SLR-X – 1

Seat No.	

B.Sc. – I (Semester – I) (Biotechnology) (CGPA) Examination, 2016
ENGLISH COMPULSORY

Day and Date : Tuesday, 22-3-2016 Max. Marks : 70
Time : 10.30 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 the correct alternative : **14**

1) The name of the policeman on the beat was _____
   a) Jimmy Wells b) Jimmy Porter
   c) Jimmy Wel d) Jimmy Pals

2) Twenty years ago, Jimmy and Bob dined at _____
   a) Big John Brady's Restaurant
   b) Big Boss Restaurant
   c) Big Joe Brady's Restaurant
   d) Big John Brandy's Restaurant

3) The writer and Miss Krishna _____
   a) Were at school together
   b) Met at an exhibition
   c) Met at a tea party
   d) Were neighbours

4) 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

5) According to Binet, a psychologist who developed the _____ test.
   a) G. K. b) I. Q.
   c) S. T. S. d) S. T. I.

6) The word 'intelligence' is derived from the Latin word _____
   a) intellegere b) intellect
   c) intellectual d) none of the above

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) Where are the bangle sellers carrying their wares ?
   a) To a married woman's house
   b) To the house of a maiden woman
   c) To a temple fair
   d) To the streets

9) An Irish Airman Foresees His Death is written by _____
   a) W. B. Yeats b) W. B. Keats
   c) John Henry d) Sarojini Naidu

10) The Speaker in the poem 'An Irish Airman Foresees His Death' belongs to _____
   a) Switzerland b) Ireland
   c) Newzealand d) England

11) Salma is a _____ noun.
   a) Proper b) Common
   c) Collective d) None of the above

12) <u>They</u> are happy to see <u>her</u> dancing. The underlined word is _____
   a) Nouns b) Pronouns
   c) Prepositions d) Conjunctions

13) Prema is fond _____ dancing.
   a) of b) to
   c) on d) by

14) Anu is _____ Sania Mirza of our college.
   a) a b) the
   c) an d) no article

2. Answer **any seven** of the following questions in **two** or **three** sentences **each** : **14**
   1) What sort of relationship did Bob and Jimmy Share ?
   2) Why does Jimmy send another policeman to arrest Bob ?
   3) What is the meaning of the title 'Connoisseur' ?
   4) Why did the narrator consider Miss Krishna an annoying guest ?
   5) What are the many facets of intelligence ?
   6) What are the merits of artificial intelligence ?
   7) Which are the preferred colours for the bangles of a newly married woman ?
   8) Who is the Speaker in the poem 'An Irish Airman Foresees His Death' ?

3. A) Write short paragraphs on **any two** of the following : **8**
      1) My family.
      2) Solar energy.
      3) My favourite book.

   B) Answer **any three** of the following questions briefly : **6**
      1) What is the central idea of the poem 'Bangle Sellers' ?
      2) What is the Irish airman's attitude towards the war he is fighting in ?
      3) What are the myths regarding the intelligence of computers ?
      4) What do you understand of Miss Krishna's childhood from the story ?

4. Write an essay on **any one** of the following topics. **14**
   1) The role of women in the modern society.
   2) The benefits and drawbacks of mobile phones on the lives of young people in the present day.

5. Read the following passage carefully and make a note of it. **14**

   Everyone knows that taxation is necessary in a modern state : without it, it would not be possible to pay the soldiers and policemen who protect us ; nor the workers in government offices who look after our health, our food, our water and all other things that we cannot do for ourselves; nor also the ministers and members of parliament who govern the country for us. By means of taxation, we pay for things that we need just as much as we need somewhere to live and something to eat.

But though everyone knows that taxation is necessary, different people have different ideas about how taxation should be assigned. Should each person have to pay a certain amount of money to the government each year ? Or should there be a tax on things that people buy and sell ? If the first kind of taxation is used, should everyone pay the same tax, whether he is rich or poor ? If the second kind of tax is preferred, should everything be taxed equally ?

In most countries, a direct tax on persons, which is called income tax, exists. It is arranged in such a way that the poorest people pay nothing and the percentage of tax grows greater as the tax-payer's income grows. In England, for example, the tax on the richest people goes up as high as ninety-five percent !

But countries with direct taxation nearly always have indirect taxation too. Many things imported into the country have to pay taxes and duties. Of course, it is the men and women who buy these imported things in the shops who really have to pay the duties, in the form of higher prices. In some countries, 400, there is a tax on things sold in the shops. If the most necessary things are taxed, a lot of money is collected, but the poor people suffer most. If unnecessary things like jewels and fur coats are taxed, less money is obtained, but the tax is fairer, as the rich pay it. Probably this last kind of indirect tax, together with a direct tax on incomes which is low for the poor and high for the rich, is the best arrangement.

SLR-X – 2

Seat No.	

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

Day and Date : Wednesday, 23-3-2016 Max. Marks : 70
Time : 10.30 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 labelled diagram* ***wherever*** *necessary.*

PAPER – I
(Ecology)

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

1) The living organism derive their energy and nutrient from _____
   a) Sun b) Green plants
   c) Lithosphere d) Abiotic factors

2) _____ of the following is significant in maintaining heat budget of earth.
   a) Nitrogen and oxygen b) Ozone and helium
   c) Water vapour d) Water vapour and CO_2

3) Most of cloud and weather system occurred in _____
   a) Troposphere b) Mesosphere
   c) Stratosphere d) Exosphere

4) Which of the following is logical sequence ?
   a) Producer $\rightarrow$ Consumer $\rightarrow$ Decomposer
   b) Consumer $\rightarrow$ Decomposer $\rightarrow$ Consumer
   c) Producer $\rightarrow$ Consumer $\rightarrow$ Producer
   d) Decomposer $\rightarrow$ Consumer $\rightarrow$ Producer

5) All same species in a given physical area are termed as _____
   a) Population and diversity b) Community
   c) Population d) Productivity

2. Answer **any five** of the following **10**
   1) Explain number pyramid.
   2) Give any four causes of deforestration.
   3) What are endangered species ?
   4) Explain food chain.
   5) Write down composition of atmosphere.
   6) Explain Red data book.
   7) Draw hydrological cycle.

3. A) Write short notes on **any two** of the following : **10**
   1) Explain Hot Spot of Indian Biodiversity.
   2) What is natural resources ? Explain forest as an natural resource.
   3) Draw and explain internal structure of earth.

   B) Answer **any one** of the following : **10**
   1) Write down in details threats to biodiversity and explain in situ and ex-situ conservation of wildlife.
   2) Define ecosystem. Give an account of structure and function of ecosystem.

PAPER – II
(Microbiology)

1. Rewrite the following sentences by choosing correct alternatives given below : **5**
   1) Many flagella dispersed randomly over the surface of bacterial cell is called _____ flagellar arrangement.
      a) Monotrichous
      b) Peritrichous
      c) Amphitrichous
      d) Lophotrichous
   2) Chemically volutin granule is _____
      a) Nitrogen b) Lipoprotein
      c) Polyphosphate d) Protein
   3) _____ is invasion of bacterial cell membrane.
      a) Lysosomes b) Mesosomes
      c) Granule d) None of these

4) _____ is major component present in gram positive bacterial cell wall.
   a) Mg-ribonucleate b) Mg-Gluconate
   c) Peptidoglycan d) Mg-ribose

5) The type of ribosomes present in prokaryotic cell is _____
   a) 25s b) 80s
   c) 100s d) 70s

2. Answer **any five** of the following **10**
   1) Give general characteristics of Actinomycetes.
   2) Give any four examples of air borne diseases.
   3) Define capsule and slime layer.
   4) Give any four characteristics of viruses.
   5) Define reserve food materials and its function in bacteria.
   6) Give any two names of bacteria.
   7) Types of microorganism.

3. A) Write short notes on **any two** of the following : **10**
   1) Give structure and function of peptidoglycan in bacteria.
   2) Explain germ theory of disease.
   3) Give general characteristics of Archaebacteria.

   B) Answer **any one** of the following : **10**
   1) Write an account on applied branches in microbiology.
   2) Write an account on general characteristics, classification and cultivation of fungi.

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SLR-X – 3

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) (CGPA) Examination, 2016
INTRODUCTION TO BIOSCIENCES

Day and Date : Saturday, 26-3-2016 Total. Marks : 70
Time : 10.30 a.m. to 1.00 p.m.

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

PAPER – I

Plant Science

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

1) Pineapple is example of _____ fruit.
a) simple dry b) simple fleshy c) aggregate d) composite

2) Organic acid like Oxalic acid obtained from _____
a) Aspergillus niger b) Ganoderma lucidum
c) Agaricus compestris d) Ashhya gossypi

3) In vernalization the cold stimulus is perceived by _____
a) Axillary bud b) Floral bud c) Apical bud d) Leaves

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

5) In normal extra stellar secondary growth the cork-cells are also called as
a) Phellum b) Phellogen c) Phelloderm d) None of the above

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

i) Write any five general characters of lichens.

ii) Describe annual rings.

P.T.O.

iii) Describe schizocarpic fruits.

iv) Adehesion in androecium.

v) What are simple and complex tissue ? Enlist.

vi) What are annual rings ?

vii) Factors affecting viability of seed.

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

i) Explain dormancy and its type.

ii) Describe primary structure of monocot stem.

iii) Give general classification of plant kingdom.

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

i) Give an outline of Bentham and Hookers system of classification.

ii) Explain primary structure of Monocot stem with suitable diagram.

PAPER – II

Animal Science

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

1) _____ is the relationship in which the host does not react to the parasite and parasite get a suitable environment for the development.

a) Compatible relationship b) Incompatible relationship

c) Partial compatible d) None of these

2) Which of the following types of silkworms is/are found in India ?

a) Mulberry silkworm b) Eri silk worm

c) Tasar silk worm d) All of these

3) Amphibians are _____ animals.

a) Mixed blooded b) Warm blooded

c) Cold blooded d) None of these

4) In Phylum mollusca the word molluscus meaning _____

a) Soft bodied b) Hard bodied

c) In between soft and hard bodied d) None of these

5) _____ class of animals can live on land as well as water.

a) Reptilia b) Amphibia c) Aves d) Mammalia

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

1) Fresh water Aquaculture.

2) Host specificity.

3) Write any four characters of Phylum Porifera.

4) What is vermicompost ?

5) Write the beneficial effect of insects to agriculture.

6) Write the salient features of phylum Arthropoda.

7) Write any four general characters of Chordata.

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

1) Short note on Apiculture.

2) Write the general characters of class Mammalia with example.

3) Short note on i) Urochordata

ii) Cephalochordata.

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

1) Describe the classification of Non chordates with example in brief.

2) Give note on Protozoan parasite with example.

_____

SLR-X – 4

Seat No.	

