction.

   B) Describe the mechanism of action of chymotrypsin. **4**

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

   1) Describe the phosphate group transfer by high energy phosphate compounds.

   2) Discuss the effect of different physicochemical factors on enzyme activity.

   3) Derive the Michaelis Menten equation for unisubstrate reactions. State the significance of Km.

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

   1) Write an account on ‘enzyme inhibition’.

   2) Write a note on thermodynamic systems and state functions.

   3) Describe biological oxidation reduction reactions. Add a note on ‘redox potential’.

SLR-M – 34

Seat No.	

B.Sc. – II (Semester – III) Examination, 2015
BIOTECHNOLOGY
Immunology – I (Old)
Cells and Organs of Immunity

Day and Date : Friday, 8-5-2015 Max. Marks : 50

Time : 3.00 p.m. to 5.00 p.m.

N. B. *: 1)* ***All*** *questions are* ***compulsory****.*

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

1. Choose the correct alternative and rewrite sentence again : **10**

1) In the adult human, there are about _____ neutrophils in the circulation.

a) 3×10^{14} b) 4×10^{15}

c) 5×10^{10} d) 5×10^{15}

2) T cells mature in _____

a) thymus b) spleen

c) bone marrow d) lymph node

3) The HLA complex of genes is located on the short arm of autosomal chromosome no. _____

a) 9 b) 6

c) 15 d) 12

4) When cytokine producing and target cell is one and same, the action is called as _____

a) endocrine b) paracrine

c) redundant d) autocrine

P.T.O.

5) Complements can be indicated by the suffix 'i', e.g. C3i, where 'i' represents _____ form of complement.

a) inactive b) active

c) both d) none

6) Antigenic determinant are also called as _____

a) adjurant b) epitope

c) paratope d) FCR

7) _____ shows monomeric type of antibody structure.

a) IgD b) IgA

c) IgG d) All of these

8) Diagnosis of syphilis by using _____ test is example of slide Flocculation test.

a) Mancini b) RPR

c) Kahn d) VDRL

9) Widal test is example of _____ test.

a) precipitation b) agglutination

c) electrophoresis d) RIA

10) Small organic molecules that are antigenic but not immunogenic, but becomes immunogenic after coupling with carrier are called as _____

a) epitope b) antigen

c) hapten d) adjurant

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

1) Explain epitopes.

2) Explain ouchterlony procedure.

3) Explain functions of monoclonal antibody.

4) Explain cytokine related diseases.

5) Explain programmed cell death.

6) Explain abzymes.

3. A) Answer **any two** of the following : **6**

   1) Explain structure of class I MHC.

   2) Explain hematopoiesis.

   3) Explain biological functions of antibodies.

   B) Explain the activation of complement by alternative pathway. **4**

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

   1) Explain types of antigens with examples.

   2) Explain structure and functions of IgA antibody.

   3) Write an essay on immuno-electro phoresis.

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

   1) Explain the structure and functions of lymph node.

   2) Write an essay on immuno-diffusion techniques.

   3) Write an essay on cytokine properties and receptors.

SLR-M – 35

Seat No.	

B.Sc. – II (Semester – III) (Biotechnology) Examination, 2015
GENETICS (New)
Inheritance Biology – I

Day and Date : Thursday, 30-4-2015 Max. Marks : 50
Time : 3.00 p.m. to 5.00 p.m.

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

1. Rewrite the sentences by choosing correct alternatives : **10**

1) Mendel's law of segregation is also called as _____
   a) Law of purity of gametes b) Law of independent assortment
   c) Law of dominance d) Law of recessive

2) During _____ , a dominant allele does not mask completely the phenotypic expression of the recessive allele in a heterozygous condition.
   a) co-dominance b) incomplete dominance
   c) mutation d) supplementary gene interaction

3) In monohybrid cross, _____ is the phenotypic ratio.
   a) 3 : 1 b) 1 : 2 : 1 c) 1 : 2 : 2 : 1 d) 2 : 2

4) A human, having 'B' blood group, possesses _____ antibodies in plasma.
   a) Anti – B b) Anti – A, Anti – B
   c) Anti – A d) None

5) The genes which occur in homologous sections of 'X' and 'Y' chromosomes are called _____ genes.
   a) XY-linked b) X-linked c) Y-linked d) Sex

6) The map showing relative distance of linked genes on a chromosome during transference of characters is called _____
   a) Chromosomal map b) Histogram
   c) Allelogram d) Linkage map

7) Male sterility in plants is associated with _____
   a) Stem failure b) Pollen failure
   c) Leaf failure d) Root failure

8) _____ discovered bacterial transformation.
   a) Leeuwenhock b) Griffith c) Soljhenistin d) H. Khorana

P.T.O.

9) A gene or locus which suppresses or masks the action of a gene at another locus is termed as _____
   a) epistatic gene b) hypostatic gene
   c) hyperstatic gene d) mutant gene

10) Eye colour in Drosophila is an example of inheritance of _____ genes.
   a) Y-linked b) XY-linked c) X-linked d) Autosomal

2. Answer the following **(any 5)** : **10**
   1) What are the characters of multiple alleles ?
   2) What is plasmid ?
   3) What are the uses of genetic maps ?
   4) Define the terms gene and allele.
   5) What is dihybrid cross ?
   6) What are sex chromosomes ?

3. A) Answer the following **(any 2)** : **6**
   1) Define crossing over. Describe factors affecting crossing over.
   2) Explain the term pseudoalleles.
   3) Describe the process of conjugation in bacteria.

   B) Describe the mechanism of sex-determination of Drosophila. **4**

4. Answer the following **(any 2)** : **10**
   1) Explain the term co-dominance with an example.
   2) Define multiple alleles. Explain it with the help of four colour in rabbit.
   3) What is linkage ? Explain complete and incomplete linkage.

5. Answer the following **(any 2)** : **10**
   1) Describe the three-point test cross with an example.
   2) What is gene interaction ? Describe complementary gene interaction.
   3) Describe cytoplasmic inheritance with an example.

_____

SLR-M – 37

Seat No.	

B.Sc. – II (Semester – III) (Biotechnology) Examination, 2015
BIOTECHNIQUES (New)
Biophysical Techniques – I

Day and Date : Tuesday, 5-5-2015 Max. Marks : 50
Time : 3.00 p.m. to 5.00 p.m.

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

1. Rewrite the following sentences choosing the correct alternatives : **10**

1) The amount of light absorbed by a material is proportional to the concentration of the absorbing solution is referred as _____
   a) Beer's law b) Lambert's law
   c) Poiseuille's law d) Bouger's law

2) Lead level in drinking water could be determined by using _____
   a) GC-MS b) AAS c) LC-MS d) GLC

3) _____ is the process of enlarging something only in appearance not in physical size.
   a) Resolving power b) Numerical aperture
   c) Magnification d) Focal length

4) _____ is present at the upper end of the body tube.
   a) Mechanical stage b) Nose Piece
   c) Fine adjustment Knob d) Eyepiece

5) A biologically insignificant radioactive isotope is _____
   a) ^{15}O b) ^{35}S c) ^{15}N d) ^{32}P

6) _____ is the method used for measurement of radioactivity based on excitation of gas.
   a) GM counters b) Scintillation counters
   c) Proportional counters d) Ionization chamber

7) Ratio of _____ determines the stability of isotope in nature.
   a) Electron to Proton b) Electron to Neutron
   c) Neutron to Proton d) Meson to Neutron

P.T.O.

8) _____ is the technique responsible for understanding of cellular make up.
   a) Radioactivity
   b) Electrophoresis
   c) Chromatography
   d) Ultra-centrifugation

9) Individual cells can be measured by the technique _____
   a) Flow cytometry
   b) Dosimetry
   c) Colorimetry
   d) Autoradiography

10) X-ray diffraction fails to detect the presence of substances _____
   a) Containing higher concentration of carbon
   b) Comprising less than 5% of a mixture
   c) Containing a magnetic field
   d) Comprising elements with two or more isotopes

2. Answer the following **(any five)** : **10**
   1) Write a short note on electromagnetic spectrum.
   2) Define acids and bases.
   3) Comment on convex lens.
   4) Absorbed dose (D).
   5) Enlist the applications of circular Dichroism.
   6) Properties of alpha(α) particles.

3. A) Answer the following **(any two)** : **6**
   1) Describe pH indicators for pH measurement.
   2) Explain chromatic and achromatic aberrations.
   3) Write a note on swinging bucket rotors.

   B) Discuss ionization chamber for measurement of radioactivity. **4**

4. Answer the following **(any two)** : **10**
   1) Describe the construction of colorimeter.
   2) Discuss construction and working of X-ray difractometer.
   3) Explain image formation in compound light microscope.

5. Answer the following **(any two)** : **10**
   1) Explain in detail atomic absorption spectroscopy.
   2) Describe analytical ultracentrifugation.
   3) Discuss GM counters for measurement of radioactivity and enlist the biological applications of radioisotopes.

_____

SLR-M – 38

Seat No.	

B.Sc. – II (Sem. – III) (Biotechnology) Examination, 2015
BIOTECHNIQUES (New)
Biochemical Techniques – II

Day and Date : Wednesday, 6-5-2015 Max. Marks : 50
Time : 3.00 p.m. to 5.00 p.m.

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

1. Rewrite the following sentences by choosing correct alternative. **10**

1) Paper used for paper electrophoresis consist of _____ of cellulose.
a) 50% b) 95% c) 75% d) 82%

2) Purpose of using stacking gel is to _____ proteins.
a) Analyse b) Distribute
c) Concentrates d) Separate

3) Usually in paper chromatography stationary phase is _____
a) Acid b) Base c) Alcohol d) Water

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

5) _____ is faster a purification technique than dialysis.
a) Cell disruption b) Ultra filtration
c) Ultra centrifugation d) Immobilization

6) The first working dialyser was constructed by
a) Dr. Ronald Ross b) Dr. Moris Wilkins
c) Dr. Willem Kolff d) Dr. Nakamura

7) _____ is the process in which proteins are denatured and precipitated in large insoluble aggregates within the gel matrix.
a) Staining b) Blocking c) Blotting d) Fixing

8) In _____ precipitation we preserve biological activity of proteins.
a) Ammonium sulphate b) Acetone
c) Chloroform : methanol d) 10% trichloroacetic acid

P.T.O.

9) _____ involves quantitative study of global changes in protein expression in cell a tissue.
   a) Protein interaction mapping b) Protein expression mapping
   c) Protein microarray d) Protein precipitation

10) _____ creates ions by holding a liquid at high potential difference.
   a) Atmospheric pressure ionization
   b) Atmospheric pressure chemical ionization
   c) Electrospray ionization
   d) Atmospheric pressure photo ionization

2. Answer the following (**any five**) : **10**
   1) How sample affect its own electrophoretic mobility ?
   2) Column used in column chromatography.
   3) Cell disruption by enzymes.
   4) Write the principle of Bradford assay.
   5) Write a note on protein expression mapping.
   6) Enlist the methods of immobilization and explain adsorption method.