B.Sc. – I (Semester – I) (CGPA Pattern) Examination, 2016
BIOTECHNOLOGY
Fundamentals of Chemistry and Bio-Physics

Day and Date : Monday, 28-3-2016 Max. Marks : 70

Time : 10.30 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 log tables/calculator is* ***allowed****.*

Paper – I **35**

(Chemical Science)

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

1) The half life period of a zero-order reaction is given by

a) $[A]_0/K$ b) $20303\ K/[A]_0$

c) $[A]_0/2K$ d) $2[A]_0/K$

2) The S.I. unit of molar conductivity is

a) $S\ cm^2\ mol^{-1}$ b) $S\ dm^3\ mol^{-1}$

c) $S\ m^2$ d) $S\ m^2\ mol^{-1}$

3) Colligative property is _____ proportional to the molecular mass.

a) Inversely b) Directly

c) Non d) Indirectly

4) Ethylene molecule has _____ hybridisation of carbon.

a) sp^3 b) sp^2 c) sp d) sp^3d

5) For the process $H_2O\ (l) = H_2O(g)$ at 100° C, ΔS is

a) Positive b) Negative

c) Zero d) Unpredictable

P.T.O.

2. Attempt **any five** of the following : **10**
   1) What is biological importance of Na and Mg ?
   2) State the first law of thermodynamics.
   3) Explain sign conversions of work.
   4) Draw neat labelled diagram of calomel electrode.
   5) Give any four properties of covalent compounds.
   6) Define conductance and molar conductance.

3. A) Attempt **any two** of the following : **20**
   1) State postulates of Valency Bond Theory (VBT).
   2) Derive the equation pH + pOH = 14.
   3) What are acidic buffers ? Explain mechanism of its action.

   B) Attempt **any one** of the following :
   1) Derive an expression for Nerst equation, calculate the potential of the cell, Zn/Zn^{2+} (0.6 M)//H^{+}(1.2 M) H_2 (g 1 atm)/Pt and E^0 for Zn = – 0.763 V.
   2) Distinguish between ionic and covalent compounds, explain sp^3 hybridization of carbon with suitable example.

Paper – II **35**

(Biophysics)

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

   i) For propagation of _____ material medium is required.
   a) Light waves b) X-rays
   c) Mechanical waves d) Electromagnetic waves

   ii) Unit of coefficient of viscosity is
   a) Poise b) Hertz c) Newton d) Erg

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

   iv) The phenomenon of bending of light waves at an edge of obstacle is called
   a) Reflection b) Refraction c) Polarisation d) Diffraction

   v) If V is the velocity of a liquid through a pipe of cross sectional area A then the relation between them is
   a) $V \alpha A$ b) $V \alpha \frac{1}{A}$ c) $V \alpha A^2$ d) $V \alpha \frac{1}{A^2}$

5. Answer **any five** of the following : **10**
   1) State Hooke's law.
   2) What do you mean by streamline flow and turbulent flow ?
   3) State any two laws of reflection of light.
   4) Define tensile strain and tensile stress.
   5) Define :
      a) Surface tension b) Angle of contact
   6) What is the effect of pressure on viscosity ?
   7) What do you mean by population inversion ?

6. A) Attempt **any two** of the following : **10**
      1) Write a note on Nicol prism.
      2) Define Young's modulus, Bulk modulus and modulus of rigidity and state the relation between them.
      3) Explain the working of Pitot tube.

   B) Attempt **any one** of the following : **10**
      1) How beats are formed ? Obtain an expression for frequency of beats.
      2) Describe Jaeger's method for the measurement of surface tension.

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SLR-X – 5

Seat No.	

B.Sc. – I (Biotechnology) (Semester – I) (CGPA) Examination, 2016
CELL BIOLOGY AND BIOSTATISTICS

Day and Date : Tuesday, 29-3-2016 Max. Marks : 70
Time : 10.30 a.m. to 1.00 p.m.

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

PAPER – I

(Cell Biology)

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

1) Suicide bags of the cell are _____

a) Mitochondria b) Lysosome
c) Chloroplast d) Golgi complex

2) _____ is known as programmed cell death.

a) Necrosis b) Cell quit
c) Cell termination d) Apoptosis

3) _____ is not a property of cancerous cell.

a) Metastasis b) Angiogenesis
c) Autocrine signaling d) Contact inhibition

4) _____ is not a termination codon.

a) UAA b) UGA c) UAG d) AUG

5) Microtubules are polymer of _____

a) Tubulin dimer b) Globular actin
c) Keratin d) None of these

P.T.O.

2. Answer the following **(any 5)** : **10**
   i) What are gap junctions ?
   ii) Give significance of mitosis.
   iii) What are PPLOs ?
   iv) What is Autocrine signaling ?
   v) What are intermediate filaments ?
   vi) Distinguish between euchromatin and heterochromatin.

3. A) Write short notes on **any two** of the following : **10**
      i) Describe structure and function of typical eukaryotic chromosome.
      ii) Describe ultra structure of prokaryotic cell.
      iii) Explain fluid mosaic and unit membrane model of plasma membrane.

   B) Answer **any one** of the following : **10**
      i) Describe process of meiosis and add a note on its significance.
      ii) Describe components and mechanism of protein synthesis.

PAPER – II

(Biostatistics)

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

   1) Secondary data do not include sources like
      a) Office records b) Bulletins
      c) Reports d) Direct Interviews

   2) If the sum of 'n' observations is 540 and their mean is 36, then the value of n is
      a) 19440 b) 54 c) 15 d) 36

   3) Let $x_1, x_2, ..., x_n$ be the set of observations, L = Largest and S = Smallest value in the data then the formula for coefficient of range is
      a) (L + S)/(L – S) b) (L – S)/L
      c) (L – S)/(L + S) d) L/S

   4) Classical probability is measured in terms of _____
      a) An absolute value b) A ratio
      c) Absolute value and ratio both d) None of the above

   5) If A and B are two events, the probability of occurrence of either A or B is given as
      a) P (A) + P (B) b) P (A $\cup$ B) c) P (A $\cap$ B) d) P (A) · P (B)

2. Attempt **any five** of the following : **10**
   1) Define 'Discrete Variable' and give an example.
   2) State merits of 'Mean'.
   3) The marks obtained in Biology by 10 students are 67, 69, 66, 68, 72, 63, 76, 65, 70, 74. Calculate the mean marks.
   4) Compute the coefficient of range for data 43, 56, 78, 14, 59, 99, 101, 106, 55.
   5) Find the correlation coefficient (r), if $b_{yx} = 0.4$, $b_{xy} = 0.9$.
   6) What is the probability of getting an even number in single throw with die ?
   7) If P(A) = 0.4, P (B) = 0.3 and P (A $\cap$ B) = 0.2, find $P\left(\frac{B}{A}\right)$.

3. A) Attempt **any two** of the following : **10**
   1) Population of fishes in 100 ponds are as follows :

No. of fishes	0 – 100	100 – 200	200 – 300	300 – 400	400 – 500	500 – 600
No. of ponds	12	18	27	20	17	6

   Draw a histogram.

   2) Calculate an arithmetic mean for daily wages from the following data :

Wages	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
No. of workers	5	10	30	20	15	10

   3) Write applications of Biostatistics.

   B) Attempt **any one** of the following : **10**
   1) Find the coefficient of correlation from the following data :

X	64	65	66	67	68	69	70
Y	66	67	68	69	70	71	72

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

X	65	63	67	64	68	62	70	66	68	67
Y	68	66	68	65	69	66	68	65	71	67

SLR-X – 6

Seat No.	

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

Day and Date : Thursday, 31-3-2016 Max. Marks : 70
Time : 10.30 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 given below **each** : **14**

1) The Parliament of Religions was to be held in _____
   a) America b) Singapore
   c) Canada d) South Africa

2) _____ is not passed by Swami Vivekananda travelling to America.
   a) Ceylon b) Singapore
   c) Penang d) Australia

3) Jain was represented by _____
   a) Vivekananda b) Chakravarthi
   c) Gandhi d) Annie Besant

4) 'The world's most dangerous animal.' Inside the cage there is no animal but a _____
   a) Nothing b) Man c) Mirror d) None

5) The main reason of the serious economics problems of the majority is _____
   a) Famine b) Negligence
   c) Ignorance d) All

6) Wernher Von Braun was _____ scientist who produced Jupiter missile.
   a) an American b) a Russian
   c) a Roman d) a German

P.T.O.

7) Brahma is a _____ Deity.
   a) Hindu b) German c) American d) Japanese

8) The poem 'Full Moon' is written by _____
   a) Kamala Das b) Robert Hayden
   c) Nani Palkhivala d) Toru Dutta

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

10) Keats takes apostrophe _____
   a) Keats' b) Keat's c) Keats's d) All

11) She took _____ laptop. (belong to Gita)
   a) Gitas' b) Gita's c) Both d) None

12) Pune is _____ to my village than Nagpur.
   a) big b) bigger c) biggest d) all

13) Die and dye are the examples of _____
   a) Homonyms b) Homophones
   c) Homographs d) Synonym

14) _____ is the antonym of literate.
   a) Illiterate b) Semiliterate
   c) Aliterate d) Hyperliterate

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

1) What is Dr. Kalam's opinion of Wernher von Braun ?
2) What had Dr. Kalam tested successfully in France ?
3) When did Swami Vivekananda Left Bombay for ?
4) What is human rights summed up ?
5) What are the primary ideas of human rights ?

6) Who were the Indians to represent various religions ?

7) Who wrote 'Brahma' ?

8) Which poem refers the garden of Gethsemane ?

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

1) What do you learn of Dr. Kalam's dedication to team work through the essay "work brings solace" ?

2) What is the history of human rights in the world ?

3) Describe the appearance of Swami Vivekananda.

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

1) What is an agenda ?

2) What is CC ?

3) What should be avoided in C.V. ?

4. Write a suitable C.V. for the post of secondary school teacher. **14**

OR

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

5. Write an e-mail application letter for an accountant. **14**

SLR-X – 7

Seat No.	

B.Sc. I (Semester – II) (CGPA) Examination, 2016
BIOTECHNOLOGY
Environmental Pollution and Microbial Techniques

Day and Date : Friday, 1-4-2016 Max. Marks : 70
Time : 10.30 a.m. to 1.00 p.m.

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

Paper – I

(Environmental Pollution)

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

i) _____ is responsible for turbidity in water.
   a) Suspended solids b) Ca and Mg
   c) NH_3 d) Phenol

ii) _____ is a important constituent of photochemical smog.
   a) N_2O_5 b) N_2O_3
   c) PAN d) CO

iii) _____ is most penetrating radiation.
   a) Alpha particles b) Beta particles
   c) Gamma rays d) Radio waves

iv) _____ metal is associated with Minamata disease.
   a) Hg b) Cd
   c) Cr d) Pb

v) _____ is generated during anaerobic digestion.
   a) Hexane b) SO_2
   c) O_3 d) CH_4

P.T.O.

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

i) Mention air pollutants responsible for Acid Rain.

ii) Name any four water borne diseases and its causative organism.

iii) What is soil salinity ?

iv) Enlist any four uses of radioactive isotopes.

v) What is energy plantation ?

vi) Give sources of Nuclear Pollution.

vii) Explain effects of Global Warming.

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

i) What is catalytic converter ? State its role in prevention of vehicular pollution.

ii) Explain conventional energy sources.

iii) What is Thermal pollution ? State its effects.

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

i) Explain the sources and types of water pollution and add a note on effects of water pollution.

ii) Explain biomass energy and give in detail the process of biogas generation and bioethanol production.

Paper – II

(Microbial Techniques)

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

i) _____ method is used for acid fast staining.

a) Manvel's b) Alberts

c) Gram's d) Zeihl-Neelsen

ii) _____ component used as solidifying agent in media preparation.

a) Sodium chloride b) Agar - agar

c) Peptone d) None of these

iii) Soil culture is mainly used for maintenance of _____

a) bacteria b) fungus

c) virus d) algae

iv) Growth in cell population in which all cell divide at the same time known as _____ growth.

a) Diauxic b) Simple

c) Synchronous d) Periodic

v) Neutral red indicator is used in _____ medium.

a) Nutrient agar b) Mac Conkey's agar

c) Saburaud's agar d) None of these

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

i) Define growth give different phases of growth.

ii) Give different methods of preservation of pure culture of microorganisms.

iii) Define disinfection and give examples of disinfectants.

iv) Give examples of living media used for cultivation of microorganisms.

v) Give principle used in hot air oven and autoclave

vi) Give examples of indicators used in different media.

vii) Define autotrophs and heterotrophs.

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

i) Chemical agents used for sterilization.

ii) Streak plate technique.

iii) Mechanism of negative staining.

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

i) Explain classification of bacteria on the basis of nutritional requirements (carbon and energy source)

ii) Explain different laboratory methods used for determination of bacterial growth.

_____

SLR-X – 8

Seat No.	

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

Day and Date : Saturday, 2-4-2016 Max. Marks : 70
Time : 10.30 a.m. to 1.00 p.m.

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

PAPER – I

(**Biochemistry**)

1. Multiple choice questions : **5**

1) _____ saccharides are the simplest sugars which cannot be further hydrolysed.
a) Mono b) Di c) Oligo d) Poly

2) Osteomalacia in adults is due to the deficiency of
a) Vitamin K b) Vitamin D
c) Vitamin C d) Vitamin E

3) α helix and β pleated sheet are observed in _____ structure of protein.
a) Primary b) Secondary
c) Tertiary d) Quaternary

4) _____ are the compounds emitted by trees to combat abiotic stress.
a) Prostaglandins b) Sphingolipids
c) Isoprenes d) Hydrocarbons

5) According to Chargaff's rule DNA from any cell should have _____ ratio of purine and pyrimidine bases.
a) 2 : 1 b) 4 : 1 c) 3 : 1 d) 1 : 1

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

i) What is mutarotation ?

ii) Which are the disorders due to the deficiency of Vitamin B1 and Vitamin K ?

iii) Which are the derivatives of monosaccharides ?

iv) What is the biological role of prostaglandins ?

v) Write about the types of DNA.

vi) Write about the tertiary structure of protein.

vii) Write the classification of amino acids.

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

i) Isoprenic chain quinones.

ii) Watson and Crick model of DNA.

iii) Fat soluble vitamins.

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

i) Give a detail account on monosaccharides with respect to structure, properties and derivatives.

ii) Describe the types and structures of lipids. Add a note on ecosanoid compounds.

PAPER – II

(Cell Physiology)

1. Multiple choice questions : **5**

1) Chlorosis is caused due to the deficiency of

a) Calcium b) Boron

c) Iron d) Copper

2) In photosynthesis _____ is act as electron acceptor.

a) $NADP^+$ b) NADPH

c) Oxygen d) None of these

3) Conversion of complex, insoluble and non-absorbable molecules in simple soluble and absorbable molecules is called as

a) Respiration b) Excretion

c) Circulation d) Digestion

4) _____ is fluid connective tissue.
   a) Urine b) Blood c) Bile juice d) Pancreatic juice

5) _____ is also called as vasopressin.
   a) TSH b) ADH c) LH d) FSH

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

1) Define transpiration.
2) What is meant by photoperiodism ?
3) Hormones of gastro-intestinal tract.
4) Draw a neat labelled diagram of neuron.
5) Enlist types and functions of phytohormones.
6) Enlist different types of joints in human body.
7) Hormonal regulation of kidney functions.

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

1) Describe human excretory system.
2) Write a note on essential mineral elements.
3) Describe in detail double circulation.

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

1) Explain C4 pathway of CO_2 fixation in plants.
2) Describe human neural system.

_____

SLR-X – 9

Seat No.	

B.Sc. – I (CGPA Pattern) (Semester – II) Examination, 2016
BIOTECHNOLOGY
Biometry and Tissue Culture

Day and Date : Monday, 4-4-2016 Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

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

2) Draw ***neat*** *labelled diagram* ***wherever*** *necessary.*

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

PAPER – I

(Biometry)

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

1) If A = {7, 8, 6} and B = {6, 9} then A – B = _____

a) {7, 8} b) {6} c) {9} d) {7, 8, 9}

2) If $z = 5 + 6i$ then $z + \bar{z}$ = _____

a) 5 b) 6 c) 12i d) 1.0

3) $f(x) = x^4 + 5x^2 - 9$ is

a) A linear function

b) A trignometric function

c) An exponential function

d) A polynomial function

4) If f(x) = cos x then $f'(\pi/2)$ = _____

a) 1 b) –1 c) 0 d) Not defined

P.T.O.

5) Matrix $M = \begin{bmatrix} 7 & 0 \\ 0 & 7 \end{bmatrix}$ is

a) Unit matrix
b) Asymmetric matrix
c) Singular matrix
d) Diagonal matrix

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

1) If K = {a, b, d}, the write the power set of K.

2) If $z_1 = 5 - 2i$ and $z_2 = i$ then find $\frac{z_1}{z_2}$.

3) If $f(x) = 5x^2$ and $g(x) = 2 \sin x$ then find $g_o f$.

4) Evaluate $\lim_{x \to 0} \frac{5^{2x} - 1}{4x}$.

5) If $f(x) = 3 \log x - 3^x$ then find $f'(x)$.

6) Evaluate $\int (5 \tan^2 x - x)\, dx$.

7) Evaluate $\begin{bmatrix} 5 & 6 \\ 0 & 2 \end{bmatrix} - 3 \begin{bmatrix} 7 & 1 \\ 2 & 5 \end{bmatrix}$.

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

1) If A = {1, 2, 3, 4} B = {3, 4, 5, 6}
C = {4, 5, 6, 7, 8} and X = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10} then find

i) $A \cup B \cup C$
ii) $A \cap B \cap C$
iii) $A' - C$
iv) $C' \cap B$
v) $A' \cup B$.

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

3) Evaluate $\int 5x \log x \, dx$.

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

1) Examine the maxima and minima of the function
$f(x) = 2x^3 - 21x^2 + 72x + 10$
Also find the maximum and minimum values of f(x).

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

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \\ 2 & 6 & 5 \end{bmatrix}.$$

PAPER – II

(Introduction to Tissue Culture)

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

1) Highest concentration of Auxin exists at the _____

a) Growing tips of plants b) Leaves
c) Base of any plant organ d) In xylem of phloem

2) Stomata were more open in plants grown in presence of higher _____ concentration.

a) Magnesium b) Calcium
c) Sodium d) Uranium

3) _____ of cultured cell is increased by increased attachment of cells to substrate.

a) Viscosity b) Density
c) Efficiency d) Growth

4) _____ is the largest organ in human body.

a) Lungs b) Intestine
c) Kidney d) Skin

5) _____ cells have finite life span on artificial medium.

a) Normal b) Defected
c) Tumour d) Cancerous

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

   1) Media room in PTC.

   2) Acclimatization.

   3) Artificial seed.

   4) Role of inverted microscope.

   5) Primary cell line.

   6) Organ culture.

   7) Green house.

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

      1) Discuss somatic embryogenesis.

      2) Explain cold trypsinization.

      3) Explain different methods of isolation of protoplast.

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

      1) Explain laboratory design for plant tissue culture.

      2) Discuss the role of different constituents of serum.

SLR-X – 10

Seat No.	

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

Day and Date : Tuesday, 5-4-2016 Max. Marks : 70
Time : 10.30 a.m. to 1.00 p.m.

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

PAPER – I

(Taxonomy)

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

1) Binomial nomenclature was proposed by _____

a) Darwin b) Mendel c) De vries d) Linnaeus

2) Mytilus belongs to class _____

a) Pelecypoda b) Gastropoda c) Amphineura d) Cephalopoda

3) _____ are the flowering plants.

a) Brayophytes b) Pteridophytes

c) Gymnosperms d) Angiosperms

4) Cell wall is absent in _____

a) Mycoplasma b) Bacteria c) Plant cell d) Rickttesia

5) Water vascular system is identification of _____

a) Mollusca b) Coelentrata

c) Echinodermata d) Porifera

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

i) Enlist principles of ICBN.

ii) Give characteristics of Archaebacteria.

iii) Define Taxonomy.

iv) Enlist characters of Chondrichthyes fishes.

v) Structure of flower.

vi) Write a note on mycoplasma.

vii) Give systematic position of Balanoglossus.

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

i) Agnatha

ii) Significance of Algae

iii) Phylogenetic scheme of classification.

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

i) Explain in detail salient features of phylum Arthropoda enlist classes with example.

ii) Describe in detail five kingdom system with example.

PAPER – II

(Computer Science)

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

1) The file extension of MS-Word is _____

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

2) Second generation computers are made of _____

a) Vaccum tubes b) Transistors

c) VISI d) None of these

3) The processor which performs arithmetical and Logical operations is called _____

a) ALU b) Control c) Register d) Cache memory

4) LAN stands for _____

a) Locate Area Network b) Local Area Network

c) Link Area Network d) None of these

5) _____ is a graphical representation of data.

a) Flowchart b) Algorithm

c) Pseudocode d) None of these

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

1) Data and information.

2) Algorithm.

3) Internet.

4) ALU.

5) Network.

6) Write any five input device.

7) Operating system.

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

I) Draw the diagram of computer organization.

II) Explain flowchart with its symbols.

III) Explain LAN, MAN, WAN in detail.

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

I) Write a note on computer generations.

II) Explain what is an operating system with its types.

_____

SLR-X – 11

Seat No.	