3. A) Answer the following (**any two**) : **6**
   1) Explain the principle of gel permeation chromatography.
   2) Explain ammonium sulphate precipitation of proteins.
   3) Write a note on blocking of proteins.

   B) Discuss blotting of proteins w.r.t. protein determination. **4**

4. Answer the following (**any two**) : **10**
   1) Explain the technique of DNA blotting.
   2) Discuss mass spectrometers for proteomics study.
   3) Discuss ultrasonication and enlist the methods of cell disruption.

5. Answer the following (**any two**) : **10**
   1) Describe electrophoretic technique for protein which use pH gradient for separation.
   2) Discuss chromatographic technique for separation which uses biological interaction between biomolecules.
   3) Explain methods of sample preparation for MALDI.

_____

SLR-M – 39

Seat No.	

B.Sc. – II (Semester – III) (Biotechnology) (New) Examination, 2015
IMMUNOLOGY
Cell and Organs of Immunity – I

Day and Date : Thursday, 7-5-2015 Max. Marks : 50
Time : 3.00 p.m. to 5.00 p.m.

N. B. *: 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 sentence again : **10**

1) Hematopoietin is playing role in _____ production.

a) neutrophil b) erythrocyte c) platelet d) mast cell

2) CD4 cells are _____ cells.

a) T_D b) T_C c) T_S d) T_H

3) Factor H and I are the _____ of complement activation by alternative pathway.

a) inhibitors b) activators c) promotors d) cofactors

4) When cytokine producing cell and target cell is same action is called _____

a) endocrine b) autocrine c) paracrine d) redundant

5) Seven pass trans-membrane polypeptides are classified as type _____ cell surface proteins.

a) II b) III c) IV d) V

P.T.O.

6) Selectins are adherence proteins that binds to _____

a) addressins b) cadherins

c) integrins d) adhesins

7) T cell epitopes will be _____ antigens.

a) Soluble b) Hydrophilic

c) BCR presented d) MHC presented

8) _____ is required for BCR formation.

a) IgD b) mIgM

c) Both of these d) None of these

9) Lissamine rhodomine is used in _____

a) ELISA

b) RIA

c) Immunofluorescence test

d) Complement fixation test

10) Horse radish peroxidase is used in _____

a) Immuno electrophoresis b) ELISA

c) RIA d) VDRL test

2. Define and explain **any five** of the following : **10**

1) Apoptosis

2) Immunogenicity

3) Cytokines

4) Agglutination

5) Complete antigen

6) Exocytosis.

3. A) Write short note on **any two** : **6**
   1) Structure of MHC class II
   2) Counter current immunoelectrophoresis
   3) Types of antigen.

   B) Write briefly on the cytokine receptors. **4**

4. Answer **any two** of the following : **10**
   1) Write an essay on classical pathway for complement activation.
   2) Write an essay on structure and function of spleen.
   3) Write an essay on ELISA.

5. Answer **any two** of the following : **10**
   1) Write an essay on structure and functions of IgA.
   2) Write an essay on complement fixation test.
   3) Write an essay on cell surface proteins.

SLR-M – 4

Seat No.	

B.Sc. – I (Semester – I) Examination, 2015
BIOTECHNOLOGY (CGPA Pattern)
Fundamentals of Chemistry and Biophysics

Day and Date : Thursday, 16-4-2015 Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

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

SECTION – I
(Chemical Science)

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

   i) Two Cl atoms are joined by _____ bond in Cl_2 molecule.
   a) ionic b) covalent
   c) co-ordinate d) metallic

   ii) Formation of ethane molecule involves _____ hybridization of carbon.
   a) SP b) SP^2
   c) SP^3 d) SP^3d

   iii) Entropy of universe tends towards _____
   a) Maximum b) Minimum
   c) Both a) and b d) None of these

   iv) $H_2 + I_2 \rightarrow 2HI$ is _____ reaction.
   a) unimolecular b) bimolecular
   c) termolecular d) psedounimolecular

   v) Glass electrode is selective for _____ ions.
   a) K^+ b) H^+
   c) Mg^{++} d) Cs^+

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

   i) Define the term dipole moment and give its significance.
   ii) What is hybridization ? Mention its types.
   iii) What is intramolecular hydrogen bonding ? Give one example.
   iv) What is colligative property ? Mention two examples.

P.T.O.

v) Define the terms order and molecularity of reaction.

vi) What is Gibbs free energy ? How it is symbolized.

vii) Explain common ion effect.

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

i) What are ionic solids ? Give examples and write their general characteristics.

ii) Time for half change in a first order reaction is 25 min. How much it will take to complete 99.9%.

iii) Explain the terms osmosis and reverse osmosis with examples.

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

i) What are different types of electrodes ? Give construction and working of glass electrode.

ii) Define catalysis. Explain its types, give examples and characteristics of enzyme catalyzed reaction.

SECTION – II
(Biophysics)

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

i) The phenomenon of bending of path of light waves at an edge of obstacle is called _____

a) reflection b) diffraction
c) refraction d) interference

ii) Ink rises in a pen due to _____

a) viscosity b) capillary action
c) elasticity d) none of these

iii) _____ indicates the resistance of elastic solid to elongation.

a) Bulk modulus b) Elastic limit
c) Young's modulus d) Modulus of rigidity

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

a) zero b) acute
c) right angle d) obtuse

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

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

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

   i) Define (a) Surface tension (b) Angle of contact.

   ii) Define (a) Stress (b) Strain.

   iii) What is the effect of pressure on viscosity of a liquid ?

   iv) State the relation between surface tension, excess pressure and radius of curvature.

   v) State Hooke's law.

   vi) Define coefficient of viscosity.

   vii) What do you mean by (a) Mechanical waves (b) Electromagnetic waves ?

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

   i) Explain the working of Pitot tube.

   ii) What is elasticity ? Explain the importance of elasticity.

   iii) Discuss the factors affecting surface tension.

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

   i) Describe construction and working of Helium – Neon Laser.

   ii) How beats are formed ? Obtain an expression for frequency of beats.

SLR-M – 40

Seat No.	

B.Sc. – II (Semester – III) Examination, 2015
BIOTECHNOLOGY (New)
Immunology
Immune Effector Mechanisms – II

Day and Date : Friday, 8-5-2015 Max. Marks : 50
Time : 3.00 p.m. to 5.00 p.m.

N.B. *: 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 sentence again : **10**

1) Secondary Immune response is characterised by the production of _____ types of antibodies.
   a) IgG b) IgM
   c) IgA d) IgD

2) Live attenuated vaccines can develop _____ types of immunity.
   a) Humoral b) Cellular
   c) Both humoral and cellular d) None of these

3) The antigens involved in the rejection of graft are called _____
   a) Autoantigens b) Heterophile antigen
   c) MHC antigens d) Proantigens

4) BCG vaccine is _____
   a) Live attenuated b) Killed
   c) Toxoid d) Recombinant

5) Rheumatoid arthritis is _____ type of autoimmune disease.
   a) Organ specific b) Non-organ specific
   c) Hemolytic d) None of these

P.T.O.

6) Passive immunisation is done by using _____

a) Vaccines b) Toxoids

c) Immunesera d) Toxins

7) _____ antibody is called as reagin type.

a) IgG b) IgM

c) IgD d) IgE

8) Pollen grains acts as allergen entered into body of host via _____ route.

a) Urinogenital b) Respiratory

c) Gastrointestinal d) None of these

9) Second dose of same antigen enters into body of the host in hypersensitivity is called as _____

a) Priming dose b) Sensitising dose

c) Shocking dose d) None of these

10) The blood group determining antigens are present on _____

a) WBCs b) RBCs

c) Platelets d) None of these

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

1) Define acquired immunity and give its types.

2) Define and explain vaccination.

3) Define and explain isograft.

4) Define precipitation and agglutination.

5) Write applications of monoclonal antibodies.

6) Give Gell and Coomb's classification of hypersensitivity reactions.

3. A) Answer **any two** of the following : **6**

   1) Explain mechanism of phagocytosis.

   2) Explain Live-attenuated vaccines with an example.

   3) Write an applications of monoclonal antibodies.

   B) Explain physical barriers of immune system. **4**

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

   a) Write in brief on monoclonal antibody synthesis.

   b) Write the general mechanism of autoimmunity.

   c) Explain B cell maturation, activation and differentiation.

5. Write **any two** of the following : **10**

   a) Explain ABO and Rh blood group system and its significance.

   b) Write in brief on anaphylaxis.

   c) Write in brief on mechanism of allograft rejection.

SLR-M – 41

Seat No.	

B.Sc. – II (Semester – IV) (New) Examination, 2015
BIOTECHNOLOGY
Molecular Biology
Molecular Biology of Gene

Day and Date : Saturday, 9-5-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the sentences using correct alternatives. **10**

1) DNA is polymer of _____
   a) Protein b) Carbohydrate
   c) RNA d) Nucleotide

2) Nitrogen bases of RNA are _____
   a) AVTG b) AVCG c) AVTC d) ATCG

3) _____ is the usual method of DNA replication.
   a) Dispersive b) Conservative
   c) Semiconservative d) Non-conservative

4) An isolated DNA kept at 82 – 90°C _____
   a) two strands uncoil and separate
   b) fragmentation occurs
   c) thymine is replaced by uracil
   d) the structure is stabilised

5) Leading strand during DNA replication is formed _____
   a) continuously b) in short segments
   c) first d) ahead of replication

6) Topoisomerase is involved in _____
   a) producing RNA primer
   b) joining of DNA segments
   c) producing nick in DNA and removes +ve supercoils
   d) separation of DNA strand

P.T.O.

7) The area of unwinding and separation of DNA strands during replication is called _____
   a) origin b) initiation point
   c) primer d) replication fork

8) Base pairing of DNA does not prove that _____
   a) A/T is one b) C = G
   c) Pu = Py d) A + T $\neq$ C + G

9) In Z-DNA one complete turn of helix is _____
   a) 40 A° b) 45 A° c) 34 A° d) 38 A°

10) Genetic code determines _____
   a) sequence of aminoacids in a protein
   b) number of variations of offsprings
   c) constancy of morphological traits
   d) structural pattern of organism

2. Answer the following (**any 5**) : **10**
   1) What are okazaki-fragments ?
   2) What is the function of primase and DNA polymerase ?
   3) What is central dogma ?
   4) Write a note on-cot curves.
   5) Describe the organisation of DNA in viruses.
   6) Give the schematic diagram to show semi-conservative nature of DNA replication.

3. A) Answer the following (**any 2**) : **6**
   1) Describe the SOS repair mechanism of DNA.
   2) What is RNA ? Describe its structure.
   3) How did Hershey and Chase prove that DNA is the genetic material ?