B.Sc. – II (Biotechnology) (Semester – III) (CGPA) Examination, 2016
INHERITANCE BIOLOGY (New)

Day and Date : Wednesday, 6-4-2016 Total Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

***Instructions** : 1) **All** questions carry **equal** marks.*

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

*3) Draw **neat** and **labeled** diagrams.*

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

1) _____ different types of gametes were produced by dihybrid individual.

a) One b) Two c) Four d) Eight

2) In dihybrid test cross the ratio of dominants to recessive is

a) 9 : 3 : 3 : 1 b) 1 : 1 : 1 : 1

c) 9 : 3 : 4 d) 1 : 2 : 1

3) _____ number of linkage groups present in human beings.

a) 24 b) 23 c) 46 d) 48

4) In the incomplete dominance both the alleles are _____ expressed.

a) Alternately b) Partially c) Fully d) Equally

5) Cytoplasmic units of inheritance are called

a) Determiner b) Plasmon

c) Gene d) Plasmagene

6) _____ mutants in the yeast were first discovered by B. Ephrussi.

a) Lac b) Auxotrophic c) Petite d) None of these

7) Excess growth of hairs on the pinna is called as

a) Hemophilia b) Color blindness

c) Hypertrichosis d) Night blindness

8) Haplo-diploid sex determination system is found in

a) Honeybee b) Human being

c) Birds d) All of these

9) _____ plasmids play important role in the conjugation process.

a) Ti b) F

c) pUC18 d) pBR322

10) In 1928 F. Griffith discovered process of _____ in bacteria.

a) Transduction b) Transfection

c) Transformation d) Transcription

11) Extranuclear genes are located in

a) Lysosomes and chloroplast b) Lysosomes and mitochondria

c) Ribosomes and chloroplast d) Mitochondria and chloroplast

12) Holandric genes are situated on

a) X chromosome b) Y chromosome

c) X and Y chromosome d) None of these

13) Mendel did not propose

a) Segregation b) Dominance

c) Independent assortment d) Incomplete dominance

14) Crossing over brings about

a) Cytoplasmic reorganization b) Recombination of genes

c) Complete linkage d) No significant change

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

   i) What is Co-dominance ?

   ii) What are inhibitory genes ?

   iii) Give types of linkage.

   iv) Write significance of crossing over.

   v) What are plasmids ?

   vi) What are alleles ?

   vii) Holandric genes.

   viii) Criss-cross inheritance.

   ix) Define recombination.

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

   i) Explain role of 'F' plasmids in conjugation process.

   ii) Describe process mapping by tetrad analysis.

   iii) Explain genetic system in mitochondria.

   B) Describe the structure of typical X and Y chromosome in human being. **4**

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

   i) Describe process of transformation in bacteria.

   ii) Explain multiple alleles with any two suitable examples.

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

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

   i) Explain supplementary and complementary gene action with suitable example.

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

   iii) Prove law of independent assortment with suitable example.

SLR-X – 12

Seat No.	

B.Sc. – II (Biotechnology) (Semester – III) (New CGPA) Examination, 2016
CYTOGENETICS AND POPULATION GENETICS

Day and Date : Thursday, 7-4-2016 Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

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

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

1) The chromosome without centromere is
   a) Centric b) Polycentric c) Acentric d) Dicentric

2) The Mutagenicity of various chemicals is investigated by
   a) AME'S Test b) Replica plate technique
   c) Clb technique d) Attached X Chromosome Technique

3) The proportion of different alleles of a gene present in a Mendelian population is
   a) Gene pool b) Gene Frequency
   c) Genotype Frequency d) Gametic pool

4) After meiosis, chromosome number in newly formed daughter cell is
   a) 2n b) n c) 4n d) 2n + 1

5) Deletions of chromosome 5 results in
   a) Turner's syndrome b) Cri-du-chat syndrome
   c) XYY syndrome d) Patau's syndrome

6) Genes located on the loops of lampbrush chromosomes is
   a) Holandric genes b) Sex linked gene
   c) Slave genes d) Jumping genes

7) Transposable elements was first discovered by Barbara McClintock in
   a) Sugarcane b) Maize c) Tomato d) Garden pea

8) SINES stands for
   a) Short Interspersed Nuclear Sequences
   b) Small Interspersed Nuclear Sequences
   c) Small Interrelated Nuclear Sequences
   d) Short Interrelated Nuclear Sequences

9) The diameter of nucleosome assembly is _____ nm.
   a) 8 b) 9 c) 6 d) 11

10) The most commonly used absolute measure of dispersion is
   a) Variance b) Range c) Mode d) Standard deviation

11) The size of inverted terminal repeats in complex Transposons is
   a) 38 Nucleotide pair b) 48 Nucleotide pair
   c) 58 Nucleotide pair d) 28 Nucleotide pair

12) Mutual exchange of chromosome segments between non-homologous chromosomes is called
   a) Duplication b) Deletion c) Translocation d) Inversion

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

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

1) What is Karyotyping ?
2) What is Trisomy ?
3) What is Transposition ?
4) Define Gene Frequency.
5) Define Standard Deviation.
6) What are Insertion Sequences ?
7) Define Euploidy.
8) What is Heterochromatin ?
9) What is a Microsatellite DNA ?

3. A) Attempt **any two** of the following : **10**
   1) Explain in detail types of mutagenic agents and its effect.
   2) Describe the structure of chromosomes.
   3) Write about mini-satellite DNA.

   B) Solve. **4**

   Explain about the organization of eukaryotic chromosome.

4. Attempt **any two** of the following : **14**
   1) Describe the Genetic basis of Evolution in Brassica and Wheat.
   2) Explain the process of meiosis with neat labeled diagram.
   3) Explain the detail the numerical alteration in chromosome.

5. Attempt **any two** of the following : **14**
   1) Explain Hardy Weinberg Law and its applications.
   2) Describe the structure of lampbrush and polytene chromosome.
   3) Explain different methods used to detect mutation with its applications.

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SLR-X – 13

Seat No.	

B.Sc. – II (Semester – III) (New) (CGPA) (Biotechnology) Examination, 2016
BIOPHYSICAL INSTRUMENTS

Day and Date : Saturday, 9-4-2016 Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

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

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

1) Which of the following components of a monochromator is the dispersing element ?
   a) The collimating lens
   b) The entrance slit
   c) The diffraction grating
   d) All of the above

2) In the equation $A = \in bc$, what quantity is represented by "$\in$" ?
   a) Absorbtivity b) Molar absorbtivity
   c) Path length d) Transmittance

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

P.T.O.

4) Which of the following is not an acid ?
   a) HNO_3 b) CH_3COOH
   c) H_2SO_4 d) All of these are acids

5) The force applied on sedimenting particle at rotational movement is
   a) Centripetal force b) Gravitational force
   c) Centrifugal force d) Rotational force

6) Which of the following separation method is suited for a protein sample with large differences in molecular mass ?
   a) Dialysis
   b) Salting out process
   c) Density gradient centrifugation
   d) Rate zonal centrifugation

7) The magnification of scanning electron microscope ranges from
   a) 10X to 100,000X
   b) 100 X to 10,000X
   c) 1X to 100X
   d) 10X to 10,000X

8) Which of the following is not a part of the optical system of a compound microscope ?
   a) Ocular lens b) Illuminator
   c) Condenser d) Fine adjustment

9) A Geiger Muller counter measures
   a) The arrival of individual photons of ionising radiation or high energy particles
   b) The incidence of heat
   c) The incidence of light
   d) Electronic pulses

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

11) Which of the following reagents used in flow cytometry is a mutagenic agent ?
   a) Propidium iodide
   b) Sodium iodide
   c) 0.9% NaCl solution
   d) Phosphate Buffer Saline (PBS)

12) When placed in a magnetic field all the random spins of the nuclei ?
   a) Stop
   b) Reverse direction
   c) Align with the magnetic field
   d) All of the above

13) Which of the following wavelength falls in the range of X-rays ?
   a) 0.1 A b) 2A
   c) 20A d) 0.2 A

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

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

1) Give the distribution of the electromagnetic spectrum.
2) Explain in detail the errors in pH measurement.
3) Define sedimentation.
4) Draw and explain the image formed by a compound microscope.
5) Define dose equivalent.
6) Give the applications of circular dichroism.
7) Give the principle of a colorimeter.
8) What is a photon ?
9) Explain decay constant of radioactive substances.

3. A) Attempt **any two** of the following : **10**
   1) Give the principle and working of atomic absorption spectroscopy.
   2) Give the different types of rotors of a centrifuge.
   3) Give the importance of Fluorescence microscope.

   B) Solve :
   Explain the technique of NMR for molecular characterization. **4**

4. Attempt **any two** of the following : **14**
   1) Explain the operation and calibration of pH electrode.
   2) Give the applications of electron microscopes.
   3) Explain the role of flow cytometer in cell separation.

5. Attempt **any two** of the following : **14**
   1) Give the instrumentation and working of an Infra Red spectroscopy.
   2) Derive an equation to explain the relationship of rpm and RCF.
   3) Explain in detail the different techniques of detection of radioactivity.

SLR-X – 14

Seat No.	

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

Day and Date : Monday, 11-4-2016 Max. Marks : 70
Time : 2.30 p.m. to 5.00 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 : **14**

1) Migration rate under unit potential gradient is known as _____
   a) Intensity b) Resistivity c) Absorptivity d) Mobility

2) Which of the following is the most suitable gas to use as a carrier gas in GLC ?
   a) Methane b) Carbon dioxide c) Helium d) Oxygen

3) _____ is the process of precipitation of proteins in solution by the addition of large amount of inorganic salt.
   a) Salting in b) Salting out
   c) Western blotting d) SDS-PAGE

4) In biological term_____ occurs at the barrier between blood and in the renal capsule.
   a) Ultrafiltration b) Centrifugation
   c) Paper filtration d) Macrofiltration

5) In which technique pH gradient in gel is used for separation ?
   a) PAGE b) Agarose gel electrophoresis
   c) Paper electrophoresis d) Isoelectrofocussing

P.T.O.

6) High Performance Liquid Chromatography (HPLC) cannot be used to_____
   a) Identify the various pigments from a leaf extract
   b) Determine the mercury content of a fish sample
   c) Separate types of organic pesticides
   d) Determine the caffeine content of coffee samples

7) _____ and _____ invented 2-D gel electrophoresis independently of each other.
   a) Klose, Muller
   b) O'Farrel, Klose
   c) Muller, Farrel
   d) Muller, Wilkin

8) _____ instrument uses sound waves for cell disruption.
   a) Ultra-Sonicator
   b) Ultra Centrifuge
   c) Colorimeter
   d) Gel Doc

9) _____ is the branch of functional genomics.
   a) Polypeptide
   b) Peptide
   c) Proteome
   d) Proteomics

10) Coomassie brilliant blue-protein complex absorbs maximum at _____ nm.
   a) 200 b) 260 c) 462 d) 340

11) _____ method used for estimation of Aldopentoses specifically.
   a) DNSA b) Anthrone c) Bradford d) Orcinol

12) p^H of the stacking gel is_____
   a) 6.3 b) 7.3 c) 5.3 d) 6.9

13) Chromatography is_____method for separation of compounds.
   a) Mechanical
   b) Chemical
   c) Biological
   d) Physical

14) Lowry Assay developed by Oliver D. Lowry in _____
   a) 1910 b) 1930 c) 1940 d) 1920

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

   1) Write a note on agarose as support media.