   B) Who demonstrated the semiconservative replication of DNA ? Explain the experiment in detail. **4**

4. Answer the following (**any 2**) : **10**
   1) Describe the structure of mitochondrial DNA.
   2) Describe in detail the structure of DNA proposed by Watson and Crick.
   3) Describe in brief various types of DNA damages.

5. Answer the following (**any 2**) : **10**
   1) Describe rolling circle model of replication.
   2) Write a note on eukaryotic DNA polymerases.
   3) Describe properties of genetic code.

_____

SLR-M – 42

Seat No.	

B.Sc. – II (Semester – IV) Examination, 2015
BIOTECHNOLOGY (New)
Molecular Biology
Gene Regulation

Day and Date : Monday, 11-5-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the sentences using correct alternatives : **10**

1) Nuclear DNA sends information for protein synthesis with the help of _____
   a) tRNA b) mRNA c) rRNA d) all of these

2) Lac operon of E. coli is of _____ type.
   a) Monocistronic b) Inducible c) Repressible d) Both a) and c)

3) Transcription involves synthesis of _____
   a) tRNA b) mRNA c) rRNA d) all of these

4) Enzymes required for transcription is _____
   a) RNA-ase b) Transnuclease
   c) RNA polymerase d) DNA-polymerase

5) t-RNA attaches amino acid at its _____
   a) 3′ end b) 5′ end c) Anticodon d) Loop

6) Inducible and Represser operon are respectively _____
   a) Lac operon and Tryptophan operon
   b) Lac operon in both
   c) Tryptophan operon both type
   d) None of these

7) During elongation of polypeptide chain sigma factor is _____
   a) Functionless b) Released for re-use
   c) Retained for specific function d) Required during closing of chain

P.T.O.

8) RNA polymerase I transcribes _____
   a) m-RNA b) r-RNA c) t-RNA d) sn-RNA

9) Those stretches of DNA that do code for amino acids in the protein are called _____
   a) Introns b) Poly A tail c) Exons d) Split gene

10) The removal introns from exons is done with the _____
   a) Spliceosome b) RNA polymerase
   c) DNA polymerase d) Proteinases

2. Answer the following **(any 5)** : **10**
   1) What are split genes ?
   2) Write a note on ribosome structure.
   3) What is Fidelity of translation ?
   4) What are transcriptional repressors ?
   5) Describe regulation of Trp operon.
   6) What are introns and exons ?

3. A) Answer the following **(any 2)** : **6**
   1) Describe the process of initiation of transcription in prokaryotes.
   2) Write a note on eukaryotic RNA polymerases.
   3) Describe various inhibitors of protein synthesis.

   B) Describe the steps involved in protein synthesis in eukaryotes. **4**

4. Answer the following **(any 2)** : **10**
   1) Describe Lac Operon in detail.
   2) Describe the process of transcription in eukaryotes.
   3) Describe translation-dependent regulation of m-RNA and add a note on protein stability.

5. Answer the following **(any 2)** : **10**
   1) What is conserved mechanism of regulation ?
   2) Describe the RNA processing in eukaryotes.
   3) Explain with an example the signal transduction in transcriptional regulation.

_____

SLR-M – 43

Seat No.	

B.Sc. – II (Biotechnology) (Semester – IV) (New) Examination, 2015
TISSUE TECHNIQUES
Plant Tissue Culture

Day and Date : Tuesday, 12-5-2015 Total Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

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

1) The part of a plant used for culturing is called _____
   a) Callus b) Scion
   c) Stock d) Explant

2) Indole-Acetic Acid (IAA) is a form of _____ hormone.
   a) Auxin b) Cytokinin
   c) Ethylene d) Florigen

3) Elements required by plants in higher concentration than 0.5 mmol/liter referred as _____
   a) Vitamins b) Cofactors
   c) Macromolecules d) Micromolecules

4) Ethylene is employed for _____
   a) Ripening of fruit b) Stimulation of cell division
   c) Increasing light d) Root growth

5) In suspension culture, _____ the type of batch culture.
   a) Slowly rotating culture b) Spinning culture
   c) Shake culture d) All of these

6) Callus turns into yellow colour due to presence of _____ pigments.
   a) Anthocyanin b) Chloroplast
   c) Phenols d) Carotenoid

P.T.O.

7) In protoplast isolation _____ is used as plasmolyticum.
   a) 13% mannitol b) Cellulase
   c) Pectinase d) Gibberellins

8) _____ is the variation which occurs in plants during tissue culture.
   a) Somatic Hybrid b) Cybrid
   c) Somaclonal variation d) Callus

9) _____ is used for preparation of synthetic seeds.
   a) Agar b) Ca2 + ions
   c) Sodium alginate d) Difco agar

10) For protoplast culture _____ medium is used.
   a) Nagata and Takebe b) White
   c) Haberlandt d) MS

2. Answer the following (**any 5**) : **10**
   1) Define organogenesis.
   2) What are Embryoids ?
   3) Define Totipotency.
   4) What is protoplast culture ?
   5) Define Cybrid.
   6) Enlist any two names of surfactants used in plant tissue culture.

3. A) Answer the following (**any 2**) : **6**
   1) Write a note on culture room.
   2) Write the applications of somatic embryogenesis.
   3) Explain briefly the cytodifferention in callus formation.

   B) Write in brief the isolation of protoplast by enzymatic method. **4**

4. Answer **any two** of the following : **10**
   1) Give detail account on plant tissue culture laboratory.
   2) Give detail account on culture medium and nutritional requirements of the explants in tissue culture.
   3) Briefly write on suspension culture.

5. Answer **any two** of the following : **10**
   1) Write a note on haploid culture.
   2) Write general account on somaclonal variation.
   3) Give a detail account on plant growth regulators.

_____

SLR-M – 44

Seat No.	

B.Sc. – II (Biotechnology) (Semester – IV) Examination, 2015
TISSUE TECHNIQUES
Animal Tissue Culture (New)

Day and Date : Wednesday, 13-5-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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) Culture of _____ is more difficult than micro-organisms.
   a) Animal cell b) Plant cell c) Yeast cell d) Fungus cell

2) Hella cell line is derived from _____ cell line.
   a) Stomach b) Cervical c) Lung d) Blood

3) Which of the following behavior not shown by normal cell in culture ?
   a) Contact inhibition b) Monolayer formation
   c) Uncontrolled cell division d) Encourage dependent

4) Along with nutritional and hormonal factors _____ factor is also essential for survival of cell in culture.
   a) Insulin b) Lipids c) Proteins d) Stromal

5) Plasma clot technique is also known as _____ technique.
   a) Watch glass b) Grid c) Raft d) Cyclic exposure

6) In primary culture, cell divide to give same type of cells by _____ process.
   a) Differentiation b) Proliferation
   c) Cultivation d) Initiation

7) When all the cells in culture are in same phase of growth; the process is known as _____
   a) Trypsinization b) Primary cell culture
   c) Cell synchronization d) Apoptosis

8) Colony formation at low cell density or _____ is the preferred method for analyzing cell proliferation and survival.
   a) Trypsinization b) Apoptosis
   c) Cell migration d) Plating efficiency

9) _____ portion of skin is used to produce artificial skin.
   a) Epidermis b) Dermis c) Epithelial d) Endothelial

10) In primary cell culture cell divide to give different type of cell by _____ process.
   a) Cultivation b) Differentiation
   c) Initiation d) Proliferation

2. Answer the following (**any five**) : **10**
   1) Write a note on history of ATC.
   2) Describe in brief laminar air flow.
   3) Define primary cell culture.
   4) Write a note on plating efficiency of cultured cells.
   5) Explain in brief monoclonal antibodies.
   6) Write a note on washing of glasswares.

3. A) Answer the following (**any two**) : **6**
   1) Write a note on morphology of cultured cells.
   2) Write a note on cultured based vaccine.
   3) Explain in brief BSS.

   B) Explain physiological media components. **4**

4. Answer the following (**any two**) : **10**
   1) Describe the culture of stem cells.
   2) Explain equipments used in animal cell culture.
   3) Give details of cell synchronization.

5. Answer the following (**any two**) : **10**
   1) Discuss in detail synthetic media.
   2) Describe in detail measurement of senescence.
   3) Give details of applications of animal cell culture.

_____

SLR-M – 45

Seat No.	

B.Sc. – II (Semester – IV) (Biotechnology) Examination, 2015
METABOLISM – I (New)
Bioenergetics and Enzymology

Day and Date : Thursday, 14-5-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Write following sentences selecting most correct answer from given options : **10**

1) Ribozymes are _____ in nature that function like enzymes.
a) Proteins b) DNA c) RNA d) Polysaccharides

2) From thermodynamic point of view, biological cell is _____ system.
a) Closed b) Open c) Adiabatic d) Isolated

3) For exothermic reactions enthalpy change of a system (Δ H) is always _____
a) > 0 b) = 0 c) < 0 d) constant

4) Condensation reaction between aldehyde and alcohol groups of two organic compounds is called _____
a) Clasein condensation b) Aldol condensation
c) Internal arrangement d) Group transfer reaction

5) Lipmann first demonstrated that _____ functions in cyclic manner to transfer energy from catabolic to anabolic reactions.
a) Phosphoenol pyruvate b) Phosphocreatine
c) Phosphoarginine d) Adenosine triphosphate

6) When an enzyme exists in more than one molecular forms in the same organism, it is called as _____
a) Coenzyme b) Holoenzyme
c) Apoenzyme d) Isoenzyme

7) Oxidising agents are the substances which _____ in reaction.
a) are oxidised b) gain electrons
c) furnish electrons d) gain protons

P.T.O.

8) Malonic acid reversibly inhibits the action of _____ enzyme.
   a) fumarase b) citrate synthase
   c) succinate dehydrogenase d) malate dehydrogenase

9) Lactate dehydrogenase enzyme is composed of _____ sub units.
   a) 2 b) 4 c) 5 d) 6

10) Induced fit hypothesis of enzyme catalysis was proposed by _____
   a) Koshland b) Emil Fischer
   c) Lineweaver and Burk d) Enzyme Commission

2. Answer **any five** from below : **10**

1) State second law of thermodynamics. Give one example.
2) What is meant by standard free energy of a system ?
3) What are the drawbacks of Lock and Key mechanism for enzyme catalysis ?
4) What is absolute specificity of an enzyme ? Give one example.
5) What are coenzymes ? Give suitable examples.
6) Write and describe isomerisation reaction.

3. A) Answer **any two** : **6**

1) Using Michaelis-Menten equation, derive Lineweaver-Burk plot equation.
2) Describe phosphoenol pyruvate as a high energy compound.
3) With suitable example write about biological half reaction.

B) How enzymes accelerate the reaction rate ? **4**

4. Attempt **any two** : **10**

1) How are enzymes classified ? Discuss each class in brief.
2) Derive Michaelis-Menten equation.
3) Discuss various modes of enzyme regulation.

5. Answer **any two** from below : **10**

1) Write an account of high energy compounds of cell.
2) Discuss different types of enzyme inhibition.
3) Explain the role of various compounds involved in electron transport chain.

_____

SLR-M – 46

Seat No.	

B.Sc. – II (Biotechnology) (Semester – IV) Examination, 2015
METABOLISM – II (New)

Day and Date : Friday, 15-5-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

N. B. : *1)* ***All*** *questions are* ***compulsory****.*
2) Figures to the ***right*** *indicate* ***full*** *marks.*
3) Write biochemical reactions ***wherever*** *necessary.*

1. Write the following sentences by choosing the most correct alternative from given options : **10**

1) Succinyl – CoA is cleaved by _____ enzyme in TCA cycle.
   a) Succinate dehydrogenase
   b) Succinate thiokinase
   c) Succinate lyase
   d) Succinate thioesterase

2) The reaction of conversion of isocitrate to α-ketoglutarate in TCA cycle is _____
   a) Oxidative decarboxylation
   b) Condensation
   c) Dehydrogenation
   d) Substrate level phosphorylation

3) The conversion of _____ in glycolysis is an irreversible step.
   a) Glucose 6 phosphate to fructose 6-phosphate
   b) Glyceraldehyde 3-phosphate to dihydroxyacetone phosphate
   c) 3-phosphoglycerate to 2-phosphoglycerate
   d) Fructose 6-phosphate to fructose 1, 6-bisphosphate

P.T.O.

4) _____ is the first stable product formed in C3 pathway of CO_2 fixation.
   a) Phosphoglyceric acid b) Phosphoglyceraldehyde
   c) Oxaloacetate d) Ribulose bisphosphate

5) The photorespiration yields _____
   a) Phosphoglycerate b) Phosphoglycolate
   c) Both a) and b) d) None of these

6) _____ contributes nitrogen atoms in the biosynthesis of purine and pyrimidine rings.
   a) Aspartate b) Carbamoyl phosphate
   c) Carbon dioxide d) Glutamine

7) _____ is the end-product of purine catabolism in human.
   a) CO_2 b) Lactic acid
   c) Ethanol d) Uric acid

8) _____ molecules of ATP can be derived from each acetyl CoA molecule entering the Kreb's cycle.
   a) 6 b) 12 c) 18 d) 38

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

10) _____ is the prosthetic group of NADH-COQ reductase.
   a) Heme b) NADP c) FMN d) Mg^{++}

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

1) Define glycolysis and give its energetics.
2) Write about the inhibitors of electron transport chain.
3) Define photosystem and differentiate between PS-I and PS-II.
4) Give an outline of amino acid biosynthesis.
5) Write about oxidation of fatty acids containing odd numbered carbon chains.
6) How are the fatty acids transported into mitochondria ?

3. A) Answer **any two** of the following : **6**

   1) Describe the ATP synthetase complex.

   2) Write a note on glycogen synthesis.

   3) Describe the regulation of cholesterol metabolism.

   B) Discuss the fates of pyruvate during metabolism. **4**

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

   1) Write an account on pentose phosphate pathway.

   2) Discuss the biosynthesis of purine nucleotides.

   3) Describe the TCA cycle and explain how it is regulated.

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

   1) Explain the mechanism of CO_2 fixation in C_4 plants.

   2) Write an account on beta oxidation of fatty acids.

   3) Discuss in detail the light reaction of photosynthesis.

SLR-M – 47

Seat No.	

B.Sc. – II (Sem. – IV) Examination, 2015
BIOTECHNOLOGY
Genetics – II (Old)
Microbial Genetics

Day and Date : Saturday, 9-5-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the following sentences by choosing correct alternative : **10**

1) pUC 18 is a _____
   a) restriction enzyme b) vector
   c) polymerase d) ligase

2) Bacteria reproduce sexually by _____
   a) Conjugation b) Transduction
   c) Transformation d) Recombination

3) Transformation experiment was performed on which bacteria _____
   a) E. Coli b) Diplococcus pneumonia
   c) Salmonella d) B. Subtilis

4) The transfer of genetic material between bacteria is carried out by some external agency is called _____
   a) translation b) transformation
   c) transduction d) conjugation

5) Plasmid is a _____
   a) double stranded circular DNA
   b) single stranded DNA
   c) extrachromosomal linear DNA
   d) all of the above

6) _____ acts as a genetic vector.
   a) plasmid b) cosmid c) phage d) all of the above

P.T.O.

7) The term transposable element was coined by _____
   a) Alexander Brink b) Barbara M. Clintock
   c) James Shapiro d) Michael Young

8) _____ mutation results in the death of the cell or organism.
   a) Lethal b) Subvital c) Vital d) Super vital

9) The transposons are referred as _____
   a) special DNA b) general DNA
   c) selfish DNA d) none of these

10) Acridine causes _____
   a) Transitions b) Transversions
   c) Substitution mutation d) Frame shift mutation

2. Define **any five** : **10**

   1) Temperate phage
   2) Origin of replication
   3) Inverted repeats
   4) Episomes
   5) Mustard gas
   6) Competency.

3. A) Answer **any two** of the following : **6**
   1) Write a note on detection of plasmid DNA.
   2) Explain generalized transduction.
   3) Write a note on drug resistant mutants.

   B) Explain excision of transposons. **4**

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

   1) Explain in detail the mechanism of transformation.
   2) Describe in detail homologous recombination
   3) Explain analysis mutations in biochemical pathway

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

   1) Describe the types and properties of the plasmid.
   2) Define mutation. Explain induced mutation.
   3) Explain the genetic phenomenon mediated by transposons.

_____

SLR-M – 48

Seat No.	

B.Sc. (Part – II) (Semester – IV) Examination, 2015
BIOTECHNOLOGY
Molecular Biology – II (Gene Regulation and Expression) (Old)

Day and Date : Monday, 11-5-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the sentence using correct alternative given below : **10**

1) In eukaryotic transcription process, _____ is responsible for mRNA synthesis.
a) RNA Pol I b) RNA Pol II c) RNA Pol III d) Poly A RNA Pol

2) In prokaryotic transcription process _____ is responsible for binding a promoter region.
a) σ factor b) rho factor c) TF – II D d) EL II D

3) In lac operon, regulatory protein binds to _____ sequences.
a) Promoter b) Operator c) Terminator d) Attenuator

4) _____ is inhibitor of transcription process.
a) Streptomycin b) Actinomycin c) Ampicillin d) Tetracycline

5) _____ is transcribed but not translated.
a) tRNA b) mRNA c) rRNA d) Both a) and c)

6) _____ is not a termination codon.
a) AUG b) UAG c) UGA d) UAA

7) In lac operon Lac y gene encodes_____
a) Galactosidase b) Permease c) Transacetylase d) Lactamase

8) Shine Dalgarno sequences are known as _____
a) Initiator sequences b) Ribosome binding site
c) Promoter sequences d) Operator sequences

9) Attachment of carbohydrates to proteins is known as _____
a) Glycosylation b) Glycolysis c) Glycogenosis d) Glyconeogenesis

10) A cistron refers to _____
a) Coding region b) Non-coding region
c) Mutated region d) Replicative region

P.T.O.

2. Answer **any five** of the following : **10**
   i) Sn RNPs
   ii) trpE
   iii) 16S rRNA
   iv) Streptomycin
   v) Heat shock proteins
   vi) Regulator protein.

3. A) Answer **any two** of the following : **6**
   i) Write a note on mRNA splicing.
   ii) Add a note on termination of transcription in prokaryotes.
   iii) Structure of tRNA molecule.

   B) Describe structure and function of ribosomes. **4**

4. Answer **any two** of the following : **10**
   i) Describe the mechanism of transcription in eukaryotes.
   ii) Explain the mechanism of translation in prokaryotes.
   iii) Explain the regulation of Lac operon.

5. Answer **any two** of the following : **10**
   i) Write a note on post translation modification in eukaryotes.
   ii) Add a note on factors involved in prokaryotic transcription.
   iii) Explain Trp operon in detail.

SLR-M – 49

Seat No.	

B.Sc. – II (Semester – IV) (Biotechnology) Examination, 2015
METHODS IN BIOTECHNOLOGY – II (Old)
Biochemical Techniques

Day and Date : Tuesday, 12-5-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Write the following sentences by selecting most correct answer from given alternatives. **10**

i) The paper electrophoresis is a _____ type of electrophoresis.
   a) moving boundary b) zone
   c) vertical d) all a), b) and c)

ii) The chemical nature of agarose used in electrophoresis is _____
   a) polysaccharide b) polypeptide
   c) glycoprotein d) glycolipid

iii) In isoelectric focusing, proteins present in mixture will migrate to _____ and stop migration at that point.
   a) cathode b) anode
   c) its isoelectric point d) opposite end of sample loading

iv) In ascending paper chromatography the flow of mobile phase is always from _____
   a) top to bottom b) bottom to top
   c) right to left d) left to right

v) _____ chromatographic separation of macromolecules is based only on molecular size.
   a) Thin layer b) Ion-exchange
   c) Affinity d) Gel permeation

P.T.O.

vi) _____ is used for protein assay.

a) Biuret method
b) Antrone method
c) DNSA method
d) Phenol-H_2SO_4 method

vii) In native gel system used in proteomics all of the following are present except _____

a) Triton X-100
b) Acryl amide
c) Bis-acrylamide
d) SDS

viii) _____ of ions are measured by TOF analyzers of MALDI mass spectrometer.

a) Mass
b) Charge
c) Flight time
d) Geometry

ix) The second electrophoresis in 2-D-gel electrophoresis is always _____

a) isoelectric focusing
b) capillary electrophoresis
c) paper electrophoresis
d) SDS gel electrophoresis

x) The protein is concentrated by _____ method/s.

a) freeze drying
b) centrifugation
c) dialysis
d) all a, b, and c

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

i) What is a stacking gel ? Why is it used in electrophoresis ?
ii) Distinguish between cation exchanger and anion exchanger.
iii) Give the role of SDS in electrophoresis.
iv) Define the terms – Proteome, Proteomics.
v) State the applications of western blotting technique.
vi) Explain the Ca^{2+} binding in blotting.

3. A) Answer **any two** of the following : **6**
   i) What is the principle of affinity chromatography ? Give the properties of matrix used in it.
   ii) Describe the auto radiography of gels and blots.
   iii) Illustrate Edman degradation method used in protein sequencing.

   B) Write a note on working of starch gel electrophoresis. **4**

4. Answer **any two** of the following : **10**
   i) Describe in detail thin layer chromatography.
   ii) Explain the principles of different assay methods used in protein determination.
   iii) Discuss in detail 2-D-gel electrophoresis.

5. Answer **any two** of the following : **10**
   i) With neat and labelled diagram describe Southern blotting technique.
   ii) Illustrate the instrumentation of HPLC.
   iii) Give a brief account of immunostaining method used in blotting.