   2) Draw neat and labeled diagram of GLC.

   3) Explain osmotic shock as a physical method of cell disruption.

   4) Write a short note on safonification value of fat.

   5) How will you prepare protein for microsequencing ?

   6) Explain how SDS carries out cell disruption.

   7) Explain the principle of anthrone method.

   8) Describe lithium borohydrite method of C-terminal sequencing.

   9) Write applications of 2-D gel electrophoresis.

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

      1) Describe the southern blotting.

      2) Explain the chromatographic technique which uses extremely specific biological interaction between two molecules for their separation.

      3) Discuss in detail ultrafiltration.

   B) How is the estimation of nucleic acids done by using different methods ? Explain. **4**

4. Answer the following **(any two)** : **14**

   1) Write a note on DNSA method of carbohydrate estimation.

   2) Explain mass spectroscopy of proteins and peptides.

   3) Discuss in detail paper electrophoresis.

5. Answer the following **(any two)** : **14**

   1) Describe ion exchange chromatographic technique for separation of molecule.

   2) Discuss Bradford's assay for protein estimation with advantages and disadvantages.

   3) Give details of possibilities of MALDI-TOF.

SLR-X – 15

Seat No.	

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

Day and Date : Tuesday, 12-4-2016 Max. Marks : 70

Time : 2.30 p.m. to 5.00 p.m.

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

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

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

i) A suitable organism in preparation of recombinant vaccine is _____ virus.
   a) Influenza b) Polio c) Vaccinia d) none of these

ii) ABO blood group system is discovered by
   a) Karl Landstenier b) Lewin
   c) De Varies d) None of these

iii) Eyelens protein is an example of
   a) hidden antigen b) Isoantigen
   c) Hapten d) None of these

iv) _____ is organ specific autoimmune disease.
   a) Rheumatoid arthritis b) Systemic lupus erythematosus
   c) Graves disease d) none of these

v) Passive immunization is done by using
   a) vaccines b) toxoids c) immune sera d) toxins

vi) _____ is primary mediator of anaphylaxis.
   a) Histamine b) Prostaglandins
   c) Leukotrienes d) Platelet activating factor

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

P.T.O.

viii) Lysozyme is present in

a) Saliva b) CSP c) Sweat d) Urine

ix) Matured antibody secreting cells are called

a) Plasma cell b) Immunoblast

c) T cells d) Neutrophils

x) BCG vaccine is _____ type of vaccine.

a) Live attenuated b) Killed

c) Toxoid d) Toxin

xi) T cells are matured in

a) Bone marrow b) Thymus c) Spleen d) None of these

xii) Blood group antigens are present on _____.

a) Leucocytes b) Erythrocytes

c) Platelets d) NK cells

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

a) Fas pathway b) Perforin/Granzyme pathway

c) Both pathways d) None of these pathway

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

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

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

i) Define Phagocytosis and inflammation.

ii) Define Active and passive immunization.

iii) Define Autoimmunity and give examples of autoimmune diseases.

iv) Give Gell and Coombs classification of Hypersensitivity.

v) Define hypersensitivity.

vi) Give applications of blood group.

vii) Define humoral immunity.

viii) Define innate and acquired immunity.

ix) Give examples of non-organ specific autoimmune diseases.

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

i) Write an account on First line of defence.

ii) Explain mechanism of immunity to bacteria.

iii) Explain mechanism of anaphylaxis.

B) Explain general mechanism of autoimmunity. **4**

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

i) Mechanism of antibody production against T Independent and T dependent antigens.

ii) Give an account on monoclonal antibody production.

iii) Explain primary and secondary immune response.

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

i) Write a note on ABO and Rh blood group system.

ii) Write a note on maturation, activation and differentiation of B cell.

iii) Types of vaccines.

iv) Explain mechanism of inflammation.

SLR-X – 16

Seat No.	

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

Day and Date : Wednesday, 13-4-2016 Max. Marks : 70
Time : 2.30 p.m. to 5.00 p.m.

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

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

i) Hematopoitic-inducing microenvironment (HIM) is provided by
   a) Progenitor cells b) Erythrocytes
   c) Stromal cells d) NK cells

ii) _____ is the common marker on T cells.
   a) CD3 b) CD4 c) CD8 d) B7

iii) Germinal centers of lymphoid tissues are largely contains
   a) Macrophages b) Neutrophils c) T cells d) B cells

iv) Example of mucosa-associated lymphoid tissue is
   a) Thymus b) Peyer's patches
   c) Spleen d) Lymph node

v) Class I MHC are recognized by TCRs of _____ cells.
   a) CD4 b) CD8
   c) B d) Antigen presenting

vi) Interleukin (IL-2) is produced by
   a) B cells b) Macrophages
   c) T_H cells d) Neutrophils

vii) The alternative complement activation pathway is inhibited by factor
   a) H b) B c) D d) P

P.T.O.

viii) _____ is most likely to induce a strong immune response.
a) nucleic acid b) glycolipid
c) phospholipid d) glycoprotein

ix) Serum IgM molecules usually contain
a) 10 light chains b) 10 heavy chains
c) Joining chain d) All of these

x) Viral antigens are processed and presented by _____ pathway.
a) Endocytic b) Cytosolic
c) Class II MHC d) Complement

xi) Humoral immunity is induced after processing and presentation of antigen by _____ pathway.
a) Class I MHC b) Endocytic c) Cytosolic d) Cytokine

xii) Tritium (^{3}H) and Iodine (^{125}I) are used in _____ test.
a) Radioimmunoassay b) Immunofluorescence
c) ELISA d) Agglutination

xiii) End products of enzyme-substrate reaction are analysed in _____ test.
a) Radioimmunoassay b) Immunofluorescence
c) ELISA d) Precipitation

xiv) In Complement Fixation Test (CFT) amboceptor is
a) Rabbit RBCs b) Sheep RBCs
c) Horse RBCs d) Anti-Sheep RBCs

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

i) MHC
ii) Precipitation
iii) Agglutination
iv) Opsonization
v) Immunological specificity
vi) Epitope
vii) Cascade mechanism
viii) Apoptosis
ix) Homeostasis.

3. A) Answer **any two** of the following : **10**
   i) Explain the hematopoisis.
   ii) Explain structure and function of class II MHC.
   iii) Explain types of antigens with suitable examples.

   B) Explain the basic structure of antibody. **4**

4. Answer **any two** of the following : **14**
   i) Explain the antigen processing and presentation by Cytosolic pathway.
   ii) Write an essay on various immunodiffusion techniques.
   iii) Explain the properties of Cytokines.

5. Answer **any two** of the following : **14**
   i) Write an essay on structure and functions of lymph node.
   ii) Write an essay on classical complement activation pathway.
   iii) Explain any two immune cells in detail.

SLR-X – 17

Seat No.	

B.Sc. – II (Biotechnology) (Semester – III) (Old) Examination, 2016
GENETICS
Inheritance Biology – I

Day and Date : Wednesday, 6-4-2016 Max. Marks : 50
Time : 2.30 p.m. to 4.30 p.m.

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

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

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

2) In _____ both phenotypic and genotypic ratio is same.
   a) Incomplete dominance b) Co-dominance
   c) Epistasis d) Both a) and b)

3) The method of construction of maps of different chromosomes is called _____
   a) Genetic mapping b) Linkage mapping
   c) Cross over map d) All of these

4) The intergene distance on the chromosomes can be measured in terms of _____ units.
   a) Watson b) Morgan c) Angstrom d) Roux

5) The smallest extra chromosomal unit is called _____
   a) Determiner b) Plasmon c) Gene d) Plasmagene

6) Petite mutants in yeast were discovered by _____
   a) T. H. Morgan b) B. Ephrussi c) Mendel d) Johansen

7) _____ is a Y-linked disease.
   a) Hemophilia b) Color blindness
   c) Hypertrichosis d) Night blindness

8) In human being _____ type of sex determination system is present.
   a) ZZ-ZW b) Haplo-diploid c) XX-XC d) XX-XY

9) Conjugation is an example of _____

a) Sexual reproduction b) Asexual reproduction

c) Vegetative reproduction d) None of these

10) Transformation was first discovered by _____

a) Lederberg b) Tatum

c) Griffith d) Hershy and Chase

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

i) What is test cross ?

ii) Give significance of linkage.

iii) What are pseudo alleles ?

iv) Sex determination in birds.

v) What are F plasmids ?

vi) Law of dominance.

3. A) Answer the following **(any 2)** : **6**

i) Write a note on complementary genes.

ii) Describe mechanism of crossing over.

iii) Explain multiple alleles with suitable example.

B) Describe inheritance of X linked genes with suitable example. **4**

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

i) Explain in detail bacterial transformation.

ii) Describe the structure of typical X and Y chromosome.

iii) Explain genetic system in mitochondria.

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

i) Describe different types of linkage.

ii) Write note on conjugation in bacteria.

iii) Describe law of independent assortment with suitable example.

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SLR-X – 18

Seat No.	

B.Sc. – II (Biotechnology) (Semester – III) (Old) Examination, 2016
GENETICS
Cytogenetics and Population Genetics – II

Day and Date : Thursday, 7-4-2016 Max. Marks : 50

Time : 2.30 p.m. to 4.30 p.m.

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

1. Rewrite the sentence by choosing the correct alternatives. **10**

1) The chromosome without centrome is
   a) Centric b) Poly centric c) Acentric d) Dicentric

2) Mutual exchange of chromosome segment between non-Homologous chromosome is called
   a) Duplication b) Deletion c) Translocation d) Inversion

3) SINES stands for
   a) Short Interspersed Nuclear Sequences
   b) Small Interspersed Nuclear Sequences
   c) Small Interrelated Nuclear Sequences
   d) Short Interrelated Nuclear Sequences

4) The most commonly used absolute measure of dispersion is
   a) Variance b) Range c) Mode d) Standard deviation

5) Transposable elements was first discovered by _____ in 1958.
   a) Barbara Mcclintock b) H.J. Muller
   c) T.H. Morgan d) G.J. Mendel

6) The end of chromosome is known as
   a) Telomere b) Centromere c) Chromomere d) All of these

7) The mutagenic agent which is a non-ionizing radiation is
   a) UV rays b) X-rays c) Beta-rays d) Alpha-rays

P.T.O.