———————

SLR-M – 5

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) Examination, 2015
(CGPA Pattern)
CELL BIOLOGY AND BIOSTATISTICS

Day and Date : Saturday, 18-4-2015 Max. Marks : 70
Time : 11.00 a.m. to 2.00 p.m.

N. B. *: 1)* ***All*** *questions are* ***compulsory****.*
2) Draw a ***neat*** *labelled diagram* ***wherever*** *necessary.*
3) Figures to the ***right*** *indicates* ***full*** *marks.*
4) ***Use*** *of calculator is* ***allowed****.*

SECTION – I
(Cell Biology)

1. Multiple choice questions : **5**

1) _____ is known as power houses of cell.
a) Mitochondria b) RER c) Plastid d) Ribosome

2) _____ is termed as equational division.
a) Necrosis b) Apoptosis c) Mitosis d) Meiosis

3) _____ is act as initiation codon in translation.
a) UUA b) AUG c) UGA d) UAG

4) Uncontrolled cell division is known as _____
a) Cell division b) Mitosis c) Cancer d) Meiosis

5) _____ is an example of active transport.
a) Simple diffusion b) Osmosis
c) Facilitated diffusion d) Proton pump

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

i) Mycoplasma

ii) Types of plastids

iii) Applications of cell synchrony

iv) Polytene chromosome

P.T.O.

v) Unit membrane model of plasma membrane

vi) Synaptic signalling

vii) Components of protein biosynthesis.

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

i) Generalized structure of animal cell.

ii) Describe structure, types and function of chromosome.

iii) Describe structure of desmosomes and hemidesmosomes.

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

i) Describe protein trafficking in nucleus and mitochondria.

ii) Explain ultrastructure of eukaryotic cell wall and add a note on its functions.

SECTION – II
(Biostatistics)

1. Multiple choice questions : **5**

1) The sum of deviations of all the observation from arithmetic mean is always _____

a) Positive b) Negative

c) Zero d) None of these

2) A curve which is more peaked than the normal curve is called _____

a) Mesokurtic b) Platykurtic

c) Leptokurtic d) None of these

3) If _____ then it indicates that there is no linear relationship between the two variable.

a) $r = +1$ b) $r = -1$ c) $r = 0$ d) None of these

4) If two events A and B are independent then the probability that they will both occur is given by _____

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

c) $P(A) - P(B)$ d) $P(A)/P(B)$

5) In _____ distribution, the mean and the variance are equal.

a) Binomial b) Poisson

c) Normal d) None of these

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

   1) Define mean deviation about median.

   2) Define Binomial distribution.

   3) If variance = 16.4 and mean = 25 calculate coefficient of variation.

   4) If p = 0.4, E(X) = 2 find n and Var(X).

   5) The mean and standard deviation of 100 observations is 45 and 10 respectively. Find the new mean and standard deviation if each observation is increased by 5.

   6) Define parameter and statistic.

   7) Merits and demerits of median.

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

   i) Explain median by graphical method.

   ii) Explain Kurtosis.

   iii) Explain correlation by scatter diagram method.

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

   1) Calculate standard deviation and coefficient of variation for the following frequency distribution :

Marks	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
No. of Students	5	12	32	40	11

   2) Calculate the value of correlation coefficient by using the following data :

   $n = 7$, $\sum x = 349$, $\sum y = 366$, $\sum x^2 = 19753$, $\sum y^2 = 21100$, $\sum xy = 20343$.
   Comment on your result.

SLR-M – 50

Seat No.	

B.Sc. – II (Semester – IV) (Biotechnology) Examination, 2015
ENVIRONMENTAL BIOTECHNOLOGY – II (Old)
Bioenergy and Bioremediation

Day and Date : Wednesday, 13-5-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the following sentences by choosing correct alternatives given below : **10**

i) The mechanism of phytostabilization is to _____
   a) accumulate to toxic substances
   b) limit the bioavailability of toxic pollutants
   c) transform the toxic pollutants
   d) vapourize the toxic pollutants

ii) _____ is the method of Ex situ bioremediation.
   a) Biofiltration b) Bioventing c) Composting d) Bioslurping

iii) Using bacteria to _____ is not an example of bioremediation.
   a) make antibiotics and vitamins
   b) break down the organic matter in sewage sludge
   c) clear up oil spills
   d) remove toxic substances from old mining sites

iv) The characterization of site is carried out for _____ in ground water bioremediation.
   a) soil type b) aquifer type
   c) water table location d) all of these

v) The addition of _____ is carried out in bioaugmentation.
   a) organisms b) nutrients c) water d) air

vi) There are many places where energy can be produced. The best place to generate energy from waves is _____
   a) a big river b) a reservoir c) the sea d) a lake

vii) Biogas are produced from _____
   a) biomass b) agricultural waste
   c) garbage d) all of these

P.T.O.

viii) The energy obtained from the earth's hot interior is called as _____ energy.
a) geothermal b) thermal c) biomass d) tidal

ix) _____ is a process that converts organic or fossil fuel based carbonaceous material into carbon monoxide, hydrogen and carbon dioxide.
a) Gasification b) Pyrolysis c) Liquefaction d) Compression

x) A system of using land to grow to provide fuel rather than food and fibre is termed as _____
a) energy agriculture b) energy crop
c) energy plantation d) none of these

2. Answer **any five** of the following : **10**
i) What is composition of biogas ?
ii) Write a note on microorganism that degrade petroleum hydrocarbon.
iii) What is the source of sun's energy ?
iv) How inoculation affects In Situ bioremediation of ground water ?
v) Explain the term global energy.
vi) Illustrate the term bioremediation.

3. A) Answer **any two** of the following : **6**
i) Discuss about energy from solid waste.
ii) Explain the forms of energy and their transformation.
iii) What is the impact of energy use on the environment ?

B) Give an account of Ex situ biotechnology method for remediation of soil. **4**

4. Answer **any two** of the following : **10**
i) Discuss the mechanism of anaerobic digestion. Add a note on energy production.
ii) Define energy. Explain sources and classification of energy.
iii) Write a note on In situ bioremediation of groundwater.

5. Answer **any two** of the following : **10**
i) What is phytoremediation ? Explain phytoremediation technology for soil decontamination.
ii) Explain biotreatment technology for landfill leachate contamination.
iii) Discuss energy use pattern in different parts of world and India.

_____

SLR-M – 51

Seat No.	

B.Sc. – II (Biotech.) (Semester – IV) Examination, 2015
BIOENERGETICS AND METABOLISM – II (Old)
(Metabolism)

Day and Date : Thursday, 14-5-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the following sentences by choosing correct alternative given below : **10**

i) Glycogen phosphorylase hydrolyses _____ glycosidic bond.

a) $\alpha - 1, 6$ b) $\alpha - 1, 4$ c) $\beta - 1, 4$ d) $\beta - 1, 6$

ii) Pentose phosphate pathway produces _____

a) ATP b) NADH c) NADPH d) All of these

iii) _____ is not present in cerebrosides.

a) Galactose b) Sulfur c) Sphingosine d) Fatty acids

iv) The enzyme required for hydrolysis of triacylglyceride is _____

a) Thiolase b) Enoyl CoA reductase
c) Lipase d) Enoyl CoA hydratase

v) Mitochondrial membrane is permeable to _____ chain fatty acids.

a) short b) medium c) long d) all of these

vi) The major site of urea synthesis is _____

a) brain b) kidney c) liver d) muscles

vii) The amino acid that undergoes oxidative deamination at a significant rate is _____

a) Alanine b) Aspartate c) Glutamine d) Glutamate

viii) Xanthosine monophosphate is an intermediate during de novo synthesis of _____

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

P.T.O.

ix) Reducing equivalents move in the electron transport chain from _____

a) Reduced substrate to oxygen b) Oxidized substrate to oxygen

c) Oxygen to reduced substrate d) Oxygen to oxidized substrate

x) The first electron acceptor in electron transport chain from NADH is _____

a) FAD b) Ubiquinone

c) Cytochrome d) FMN

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

i) Enlist the names of enzymes involved in urea cycle.

ii) State the distinguishing step of odd chain fatty acid oxidation from even chain fatty acid.

iii) What is photosynthesis ? Give its general reaction.

iv) Mention the steps of β-oxidation of even chain saturated fatty acids.

v) Define the term uncoupler. Give an example.

vi) What is glycogenic amino acid ? Give any two examples.

3. A) Answer **any two** of the following : **6**

i) Explain the regulation of cholesterol metabolism.

ii) Discuss about glycerol 3-phosphate shuttle involved in transport of reducing potential.

iii) How galactose is entered in glycolysis ?

B) Give an account of degradation of pyrimidine. **4**

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

i) Describe the general reactions of amino acid metabolism.

ii) Discuss in brief the energetics of TCA cycle.

iii) Explain chemiosmotic hypothesis of oxidative phosphorylation ? Draw a neat labelled diagram of mitochondria.

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

i) Write a note on regulation of glycolysis.

ii) Explain in brief the ATP yield from palmitic acid during β-oxidation.

iii) Discuss in detail the electron carriers in electron transport chain.

_____

SLR-M – 52

Seat No.	

B.Sc. – II (Biotechnology) (Semester – IV) Examination, 2015
IMMUNOLOGY – II
(Humoral and Cell Mediated Immunity) (Old)

Day and Date : Friday, 15-5-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

***Instructions** : 1) **All** questions are **compulsory**.*
*2) Draw figures where it is **necessary**.*
*3) Figures to the **right** side indicate **full** marks.*

1. Rewrite the following sentences by selecting the correct answer from the given alternatives : **10**

I) _____ class of immunoglobulins are produced during primary immune response.

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

II) Contact dermatitis is an example of _____ hypersensitivity.

a) Type I b) Type II
c) Type III d) Type IV

III) IgE is _____ antibody.

a) Homocytotropic b) Complement fixing
c) Pentameric d) Heat stable

IV) Warm antibodies produced in autoimmune hemocytolytic anemia are _____

a) Incomplete antibodies
b) Non agglutinating antibodies
c) Of IgG class
d) All of these

P.T.O.

V) _____, an autoimmune disease is associated with enlargement of thyroid gland.

a) Addison's b) Hashimoto's

c) Pernicious anemia d) Polyarthritis nodosa

VI) Non living transplants like bone are called _____

a) Vital grafts b) Structural grafts

c) Orthotopic graft d) Autograft

VII) BCG vaccination is done to protect against _____

a) Cholera b) Typhoid

c) Tuberculosis d) Plague

VIII) Except _____ all are antigen presenting cells.

a) Macrophages b) Dendritic cells

c) B cells d) Mast cells

IX) B blood group persons have _____ antigen on their RBCs.

a) A b) AB c) O d) B

X) HLA typing is done _____

a) To determine HLA ags on leucocytes

b) To test skin allergy

c) To diagnose HIV infection

d) To determine auto immunity

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

1) What are cytokines ? Give examples of it.

2) What is graft verses host reaction ?

3) What do you mean by subunit vaccine ?

4) What is atopy ?

5) What is an allograft ?

6) What do you mean by hapten ?

3. A) Answer the following questions (**any 2**) : **6**

   1) What is the role of B cells in immunity ?

   2) What is passive immunization ?

   3) Describe in short immunity to protozoa.

   B) Discuss different types of ABO blood groups. **4**

4. Write short notes on (**any 2**) : **10**

   1) Mechanism of autoimmunity

   2) MHC Class II molecules

   3) Killed vaccines.

5. Write short notes on (**any 2**) : **10**

   1) Immunity to viruses

   2) Rh blood group system

   3) Anamnestic reaction.

SLR-M – 55

Seat No.	

B.Sc. – III (Semester – V) Examination, 2015
BIOTECHNOLOGY
Fermentation Technology

Day and Date : Tuesday, 7-4-2015 Max. Marks : 50
Time : 3.00 p.m. to 5.00 p.m.

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**

1) Hydrolysis of starch is required in ethanol fermentation as saccharomyses cerevisiae has _____
   a) no α-amylases b) no β-amylases
   c) no glucoamylases d) all of these

2) In _____ fermentation cobalt and 5, 6-dimethylbenimidazole must be added as supplement.
   a) citric acid b) vitamin B_{12} c) ethanol d) amylase

3) Fermentation economics is based on _____
   a) medium constituent b) incubation period
   c) recovery d) all of these

4) In alcohol industry liquefaction of starch before the addition of malt saccharification carried by _____
   a) α-amylases b) protease c) lipase d) nuclease

5) Soy meal used in fermentation has _____
   a) 50% proteins and 30% carbohydrates
   b) 30% proteins and 50% carbohydrates
   c) very less proteins
   d) very high carbohydrates

6) Through the reverse osmosis _____ sized particles are separated.
   a) 0.0001 – 0.001 μm b) 0.001 – 0.1 μm
   c) 0.1 – 10 μm d) 10 – 100 μm

7) Above _____ citric acid crystallizes as anhydrous acid.
   a) 34°C b) 36.5°C c) 40°C d) 27°C

8) Head space at the top of fermentor allows liquid medium for _____
   a) splashing b) foaming c) aeration d) all of these

9) The sterilization of air in fermentation industry is widely carried out by _____
   a) Heat
   b) U.V.
   c) Filtration
   d) Electrostatic precipitation

10) Primary screening of organic acid producer carried by _____ in nutrient agar.
   a) addition of pH indicator
   b) addition of calcium carbonate
   c) both of these
   d) none of these

2. Explain **any five** of given below : **10**
   1) Agitation
   2) Transduction
   3) Precipitation
   4) Screening
   5) Scale up
   6) Vitamin.

3. A) Write the short answer of **any two** : **6**
   1) Media sterilization.
   2) Microbial assay.
   3) Applications of computer in fermentation.

   B) Write an essay on centrifugation for product recovery. **4**

4. Answer **any two** of the following : **10**
   1) Write an essay on preservation and maintenance of industrial microbes.
   2) Write an essay on penicillin fermentation.
   3) Write an essay on components of typical fermentor.

5. Answer **any two** of the following : **10**
   1) Write an essay on primary screening.
   2) Write an essay on vitamin B_{12} fermentation.
   3) Write an essay on amylase fermentation.

_____

SLR-M – 56

Seat No.	

B.Sc. – III (Biotechnology) (Semester – V) Examination, 2015
PLANT DEVELOPMENT

Day and Date : Wednesday, 8-4-2015 Max. Marks : 50
Time : 3.00 p.m. to 5.00 p.m.

N.B. *: i)* ***All*** *questions are* ***compulsory****.*
ii) ***Draw*** *neat labelled diagram* ***wherever*** *necessary.*

1. Rewrite the following sentences by choosing correct alternatives : **10**

1) The pollen tube discharges its content in _____
   a) the egg b) one of the synergids
   c) the central cell d) one of the antipodal cells

2) Pollination effected by wind is called _____
   a) ornithopily b) anemopily c) entomopily d) hydropily

3) The development of embryo from the cell of integuments is known as _____
   a) apogamy b) apospory
   c) parthenogenesis d) adventive embryo

4) _____ amino acid is the precursor of growth hormone indole acetic acid.
   a) alanine b) tryptophan c) valine d) trypsine

5) Growth hormone producing apical dominance is _____
   a) auxin b) gibberellins c) ethylene d) cytokinin

6) Hormone pair required for a callus to differentiate are _____
   a) auxin and cytokinin b) auxin andethylene
   c) auxin and abscisic acid d) cytokinin and gibberellins

7) Photoperiodism is perhaps is due to the synthesis of _____
   a) Florigen b) Auxins
   c) Cytokinin d) Gibberellins

8) Phytochrome becomes active in _____
   a) green light b) blue light
   c) red-far red light d) none of these

9) The RNA is the genetic material of TMV was discovered by _____
   a) Gierere and Schramm b) Lindemann
   c) Lwoff and Tournter d) Diener and Rayner

10) The number of camsomeres present in the capsid of TMV is _____
   a) 1230 b) 3120 c) 2300 d) 2130

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

1) Structure of 2,4-D.
2) Integuments.
3) Synergid cell.
4) Capsomere.
5) What is biodiveristy ?
6) What is apomixis ?

3. a) Attempt **any two** of the following : **6**

1) Mention causes of polyembryony.
2) Applications of auxins.
3) What is role of florigen ?

b) Give an account on loss of biodiversity. **4**

4. Attempt **any two** of the following : **10**

i) Write in brief on development of male gametophytes.
ii) Write an essay on somatic embryogenesis.
iii) Explain the chemical method of protoplast isolation.

5. Attempt **any two** of the following : **10**

1) Explain the mechanism of flower patterning.
2) Write an essay on TMV.
3) Describe the process of embryo development in monocot.

_____

SLR-M – 57

Seat No.	

B.Sc. (Part – III) (Semester – V) Examination, 2015
BIOTECHNOLOGY
Bioinformatics

Day and Date : Monday, 13-4-2015 Max. Marks : 50
Time : 3.00 p.m. to 5.00 p.m.

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

1. Rewrite the sentence using correct alternative given below. **10**

1) The PubMed provides information of _____ database.
   a) Nucleotide b) Protein
   c) Genome d) Literature

2) Sanger Centre, HGMP-RC, EBI is hosted by _____
   a) Hinxton Hall b) MIPS
   c) UCL d) NCBI

3) The protein sequence database is _____
   a) GenBank b) EMBL
   c) DDBJ d) SWISS-PROT

4) Needleman and Wunch algorithm is used for _____ alignment.
   a) Local b) Global
   c) Gapped d) Ungapped

5) In 1996, EMBnet operates total _____ nodes.
   a) 8 b) 11 c) 24 d) 34

6) The graphical interference is provided by _____
   a) Clustal W b) Clustal X c) Clustal Y d) Clustal Z

7) Gene prediction in prokaryotes is generally easier than in eukaryotes because they _____
   a) Give good response b) Lack exons
   c) Lack introns d) Contains cDNA

P.T.O.

8) FASTA algorithm was described by _____
   a) Altschul b) Lipman and Pearson
   c) Wunch d) Smith

9) _____ alignment is widely used for prediction of phylogenetic relationship.
   a) Global-pairwise b) Local-pairwise
   c) Global-multiple d) Local-multiple

10) The possible translational reading frame in every nucleic acid sequence is _____
   a) Three b) One c) Six d) Nine

2. Answer **any five** of the following : **10**
   i) What is genomics ?
   ii) Write a note on SWISS-PROT.
   iii) What is Entrez ?
   iv) What is FASTA ?
   v) What is NRL-3D ?
   vi) Write a note on BLOSUM matrices.

3. A) Answer **any two** of the following : **6**
   i) Write a note on EBI and EMBL.
   ii) What is BLAST ? Write on its different types.
   iii) Give applications of multiple sequence alignments.

   B) Write a note on genome sequencing projects. **4**

4. Answer **any two** of the following : **10**
   i) Write the applications of bioinformatics.
   ii) Write a note on primary protein sequence databases.
   iii) Write a note on genome information resources.

5. Answer **any two** of the following : **10**
   i) Explain the methods of gene prediction in Eukaryotes.
   ii) Write a short note on search engine and literature databases.
   iii) Explain the algorithm of local alignment.

_____

SLR-M – 58

Seat No.	

B.Sc. – III (Semester – VI) (Biotechnology) Examination, 2015
ENGLISH (Compulsory)
Countdown-English Skills for Success

Day and Date : Wednesday, 1-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. A) Choose the right answer from the following alternatives and rewrite the sentences : **6**

1) A lack of self esteem _____
   a) Stimulates psychological growth
   b) Impedes psychological growth
   c) Accelerates psychological growth
   d) Has no bearing on psychological growth

2) Haldanels purpose in writing this essay is
   a) To promote a scientific theory
   b) To promote a particular theory
   c) To promote objectivity in science
   d) To promote subjectivity in science

3) As a young man, Rahim Khan was
   a) Rebellions and resentful b) Strong and athletic
   c) Sly and deceitful d) Honest and faithful

4) A scientist cannot decide what is
   a) good and bad b) day and night
   c) black and white d) right and wrong

5) The refugee mother had a _____ smile in the poem, 'Refugee Mother and Child'.
   a) Sad b) Pleasant
   c) Mocking d) Ghost

6) William Wordsworth is the _____ poet.
   a) Classical b) Rustic
   c) Urban d) Nature

B) Select the correct idiom according to the meaning expressed in the statement. **2**

1) Lack of money is the main stumbling block to the company's growth.

a) an obstacle b) hindrance

c) encouragement d) difficulty

2) The two teams were neck and neck until the last game.

a) equal b) unequal

c) differently positioned d) unmatched

C) Tick the right combination of words in the following : **2**

1) Speak fluent English/Speak easy English.

2) Background knowledge/earlier knowledge.

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

1) What are the six pillars of self esteem ?

2) What is scientific point of view ?

3) What are the three results of low self esteem ?

4) What was Rahim Khan's occupation ?

5) How can human beings control their actions, according to Haldane ?

6) What is the difference between scientific and judge ?

3. A) Answer **any two** of the following : **6**

1) What is the central theme of the poem 'Daffodils' ?

2) What are the emotions of the Refugee Mother ?

3) Describe the dead child in the poem 'Refugee Mother and Child'.

B) Answer **any two** of the following : **4**

1) Leela is a newly married girl. How will she adapt herself to a new environment at in-laws house ?

2) Mr. Sharma lost his job due to his careless attitude. How will he manage the stress ?

3) Make a list of four ways in which you waste your time and say how you can manage your time better.