8) The sum total of genes present in the gametes of a population is
   a) Gene pool b) Gametic pool c) Zygotic pool d) None of these
9) Auxotrophic mutants can be detected by _____ technique.
   a) Replica plate b) Ames test
   c) C and B test d) XXY test
10) _____ chemical compound used to induce polyploidy in plants.
   a) Cytokinin b) Gibberellic acid
   c) Auxin d) Colchicine

2. Answer the following (**any 5**) : **10**
   1) What is a Nucleosome ?
   2) What are Telomere ?
   3) What is Cytokinesis ?
   4) What is spontaneous mutation ?
   5) Define Inbreeding.
   6) Define standard deviation.

3. A) Answer the following (**any 2**) : **6**
      1) Explain type of chromosome based on the position of their centromere ?
      2) Write about insertion sequences ?
      3) Write about Aneuploidy ?
   B) Write in detail about the process of meiosis. **4**

4. Answer the following (**any 2**) : **10**
   1) Explain in detail about the Mutagenic agents.
   2) Describe the polytene chromosome.
   3) Write about Mini satellite DNA.

5. Answer the following (**any 2**) : **10**
   1) Write in detail about Hardy-Weinberg Law.
   2) Describe the Genetic basis of Evolution on brassica and wheat.
   3) Write about Multiple factor hypothesis.

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SLR-X – 19

Seat No.	

B.Sc. Biotechnology (Part – II) (Semester – III) (Old) Examination, 2016
BIOTECHNIQUES
Biophysical Techniques – I

Day and Date : Saturday, 9-4-2016 Total Marks : 50
Time : 2.30 p.m. to 4.30 p.m.

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

1. Rewrite the sentence using correct alternative given below : **10**

1) Photomultiplier is generally used in the detector for the _____ analysis of electromagnetic spectrum.
   A) Spectroscopic
   B) Gravimetric
   C) Electrophoretic
   D) Chromatographic

2) For generation of visible radiations, the _____ lamp is used as a source in spectroscopy.
   A) Hydrogen B) Duterium
   C) Halogen D) Tungsten

3) Circular dichroism is used for analyzing the differential absorption of _____ light.
   A) Monochromatic B) Scattered
   C) Polarized D) Reflected

4) Pulses of light generated due to ionization of a material by incident radiation are detected in _____
   A) X-ray diffraction
   B) Flow Cytometry
   C) GM counter
   D) Scintillation counter

P.T.O.

5) The frequency of molecular vibrations range from _____
   A) 10^5 to 10^8 Hz
   B) 10^8 to 10^{11} Hz
   C) 10^{12} to 10^{14} Hz
   D) 10^6 to 10^9 Hz

6) Density gradient of _____ is used for the density based separation of DNA molecules.
   A) Caesium chloride
   B) Sucrose
   C) Glycerol
   D) Agarose

7) The nucleus is unstable, if the neutron proton ratio is less than _____
   A) 1 : 2 B) 1 : 1
   C) 1 : 5 D) 1 : 3

8) The degree of attenuation of a radiant beam incident on particles suspended in a medium can be measured by _____
   A) Turbidometry
   B) NMR
   C) Flow Cytometry
   D) XRD

9) A three dimensional visualization of a sample typically by using the light reflected by object's surface can be achieved by using _____ microscope.
   A) Compound B) Inverted
   C) Dissecting D) Dark field

10) The mean energy imparted to matter per unit mass by ionizing radiation is known as _____
   A) Effective dose equivalent
   B) Dose equivalent
   C) Ambient dose equivalent
   D) Absorbed dose

2. Answer **any five** of the following : **10**
   1) Explain the reason for deviation from Beer's law.
   2) Draw the image formation in a compound microscope.
   3) Explain the use of indicators for pH measurement.
   4) State the properties of gamma radiations.
   5) Differentiate between the types of rotors used for centrifugation.
   6) State any two hazardous biological effects of radiations.
   7) How the X-ray diffraction technique can be used for molecular characterization. ?

3. A) Answer **any two** of the following : **6**
      1) Write about molecular energy levels of an electromagnetic spectrum.
      2) Explain the optical principle of dark field microscopy.
      3) State the biological applications of radioisotopes.

   B) Discuss the errors in the measurement of pH. **4**

4. Answer **any two** of the following : **10**
   1) Describe the construction, working and applications of UV visible spectroscopy.
   2) Illustrate the principle, working and applications of flow cytometry.
   3) Write an account on radioactive dosimetry.

5. Answer **any two** of the following : **10**
   1) Illustrate different techniques used for detection of radioactivity.
   2) Write an account on analytical ultracentrifugation.
   3) Describe the design and practice of different types electron microscopy.

SLR-X – 20

Seat No.	

B.Sc. – II (Biotechnology) (Semester – III) (Old) Examination, 2016
BIOTECHNIQUES
Biochemical Techniques – II

Day and Date : Monday, 11-4-2016 Total Marks : 50

Time : 2.30 p.m. to 4.30 p.m.

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

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

1) Moving boundary electrophoresis is discovered by _____
   a) Konig b) Tiselius c) Gorden d) Skoog

2) _____ constructed first working dialyzer in1943.
   a) Willem Kolff b) Ronald Ross c) Morris Wilkins d) Nakamura

3) Electrophoresis in _____ gel is referred as PAGE.
   a) Agar b) Starch c) Agarose d) Acrylamide

4) _____ is a faster purification technique than dialysis.
   a) Ultrafiltration b) Immobilization
   c) Ultracentrifugation d) Cell disruption

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

6) In 1994 _____ coined the term proteome into the scientific community.
   a) Mark Webber b) Rutherford
   c) Filipe Anderson d) Marc Wilkins

7) Volume of _____ per unit time is known as flow rate.
   a) Stationary phase b) Slurry
   c) Sample d) Mobile phase

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

9) BCA stands for _____
   a) Bromide Catalytic Assay b) Bergmanns Centrifugation Assay
   c) Bicinchoninic Acid Assay d) Baltimore's Citrate Assay

10) _____ is not used to stain the proteins on gel.
   a) SYPRO b) Silver stain c) Eosin Y d) Ethidium bromide

2. Answer the following (**any five**) : **10**
   1) Write a general account on electrophoresis.
   2) Define partition coefficient.
   3) Write a note on solvent extraction.
   4) Describe denaturing precipitation.
   5) Define :
      (a) proteomics (b) functional genomics.
   6) Write a short note on immobilization.

3. A) Answer the following (**any two**) : **6**
      1) Explain ammonium sulphate precipitation of protein.
      2) Write a note on dialysis process.
      3) Explain in detail autoradiography.

   B) Discuss basic principle of elecrtophoresis. **4**

4. Answer the following (**any two**) : **10**
   1) Give details of western blotting.
   2) Discuss in detail GLC.
   3) Explain BCA assay.

5. Answer the following (**any two**) : **10**
   1) Explain edman degradation for microsequencing.
   2) Describe in detail ELISA.
   3) Give details of SDS-PAGE without stacker.

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SLR-X – 21

Seat No.	

B.Sc. – II (Semester – III) (Biotechnology) Examination, 2016
IMMUNOLOGY (Cells and Organs of Immunity) – I (Old)

Day and Date : Tuesday, 12-4-2016 Max. Marks : 50

Time : 2.30 p.m. to 4.30 p.m.

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

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

i) Widal test is example of _____ reaction.
a) Agglutination b) Precipitation
c) Complement fixation d) None of these

ii) Stem cells arise from
a) Yolk sac b) Feotal liver c) Bone marrow d) All of these

iii) _____ is hydrolytic system of phagocytes.
a) Phagosomes b) Lysosomes c) Mesosomes d) Ribosomes

iv) The antigens involved in rejection of graft are _____ antigens.
a) Auto b) MHC c) Pro d) Heterophile

v) Antibody labeled with enzymes are used in _____ test.
a) ELISA b) Immunofluorescence
c) Complement fixation d) Agglutination

vi) In secondary immune response initiation of antibody production starts from
a) Memory cells b) B clone cells c) T_H cells d) T_C cells

vii) The reaction between soluble antigen and antibodies results into
a) Precipitation b) Agglutination
c) Complement fixation d) None of these

viii) In alternate pathway binding of _____ stabilises the C3bBb (C3 convertase).
a) Serine protease b) Lectin c) Properdin d) None of these

P.T.O.

ix) _____ act as site for maturation of T lymphocytes.

a) Bone marrow b) Lymphnode

c) Thymus d) MALT

x) The property of two or more cytokines having additive effects is called as

a) redundancy b) synergy

c) antagonism d) pleiotropism

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

i) Homeostasis.

ii) Opsonization.

iii) Apoptosis.

iv) Secondary lymphoid organs.

v) Immunogenicity and antigenicity.

vi) Redundancy.

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

i) Explain alternate pathway.

ii) Write in detail account on radioimmunoassay.

iii) Write in brief on structure and function of thymus.

B) Write an account on principle of antigen-antibody interaction. **4**

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

i) Explain processing and presentation of exogenous antigen in detail.

ii) Write an account on structure and function of MHC class II molecule.

iii) Write an essay on mechanism of hematopoiesis.

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

i) Explain different methods of immunodiffusion.

ii) Write an essay on structure and function of antibody molecule.

iii) Write an essay on cytokine receptor families.

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SLR-X – 22

Seat No.	

B.Sc. – II (Semester – III) Examination, 2016
(Biotechnology)
IMMUNOLOGY- IMMUNE EFFECTOR MECHANISMS – II (Old)

Day and Date : Wednesday, 13-4-2016 Total Marks : 50
Time : 2.30 p.m. to 4.30 p.m.

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

1. Choose the correct alternative and rewrite the sentences again. **10**

i) _____ discovered ABO blood group system.
   a) Tshemark b) D-Varies
   c) Landstanier d) None of them

ii) Person having _____ blood group is called as universal acceptor.
   a) A b) O
   c) B d) AB

iii) Active immunization is done by using
   a) Readymade antibodies b) Vaccines
   c) Immune sera d) None of these

iv) _____ lymphocyte is involved in cell-mediated immune response.
   a) T b) T and B
   c) B d) None of these

v) _____ is major antibody produced in primary immune response.
   a) Ig G b) Ig M
   c) Ig D d) Ig A

P.T.O.

vi) Interleukin (IL-2) is produced by

a) B cells b) Macrophages

c) T_H cells d) Neutrophils

vii) _____ antibody is involved in Type I hypersensitivity reactions.

a) Ig G b) Ig M

c) Ig D d) Ig E

viii) The transfer of graft from donar to recipient belongs to different species is called

a) Isograft b) Allograft

c) Xenograft d) Autograft

ix) Hashimoto disease is example of _____ autoimmune disease.

a) Organ specific b) Non-organ specific

c) Hemolytic d) None of these

x) The rejection of graft occurs within first 24 hrs is called as

a) Acute b) Hyperacute

c) Chronic d) Passive

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

i) Autoimmunity

ii) Give different types of grafts.

iii) Give Gell and Coombs classification of hypersensitivity.

iv) Define anaphylaxis and atopy.

v) Live attenuated vaccines and give its examples.

vi) Define Acquired and innate immunity.