4. Write a description of a person you met at a musical concert. Give the details of his personality. **10**

OR

Write a description of your favourite cricketer with personality details.

5. Read the following passage and summarise it. **10**

Self esteem is the experience of being competent to cope with the basic challenges of life and being worthy of happiness. It consists of two elements.

1) Self-efficacy confidence in our ability to think, learn, choose and make appropriate decisions and

2) Self-respect confidence in our right to be happy and in the belief that achievement, success, friendship, respect, love and fulfillment are appropriate to us.

The basic challenges of life include such fundamentals as being able to learn a living and take independent care of one self in the world, being competent in human relationship, so that our interactions with others are, more often than not, mutually satisfying and having the resilience that allows one to bounce back from adversity and persevere in one's aspirations.

_____

SLR-M – 59

Seat No.	

B.Sc. – III (Semester – VI) Examination, 2015
GENETIC ENGINEERING – APPLICATIONS (Biotechnology)

Day and Date : Monday, 6-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the following sentence by using appropriate alternative. **10**

1) Golden rice is trangenic crop of the future with the following improved trait _____

a) Insect resistance
b) High protein content
c) High Vit. A content
d) High lysin content

2) A genetically engineered microorganism used successfully in bioremediation _____

a) Trichoderma b) Bacillus
c) Xanthomonas d) Pseudomonas

3) Dolly the first animal produced through cloning is _____

a) Camel b) Rat
c) Cow d) Sheep

4) Gene cloning refers to _____

a) Production of large number of copies of gene being cloned
b) Production of asexual progeny from a single individual or a cell
c) Both a) and b)
d) None of these

P.T.O.

5) Two bacteria found to be very useful in genetic engineering experiment are _____
   a) Nitrobacter and Azatobacter
   b) Rizobium and Diplococcus
   c) Nitrosomonas and kliebsiella
   d) Escherichia and Agrobactarium
6) _____ organism used for alcohol production
   a) Xanthomonas b) Zymomonas
   c) Mycobactarium d) None of these
7) Xanthum gum produced from _____
   a) Pesudomonas b) Mycobactarium
   c) Xanthomonas d) None of these
8) Transgenic mice used to treat _____
   a) Alzimer's disease b) Cholera
   c) Headache d) Both a) and b)
9) Inhibition of translation by using single stranded nucleotide called as _____
   a) Antigene therapy b) Antisense therapy
   c) Nucleic acid therapy d) Gene therapy
10) Nif genes were first isolated from the clone banks of _____
   a) E. Coli b) Pesudomonas
   c) K. pneumonia d) S. aureus

2. Answer the following (**any 5**) : **10**
   1) Antisense RNA
   2) Antisense oligonucleotide
   3) Define subunit vaccine
   4) Gene therapy for cystic fibrosis
   5) Tooth and mouth diseases
   6) Modification of food plant taste eg. sweetness.

3. A) Answer the following (**any 2**) : **6**

   1) Write a note on Transgenic mice.

   2) Write in brief plant act as bioreactor for carbohydrates.

   3) Write in brief dignosis method of malaria.

   B) Write a note on Monoclonal antibodies in treatment of brain tumor. **4**

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

   1) Write a note on microbial degradation of Xenobiots.

   2) Gene therapy for cystic fibrosis.

   3) Write note on Interfering RNA.

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

   1) With suitable examples describe genetic engineering in plants.

   2) Write a note on herbicide resistance.

   3) Synthesis of any one noval antibiotic.

SLR-M – 6

Seat No.	

B.Sc. – I (Semester – I) Biotechnology (Old) Examination, 2015
ENGLISH (Compulsory)
On Track : English Skills for Success

Day and Date : Wednesday, 1-4-2015 Max. Marks : 50

Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the following sentences by choosing **correct** alternative. **10**

i) The name of the policeman on the beat was ————
a) Bob b) Jimmy c) Henry d) Joe

ii) From what she tells the writer, it is clear that Miss Krishna's life with her mother was ————
a) miserable b) comfortable c) very happy d) difficult

iii) The word 'intelligence' is derived from the ———— word intelligence.
a) Roman b) French c) Italian d) Latin

iv) The bangle sellers carrrying their wares ————
a) to a married woman's house
b) to the streets
c) to the house of a maiden woman
d) to a temple fair

v) The speaker of the poem, 'An Irish Airman Foresees His Death' is an ———— soldier.
a) American b) English c) Irish d) Indian

vi) When the writer invited her to stay with her for a while, Miss Krishna agreed
a) reluctantly b) shyly c) readily d) sadly

vii) There is a <u>mob</u> on the road. The underlined word is ———— noun.
a) common b) mass c) proper d) collective

viii) Rohan is ———— cleverest student I have ever seen.
a) an b) the c) a d) zero article

ix) Rohini took ———— degree in commerce from Solapur University.
a) an b) a c) the d) zero article

x) Leela does all her work ———— great care.
a) on b) in c) for d) with

2. Answer following questions in **two-three** sentences : **10**

i) What has happened to 'Big Joe' Brady's restaurant ?
ii) Why did the narrator consider Miss. Krishna an annoying guest ?
iii) Why can computers not 'think' in the same way as human beings ?
iv) What was the policeman constantly doing with his stick ?
v) Describe the different types of bangles which the bangle-sellers carry.
vi) What is the speakers attitude towards those that he fights against ?

3. A) Write brief answers to the following questions **(any 2) :** **6**

i) What short of relationship did Bob and Jimmy share ?
ii) What do you understand of Miss. Krishna's childhood from the story ?
iii) What are the myths regarding the intelligence of computers ?

B) Write answers to the following questions in short **(any 2) :** **4**

i) How does the poet describe the faithful wife who is now middle-aged ?
ii) What is the Irish airman's attitude towards the war he is fighting in ?
iii) Why does the poet describe the bride's bangles as 'tinkling, luminous, tender and clear' ?

4. A) Write an essay describing an eventful cricket match which you have seen and experienced. **10**

OR

B) Write a paragraph of **five-six** sentences on each of the following :
i) Solar energy ii) An exciting holiday.

5. Read the following passage carefully and write out a brief note on it : **10**

Technological progress has proved very harmful to environment. Drinking water and air are getting more and more polluted. Polluted water is a major cause of diseases like cholera, typhoid, dysentery and other intestinal troubles. Toxic elements like mercury, cyanides, arsenic and cadmium pollute water dangerously. Smoke emanating from the industrial units pollute air with oxides of carbon, sulphur and nitrogen. This has created a big health hazard in cities like Mumbai, Delhi and Calcutta. There is high incidence of T.B chest pains and bronchial and other respiratory diseases among children in these cities.

———————

SLR-M – 60

Seat No.	

B.Sc. – III (Semester – VI) Examination, 2015
BIOTECHNOLOGY
Food and Dairy Technology

Day and Date : Tuesday, 7-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the following sentences by selecting correct answers from given alternatives : **10**

1) In cheese production _____ enzyme is added for coagulation of milk.
   a) oxidase b) reductase
   c) lipase d) renin

2) Preservation of pickles is done by _____
   a) osmotic pressure b) radiation
   c) heating d) low temperature

3) _____ is an example of food poisoning.
   a) Salmonellosis b) Botulism
   c) Typhoid d) Dysentery

4) _____ toxin is produced by A. Flavous.
   a) Endotoxin b) Exotoxin
   c) Afla d) Venoum

5) _____ is an example of perishable food.
   a) Meat b) Onion
   c) Sugar d) Potato

P.T.O.

6) _____ is a main protein present in milk.

a) Albumin b) Casein

c) Globulin d) Gelatin

7) In LTH method of pasteurization milk is heated at _____ °C for 30 minutes.

a) 71.7 b) 140

c) 68.8 d) 200

8) Microbiological quality of milk is determined by _____ test.

a) BOD b) Phosphatase

c) COD d) MBRT

9) Candler is used for detection of _____ spoilage.

a) Eggs b) Meat

c) Fruits d) Vegetables

10) Taint is a spoilage of _____

a) fruits b) vegetables

c) milk d) meat

2. Answer in short (**any five**) : **10**

a) Define food spoilage.

b) Define pasteurization.

c) What is HACCP ?

d) Define quality control.

e) What is meaning of Asepsis ?

f) Give the uses of butter.

3. A) Write **any two** of following : **6**

   a) MBRT test

   b) Quality control at source

   c) General principles of food preservation.

   B) Describe various methods of pasteurization of milk. **4**

4. Write **any two** of the following : **10**

   a) Describe rapid methods for detection of specific microorganisms in food.

   b) Describe composition and spoilage of milk.

   c) Describe the spoilage of fruits and vegetables.

5. Write **any two** of the following : **10**

   a) Describe enumeration methods for microorganisms in food.

   b) Preservation of food by low and high temperature.

   c) Describe various monitoring procedures for critical control points.

SLR-M – 61

Seat No.	

B.Sc. – III (Semester – VI) Examination, 2015
BIOTECHNOLOGY
Animal Development

Day and Date : Wednesday, 8-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite sentences using correct alternatives : **10**

1) _____ is a primitive cell which can either self renew or give rise to more specialized cell types.
   a) Macrophage b) Nerve cells
   c) Somatic cell d) Stem cell

2) A fertile animal consisting of a foreign gene in its germ line known as _____
   a) Transgenic animals b) Mutants
   c) Teratogens d) Trancogenes

3) The fluid filled space in the blastula is called _____
   a) Blastocoel b) Archenteron
   c) Free space d) Blastocoel jelly

4) _____ is required for sperm formation.
   a) Testosterone b) Estrogen
   c) Progesterone d) Prolactin

5) The uncontrolled growth of cells is called _____
   a) Cancer b) Transgenesis
   c) Stem growth d) Transduced growth

6) During oogenesis, a single primordial germ cell, produces _____ functional egg cell.
   a) 1 b) 2 c) 3 d) 4

P.T.O.

7) _____ is programmed cell death.
   a) Apoptosis b) Cancer
   c) Cell senescence d) Cell aging

8) In chick, the cleavage is _____
   a) Discoidal b) Holoblastic c) Centrolecithal d) Complete

9) The frog egg is _____
   a) Macrolecithal b) Oligolecithal
   c) Cleidoic d) Mesolecithal

10) When the transformed cells undergo metastasis, then the cancer is called _____ tumor.
   a) Malignant b) Benign c) Spreaded d) Cloned

2. Answer the following (**any 5**) : **10**
   1) Define Oogenesis.
   2) What is vitellogenesis ?
   3) Explain the term aging.
   4) What is metastasis ?
   5) Define Transgenic animals.
   6) What are stem cells ? Mention their types.

3. A) Answer the following (**any 2**) : **6**
      1) Describe the properties of stem cells.
      2) Describe the applications of cloning by giving an example.
      3) Write a note on Treatment of cancer.