3. A) Answer **any two** of the following. **6**
   i) Explain the physical barriers of innate immunity.
   ii) Explain mechanism of immunity to protozoal infections.
   iii) Explain Graft Verses Host Disease.

   B) Explain the mechanism of autoimmunity. **4**

4. Answer **any two** of the following. **10**
   i) Explain the mechanism of immunity to bacterial infections.
   ii) Write an essay on types of vaccines.
   iii) Explain synthesis and applications of monoclonal antibodies.

5. Answer **any two** of the following. **10**
   i) Write an essay on organ specific autoimmune diseases.
   ii) Write an essay on humoral immunity.
   iii) Explain an account on Cellular defence mechanisms of host body.

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SLR-X – 23

Seat No.	

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

Day and Date : Saturday, 16-4-2016 Max. Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

Instructions *: 1)* ***All*** *questions are* ***compulsory****.*
2) Draw a ***neat*** *labeled diagram* ***wherever*** *necessary.*

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

1) In nucleic acids, adjacent nucleotides are joined together by
   a) Hydrogen bond b) Disulphide bond
   c) Phosphodiester bond d) Covalent bond

2) Viruses contain
   a) RNA b) DNA
   c) Both DNA and RNA d) hn RNA

3) Circular DNA molecules in E.coli is compacted through the process of
   a) Twisting b) Supercoiling
   c) Relaxing d) Nicking

4) Replication of DNA begins at _____ site.
   a) Ori 'C' b) Dna 'C'
   c) Dna 'B' d) Ori 'B'

5) During replication, lagging stand synthesis is carried out with the help of
   a) DNA primers b) RNA primers
   c) Template d) Guide RNA

6) Semiconservative DNA replication was proved by
   a) Meselson and Stahl b) Singer and Nicholson
   c) Watson and Crick d) T.H. Morghan

7) Proof reading is brought about in prokaryotes by _____ enzyme in Prokaryotes.
   a) DNA polymerase – I b) DNA polymerase – II
   c) DNA polymerase – III d) DNA polymerase – α

P.T.O.

8) Rolling circle model of DNA replication observed in
   a) Bacteria b) Cosmid
   c) Phages d) Eukaryotes

9) _____ is deaminating agent.
   a) SiO_2 b) HNO_3
   c) SO_2 d) H_2SO_4

10) In DNA, internucleotide distance is
   a) 3.4 nm b) 3.4 A°
   c) 34 A° d) 34 nm

11) _____ is not a termination codon.
   a) UAA b) UAG
   c) UGA d) AUG

12) One kilobase DNA is
   a) 100 bp b) 1000 bp
   c) 10,000 bp d) 10 bp

13) In eukaryotic DNA replication process RNA primers are removed by
   a) DNA polymerase – I b) RNA primase
   c) Helicase d) FEN – 1 endonuclease

14) SSBP stands for
   a) Single Strand Binding Profile b) Single Strand Binding protein
   c) Single Strand Binding enzyme d) Single Strand Binding factor

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

1) Define Gene.
2) Define Denaturation.
3) Define Recombination repair.
4) Define Chargaff's gall's rule.
5) Define linking number.
6) Functions of Topoisomerases.
7) Properties of Genetic code in mitochondria.
8) Define Replisome.
9) Okazaki fragments.

3. A) Attempt **any two** of the following : **10**
   1) Describe Blenders expt. of Hershey and Chase
   2) Describe 'Z' form DNA with neat labeled diagram
   3) Explain organization of viral genomes.

   B) Describe structure and types of RNA. **4**

4. Attempt **any two** of the following : **14**
   1) Describe mechanism of replication in prokaryotes.
   2) Explain structure or mitochondrial DNA with neat labeled diagram.
   3) Describe properties of genetic code with suitable example.

5. Attempt **any two** of the following : **14**
   1) Explain enzymology and DNA replication in eukaryotes.
   2) Write about cot curves and its analysis.
   3) Explain nucleotide and base excision repair.

SLR-X – 24

Seat No.	

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

Day and Date : Monday, 18-4-2016 Max. Marks : 70
Time : 10.30 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 labeled diagrams.*

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

1) In eukaryotes, rRNA is synthesized by
   a) RNA polymerase II b) RNA polymerase III
   c) RNA polymerase I d) None of these

2) In eukaryotic transcription process _____ directly binds to TATA box of promoter.
   a) TF-IIH b) TF-IID
   c) TF-IIE d) RNA polymerase II

3) During mRNA processing 7-methyl guanosine cap is formed at _____ end of mRNA molecule.
   a) Only at 5' b) Both 5' and 3' c) Only at 3' d) None of these

4) Ribosome binding site on the mRNA molecule having _____ sequences.
   a) AGGAGGU b) AGGUGGU c) AGGAGGAU d) UCCAUCC

5) In lac operon, transacetylase enzyme is encoded from _____ gene.
   a) lac 'a' b) lac 'b' c) lac 'z' d) lac 'y'

6) In eukaryotic translation process initiator tRNA molecule recognizes _____ codon on mRNA.
   a) AUU b) AGU c) AUG d) UAG

P.T.O.

7) During prokaryotic translation process, translocation is driven by
   a) eEF1 b) eEF2 c) EF-Tu d) EF-G

8) _____ loop of tRNA molecule is called as ribosome binding loop.
   a) Anticodon b) DHU c) CCA site d) None of the above

9) _____ is not a property of genetic code.
   a) Non-ambiguous b) Degeneracy
   c) Non-overlapping d) Ambiguous

10) _____ bonds plays important role in protein folding.
   a) Disulphide b) Phosphate
   c) Polypeptide d) Hydrogen

11) In trp operon model tryptophan is act as _____ molecule.
   a) repressor b) apo-repressor
   c) co-repressor d) inducer

12) _____ is an activator required for high level transcription of the lac operon.
   a) Catabolite activator protein b) Glucose
   c) Regulatory protein d) Galactose

13) _____ is binds to Exonic Splicing Enhancers (ESE) during removal of introns from pre-mRNA molecule.
   a) SR proteins b) U2 snRNP c) U6 snRNP d) U2AF

14) Iron Regulatory Protein (IRP) which binds to a specific sequence in the 5'UTR of the mRNA called the
   a) Iron-response enhancers b) Iron-recognition element
   c) Iron-reserve element d) Iron-response element

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

i) What is transcription bubble ?

ii) Write a note on Fidelity of translation.

iii) What is TBP ?

iv) What are exon shuffling ?

v) What is RNA editing ?

vi) What are transcriptional activators ?

vii) Write a note on mRNA transport.

viii) Write a note on translational repressor.

ix) What are ribosomes ?

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

i) Describe signal transduction in gene regulation with suitable examples.

ii) Describe the process of alternative splicing mechanisms.

iii) Describe structure and function of tRNA.

B) Describe process of mRNA processing in eukaryotes. **4**

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

i) Explain in detail regulation of trp operon in bacteria.

ii) Describe mechanism of translation in prokaryotes.

iii) Describe process of transcription in eukaryotes.

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

i) Explain post-translational modifications in proteins.

ii) Describe process of transcription in prokaryotes.

iii) Explain signal integration in gene regulation with suitable examples.

SLR-X – 25

Seat No.	

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

Day and Date : Wednesday, 20-4-2016 Max. Marks : 70
Time : 10.30 a.m. to 1.00 p.m.

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

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

i) 2-chloroethylphosphonic acid, a chemical compound which release ethylene during decomposition is known as (market trade names) _____
a) Ethrel b) Ethaphon c) Floridimex d) All of these

ii) _____ is most often required for normal growth and development of somatic embryos.
a) Abscisic acid b) Ethylene
c) Ethrel d) Casein hydrolysate

iii) Agar, the most commonly used gelling agent is obtained from _____
a) Fungi b) Bacteria c) Lichens d) Red algae

iv) The ability of a single cell to grow into a whole plant is called _____
a) Pluripotency b) Cell growth c) Totipotency d) Cell division

v) Explants are commonly surface-sterilized by using _____
a) Formalin b) Sodium hypochlorite
c) Nutrient medium d) Sterile water

vi) A nonsexual developmental process that produces a bipolar embryo with a closed vascular system from somatic tissues of a plant is called _____
a) Embryo culture b) Somatic embryogenesis
c) Somaclonal variation d) Organogenesis

vii) The fusion of nucleated cell with enucleated cell leads to form _____

a) Chromosome b) Cybrid

c) Hybrid d) Symmetric hybrid

viii) _____ is the variation which occurs in plants during plant tissue culture.

a) Somatic Hybrid b) Cybrid

c) Somaclonal variation d) Callus

ix) *In vitro* clonal multiplication of a plant species is known as _____

a) Embryogenesis b) Parthenogenesis

c) Somaclonal variation d) Micropropagation

x) Culture of excised anthers to obtain haploid plants is known as _____ culture.

a) Anther b) Meristem c) Callus d) Protoplast

xi) Culture of embryos excised from immature or mature seeds is called as _____

a) Embryo culture b) Somatic embryogenesis

c) Somaclonal variation d) Organogenesis

xii) Callus turns into yellow color due to presence of _____ pigments.

a) Anthocyanin b) Chloroplast

c) Phenols d) Carotenoids

xiii) Indol Acetic Acid (IAA) is a form _____ hormone.

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

xiv) _____ is a vitamin used in Plant Tissue Culture media.

a) Inositol b) Biotin c) Glycine d) Cysteine

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

i) Enlist any 4 vitamins with their importance used in Plant Tissue Culture media.

ii) Name plant growth hormones with their example used to manipulate plant tissues *in vitro*.

iii) Name the different sterilization methods used in tissue culture technique.

iv) Define cell suspension culture.

v) What is a protoplast ?

vi) Define sterilization.

vii) Differentiate between organ culture and organogenesis.

viii) Define cybrid.

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

i) Define Micropropagation and discuss advantages and disadvantages of Micropropagation.

ii) Explain in brief – isolation of protoplast.

iii) What is Embryo culture ? Give the principle of embryo culturing and its applications.

B) Explain in brief – surface sterilization of explant and laboratory fumigation. **4**

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

i) Explain in detail about – Callus culture.

ii) Explain in detail the General Plant Tissue Culture Laboratory Design and Equipments used for Plant Tissue Culture Technique.

iii) Explain in brief – Somaclonal variation.