   B) Write the properties of cancer cells. **4**

4. Answer the following (**any 2**) : **10**
   1) What is fertilization ? Describe the chemical factors involved in fertilization.
   2) Describe the various planes of cleavage.
   3) What is apoptosis ? Describe the pathway of apoptosis.

5. Answer the following (**any 2**) : **10**
   1) Give an account on Transgenic technology with an example.
   2) Describe the process of spermatogenesis in detail.
   3) Describe the process of formation of gastrula in chick.

_____

SLR-M – 62

Seat No.	

B.Sc. – III (Semester – VI) Examination, 2015
BIOTECHNOLOGY
Nanobiotechnology

Day and Date : Monday, 13-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the following sentences by choosing correct alternatives. **10**

1) One nanometer is equal to _____ meter.
   a) 10^{9} b) 10^{-9}
   c) 10^{7} d) 10^{-7}

2) When atoms are brought together in a fixed structure they form
   a) Alloy b) Mixture
   c) Molecule d) Biosystem

3) The Silver nanoparticles are _____ in colour.
   a) Silver b) White
   c) Golden yellow d) Red

4) The structure of nanoparticles can be predicted by _____technique.
   a) Microscopy b) Diffraction
   c) Spectroscopy d) All of the above

5) The melting temperature of metal namoparticals _____ with partical size.
   a) Increases b) Remains Constant
   c) Decreases d) Partially increases

P.T.O.

6) Germ free clothes can be made by using _____ nanoparticles.

a) Silver b) Copper

c) Gold d) Zinc

7) A device giving a signal for the detection or measurement of a Physical property to which it responds is called as

a) Motor b) Polymer

c) Sensor d) Drug

8) Tiny gold nanostructures are called as

a) Gold ions b) Quantum dots

c) Zeolites d) All of the above

9) _____ is the hardest nanostructure made of carbon.

a) Diamond b) Coal

c) Bucky ball d) Carbon nanotubes

10) _____ also can be used for nanoparticle synthesis.

a) Microorganisms b) Plants

c) Both a and c d) None of the above

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

1) What are nanoparticles ? Explain.

2) Describe the electrical conductivity of nanoparticles.

3) Explain the method of melt mix for nanoparticle synthesis.

4) Give the applications of zeolites.

5) What are aerogels ? Explain.

3. A) Answer **any two** of the following : **6**

   1) Explain the importance of nanotechnology.

   2) Write the various analytical techniques used in nanobiotechnology.

   3) What as electronic noses ? Give their applications.

   B) Explain how size matters in the nanoworld. **4**

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

   1) Comment on the various properties of nanomaterials.

   2) Differentiate between nanoscale Lithography and Ebeam Lithography.

   3) Write down the various applications of nanotechnology.

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

   1) Give the importance of Quantum theory in building fundamentals of nanotechnology.

   2) Discuss UV-VIS-NIR spectrophotometer for the study of nanoparticles.

   3) Describe Raman spectroscopy for study of nanoparticles.

SLR-M – 7

Seat No.	

B.Sc. (Part – I) (Semester – I) (Old) Examination, 2015
BIOTECHNOLOGY
Ecology and Microbiology
Paper – I : Ecology

Day and Date : Monday, 6-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. Rewrite the following sentences by choosing correct alternatives given below : **10**

1) _____ is the layer of the atmosphere which protects the Earth from the harmful Ultra Violet radiations.
   a) Troposphere b) Mesosphere c) Stratosphere d) Hydrosphere

2) A non-native species that is artificially introduced to an area is known as _____ species.
   a) endemic b) keystone c) extinct d) exotic

3) Resources that lack the ability for recycling and replacement are called _____ resources.
   a) Renewable b) Non-renewable
   c) Non-conventional d) Inexhaustible

4) The energy flow in an ecosystem is
   a) Multidirectional b) Reversible
   c) Unidirectional d) Irreversible

5) The pyramid of biomass in the forest ecosystem is
   a) Inverted b) Upright c) Irregular d) Stepped

6) _____ is an example of in-situ conservation.
   a) National Park b) Botanical garden
   c) Zoo d) Gene bank

P.T.O.

7) Silent valley is in _____
   a) Tamil Nadu b) Karnataka c) Kerala d) Assam

8) _____ is a gaseous cycle.
   a) Phosphorus b) Sulphur c) Water d) Nitrogen

9) _____ is a group of individuals living in the same area.
   a) Community b) Population c) Opportunist d) None of the above

10) _____ is the solid component of the Earth.
   a) Biosphere b) Lithosphere c) Hydrosphere d) Atmosphere

2. Answer **any five** of the following : **10**
   i) What is Food Web ?
   ii) Give the gaseous composition of Atmosphere.
   iii) Enlist the causes of deforestation.
   iv) Give a brief account on productivity of ecosystem.
   v) Explain the importance of Biodiversity.
   vi) Explain Energy Pyramid.

3. A) Answer **any two** of the following : **6**
   i) Write down types of ecological succession.
   ii) Explain Wildlife Sanctuary.
   iii) Explain biodiversity hot spots.

   B) With the help of neat labeled diagram explain Nitrogen Cycle. **4**

4. Answer **any two** of the following : **10**
   i) Explain Mineral Resources.
   ii) Explain in detail the threat to biodiversity.
   iii) Give an account on Narmada bachao Andolan.

5. Answer **any two** of the following : **10**
   i) Explain structure and function of Atmosphere.
   ii) Explain the conservation methods of biodiversity and add a note on Project Tiger.
   iii) Write in detail about Forest Ecosystem.

_____

SLR-M – 8

Seat No.	

B.Sc. (Part – I) (Semester – I) (Old) Examination, 2015
BIOTECHNOLOGY
Ecology and Microbiology
Paper – II : Microbiology

Day and Date : Tuesday, 7-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

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

1. A) Rewrite the following sentences by choosing the correct alternative given below : **10**

1) Germ theory of disease is proposed by _____
   a) Louis Pasture b) Robet Koch
   c) Joseph Lister d) Antony Van Leeuwenhock

2) _____ is major component present in Gram positive bacterial cell wall.
   a) Phospholipids b) Lipopolysaccharide
   c) Peptidoglycan d) None of these

3) Spore is _____ stage of the cell.
   a) Dormant b) Active c) Vegetative d) Growing

4) Fungi are _____ type of microorganism.
   a) Eukaryotic b) Neither Eukaryotic nor Prokaryotic
   c) Prokaryotic d) None of these

5) Penicillin act on _____ of bacterial cell.
   a) Cell membrane b) Cell wall
   c) Bacterial DNA d) Ribosome

6) _____ is example of algae.
   a) Escherichia coli b) Aspergillus
   c) Nostoc d) Candida

7) _____ is example of air borne disease.
   a) Typhoid b) Dysentery c) AIDS d) Influenza

P.T.O.

8) _____ is used for locomotion in bacteria.
   a) Capsule b) Spores c) Flagella d) None of these

9) Unit used in bacteriology for size measurement is _____
   a) Millimeter b) Centimeter c) Micrometer d) Meter

10) S. J. Singer and G. N. Nicholson proposed _____ model for structure of cell membrane.
   a) Zig-zag b) Fluid Mosaic
   c) Daniel and Davson d) None of these

2. Answer **any five** of the following : **10**
   1) Give four examples of bacteria.
   2) Define sewage microbiology and give methods used for sewage treatment.
   3) Give any four characteristics of Mycoplasma.
   4) Give applications of medical microbiology.
   5) Give any four contributions of Antony Van Leeuwenhock in microbiology.
   6) Give difference between capsule and slime layer in bacteria.

3. A) Answer **any two** of the following : **6**
      1) Write in detail the characteristics of Fungi.
      2) Describe in detail the structure and function of Flagella in bacteria.
      3) Explain Koch's Postulates.
   B) Write an essay on structure and function of Gram Positive bacterial cell wall. **4**

4. Answer **any two** of the following : **10**
   1) Explain in detail difference between prokaryotic and Eukaryotic cell.
   2) Explain classification of viruses.
   3) Write an account on types of microorganisms.

5. Answer **any two** of the following : **10**
   1) Explain general characteristics, classification of algae.
   2) Explain size and arrangement of bacteria.
   3) Explain formation and germination spore in bacteria.

_____

SLR-M – 9

Seat No.	

B.Sc. – I (Semester – I) Examination, 2015
BIOTECHNOLOGY
Introduction to Biosciences (Paper – I) (Old)
Plant Science

Day and Date : Wednesday, 8-4-2015 Max. Marks : 50
Time : 11.00 a.m. to 1.00 p.m.

Instructions *: i)* ***All*** *questions are* ***compulsory****.*
ii) Draw neat diagram ***wherever*** *necessary.*
iii) Figures to the ***right*** *indicate* ***full*** *marks.*

1. Choose the correct answer from given alternatives : **10**

1) Embryo formation by unfertilized egg is known as _____

a) Parthenogenesis b) Diplospory

c) Apospory d) Parthenocarpy

2) Filiform apparatus is associated with _____

a) Antipodals b) Synergids

c) Egg d) Embryo cell

3) _____ is the largest cell of the embryo sac.

a) Synergids b) Antipodal

c) Central cell d) Egg

4) In male gametophyte _____ eventually forms the pollen tube.

a) Generative cell b) Vegetative cell

c) Egg cell d) Sperm cell

5) When pollination is carried out by beetles, It is called as _____

a) Anemophily b) Entomophily

c) Cantharophily d) Ornithophily

P.T.O.

6) Closed vascular bundles lack _____

a) Ground tissue b) Conjuctive tissue

c) Cambium d) Pith

7) The cork, cork cambium and secondary cortex is collectively called as _____

a) Phellem b) Phellogen

c) Phelloderm d) Periderm

8) A taxon is _____

a) A group of related families

b) A group of related species

c) A type of living organisms

d) A taxonomic group of any rank

9) The hormone responsible for apical dominance.

a) IAA b) GA

c) ABA d) Florigen

10) The pigment sensitive for red and far red light is _____

a) Chlorophyll b) Phytochrome

c) Cytochrome d) Carotene

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

1) Enlist principles of ICBN.

2) Give types of pollination with suitable examples.

3) What is fruit ? Enlist types of fruits.

4) Draw a labeled diagram of mature embryo sac.

5) Describe in brief practical applications of auxins.

6) Define secondary growth.

3. A) Answer **any two** of the following : **6**

   1) What is Binomial nomenclature ? Give its significance.

   2) What is dormancy of seed ? Give methods of breaking of seed dormancy.

   3) Describe periderm formation.

   B) Give economic importance of gymnosperms. **4**

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

   1) Give outline of Bentham and Hooker's system of classification.

   2) Give salient features of fungi.

   3) What is tissue ? Describe simple tissue with suitable example.

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

   1) What is secondary growth ? Describe intrastellar normal secondary growth in brief.

   2) What is growth ? Give an account on phases of growth.

   3) Describe development of male gametophyte with the help of diagram.