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

i) Explain in brief the importance, components and preparation of culture media for Plant Tissue Culture.

ii) Explain in detail about – Somatic embryogenesis.

iii) Discuss the anther and pollen culture for haploid production.

SLR-X – 26

Seat No.	

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

Day and Date : Thursday, 21-4-2016 Max. Marks : 70
Time : 10.30 a.m. to 1.00 p.m.

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

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

1) _____ was the first cloned cell strain isolated by capillary cloning.
   a) L929 b) Hella
   c) MCF7 d) BHK

2) _____ described procedure to obtain passaged monolayer culture.
   a) Carrel b) Dulbecco
   c) Butler d) Freshney

3) Which of the following method used for activation of plastic substrate ?
   a) UV Radiation b) Heat
   c) γ Radiation d) Visible light

4) 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

P.T.O.

6) _____ serum is particularly used for more demanding cell lines.
   a) Tiger b) Foetal Bovine
   c) Horse d) Goat

7) _____ is a physical method used to get all the cells in same phase of growth in culture.
   a) TLC b) HPLC
   c) Cell size and sedimentation d) Electrophoresis

8) Most dispersed cell cultures prefer lower _____ tension.
   a) Hydrogen b) Nitrogen
   c) Carbon dioxide d) Oxygen

9) _____ is used as diluent for concentrates of amino acids and vitamins.
   a) BSS b) FBS
   c) CBS d) MS

10) An _____ cell counter is suitable for rapid counting of multiple samples of cells in suspension.
   a) Magnetic b) Electronic
   c) Manual d) Parabolic

11) _____ measurement is probably the best method to use as an indicator for the number of cells in a solid tissue.
   a) Protein b) Lipid
   c) DNA d) Carbohydrate

12) _____ identification can be aided by a banding technique.
   a) Histone b) Protein
   c) MTT d) Chromosome

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

14) Encapsulation of DNA in _____ vesicle is an effective way to improve the efficiency of cellular uptake.
   a) Dextran b) Liposome
   c) Gel d) DEAE-Dextran

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

   1) Write short note on synthetic media.

   2) Write a note on CO_2 incubator.

   3) Explain in brief characteristics of animal cell in culture.

   4) Give brief account on complete media.

   5) Define organ culture.

   6) Write a note on cell separation.

   7) Explain maintenance of cell line.

   8) Write a note on type of product in production strategy.

   9) Write a note on cell determination by DNA.

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

      1) Explain analysis of cell cycle.

      2) Give details of cell synchronization.

      3) Describe mechanical methods of cell separation.

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

4. Answer the following (**any two**) : **14**

   1) Describe in detail serum free media.

   2) Explain in detail laboratory design for ATC.

   3) Discuss enzymatic methods of cell separation.

5. Answer the following (**any two**) : **14**

   1) Discuss in detail cell counting and monitoring.

   2) Describe efficiency and productivity of culture system.

   3) Explain production of blood clotting factors.

SLR-X – 27

Seat No.	

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

Day and Date : Friday, 22-4-2016 Max. Marks : 70
Time : 10.30 a.m. to 1.00 p.m.

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

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

i) Km represents the _____
   a) substrate concentration at maximum velocity
   b) substrate concentration in active site
   c) substrate concentration at half of maximum velocity
   d) substrate specificity of an enzyme

ii) ΔG of a reaction is negative then the reaction is _____
   a) at equilibrium b) spontaneous
   c) endergonic d) steady

iii) The statement that in all natural processes, the entropy of universe increases is given by _____ law of thermodynamics.
   a) 1^{st} b) 2^{nd}
   c) 3^{rd} d) Both 1^{st} and 2^{nd}

iv) _____ reaction is considered as oxidation.
   a) Fe^{3+} + electron $\rightarrow$ Fe^{2+} b) Cu^{2+} + electron $\rightarrow$ Cu^{+}
   c) Fe^{2+} $\rightarrow$ Fe^{3+} + electron d) Fe^{2+} $\leftarrow$ Fe^{3+} + electron

v) The actual free energy change of a reaction depends on _____ prevailing during reaction.
   a) reactant concentration b) product concentration
   c) temperature d) all a, b and c

P.T.O.

vi) In digit Enzyme Commission number the first place indicates _____

a) class b) sub-class

c) sub sub-class d) serial number

vii) Chymotrypsin is activated by _____

a) phosphorylation b) proteolytic cleavage

c) dephosphorylation d) allosteric modification

viii) _____ factor affects the activity of enzyme.

a) pH b) Temperature

c) Substrate concentration d) All a, b and c

ix) _____ is the quantitative expression for the state of randomness or disorder in system.

a) Gibb's free energy b) Enthalpy

c) Entrophy d) Equilibrium constant

x) For spontaneous reaction the sum of entropy of system and surrounding is always _____

a) > 0 b) $= 0$ c) < 0 d) ≤ 0

xi) _____ inhibitor can bind only to free enzyme not to enzyme substrate complex.

a) Competitive b) Uncompetitive

c) Non competitive d) Mixed

xii) The bell shaped curve is obtained for effect of _____ on enzyme activity.

a) enzyme concentration b) substrate concentration

c) temperature d) all of these

xiii) The relationship between free energy, enthalpy and entropy is given by _____

a) $\Delta G = \Delta H - T\Delta S$ b) $\Delta H = \Delta G - T\Delta S$

c) $\Delta S = \Delta G - T\Delta S$ d) $\Delta S = \Delta H - T\Delta G$

xiv) Enzymes having different structural, functional property but having same biological function are known as _____

a) ribozyme b) isozyme

c) abzyme d) apoenzyme

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

   a) What is first law of thermodynamic ?

   b) Explain biological standard state.

   c) Compare the biochemical and chemical equations.

   d) What is holoenzyme ? Give its constituents.

   e) Explain induced fit model.

   f) Write a note on irreversible inhibitor.

   g) Define the term abzyme and ribozyme.

   h) Give the clinical significance of LDH.

   i) Explain the effect of inhibitor on enzyme.

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

      a) Explain biological role of enzymes.

      b) Explain the concept of activation energy in enzyme catalyzed reaction.

      c) Explain in detail phosphate group transfer reaction.

   B) Derive the relation between standard redox potential and free energy change. **4**

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

   a) What is standard free energy change and actual free energy change ? Add a note on its properties.

   b) Explain the aldol condensation reaction and free radical reactions with one example.

   c) Discuss the IUB nomenclature and classification of enzyme.

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

   a) What is allosteric enzyme ? Give an account on allosteric regulation.

   b) Explain in detail competitive and uncompetitive inhibition of enzyme.

   c) What is biological half reactions ? Add a note on electron transfer from biomolecules.

SLR-X – 28

Seat No.	

B.Sc. (Part – II) (Semester – IV) (New CGPA) Examination, 2016
BIOTECHNOLOGY
Paper No. – 20 : Metabolism

Day and Date : Saturday, 23-4-2016 Max. Marks : 70
Time : 10.30 a.m. to 1.00 p.m.

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

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

i) The end product of citric acid cycle is

a) CO_2 and H_2O b) Oxaloacetate
c) Citrate d) Pyruvic acid

ii) Decarboxylation reaction involves the removal of _____ Group from amino acid.

a) amino b) sulphur c) carboxyl d) hydroxyl

iii) Cytochromes contains _____ which is involved in respiration process.

a) iron ions b) FAD c) NAD+ d) Copper ions

iv) β -oxidation takes place in

a) cytoplasm b) mitochondria c) lysomose d) nucleus

v) Net ATP synthesis in glycolysis in aerobic condition

a) 2 b) 6 c) 7 c) 9

vi) The end product of purine metabolism in human is

a) uric acid b) urea c) ammonia d) xanthine

vii) _____ acts as energy reserve of the body.

a) Glycerol b) Cholesterol c) Phospholipids d) Triacylglycerol

P.T.O.

viii) Pentose phosphate pathway is concerned with the biosynthesis of

a) NAD^+ b) NADH c) NADPH d) $FADH_2$

ix) Photosystem I has reaction centre designated as

a) P 700 b) P 680 c) P 860 d) P 007

x) Xanthosine monophosphate is an intermediate during de novo synthesis of

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

xi) Mitochondrial membrane is permeable to _____ chain fatty acids.

a) short b) medium c) long d) all of these

xii) Cyanide inhibits electron transport chain at the site

a) NAD b) Cytochrome

c) Coenzyme Q d) Iron-sulphur proteins

xiii) Gluconeogenesis is decreased by

a) Glucagon b) Epinephrine

c) Glucocorticoids d) Insulin

xiv) Glucose 6-phosphate and glucose 1-phosphate can be interconvert by

a) Glucose phosphate isomerase b) Phosphoglucomutase

c) Phosphohexose isomerase d) Glucose phosphate racemase

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

a) Define glycolysis. Give its general reaction.

b) Explain lactic acid fermentation.

c) Draw neat labelled diagram of ultrastructure of mitochondria.

d) Define glycogenic amino acids ? Give one example.

e) What are the sources of atoms in purine structure ?

f) Write a note on hydrolysis of triacylglycerol.

g) Draw the structure of cholesterol.

h) Define uncoupler. Give an example.

i) What is photosynthesis ? Give its general reaction.

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

   a) Write a note on regulation of glycolysis.

   b) Discuss the non-cyclic photophosphorylation in photosynthesis.

   c) Illustrate the regulation of purine metabolism.

   B) Explain in detail the regulation of cholesterol metabolism. **4**

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

   a) Discuss the β -oxidation of fatty acids. Add a note on ATP yield from palmitic acid.

   b) Explain in detail urea cycle.

   c) Explain in detail C_3 cycle of photosynthesis.

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

   a) Describe the transport of reducing potential from cytosole to mitochondria. **14**

   b) Discuss the reactions of glycogenesis and glycogenolysis.

   c) Explain in detail the electron transfer in chain in respiration.

SLR-X – 29

Seat No.	

B.Sc. – II (Semester – IV) (Old) (Biotechnology) Examination, 2016
MOLECULAR BIOLOGY
Molecular Biology of Gene

Day and Date : Saturday, 16-4-2016 Max. Marks : 50
Time : 10.30 a.m. to 12.30 p.m.

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

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

1) DNA differs from RNA in _____
   a) Nature of sugar alone
   b) Nature of purine alone
   c) Nature of pyrimidine and sugar
   d) All of these

2) Promoters are _____ rich DNA sequences.
   a) A = T
   b) G ≡ C
   c) A = U
   d) None of these

3) Initiation codon of protein synthesis in eukaryotes is _____
   a) GUA b) GCA c) CCA d) AUG

4) DNA duplication is also known as _____
   a) Replication
   b) Transcription
   c) Transduction
   d) Translation

5) Isotopes used in proving semi-conservative mode of replication of DNA were _____
   a) ^{14}N, ^{14}C
   b) ^{14}C, ^{31}P
   c) ^{14}N, ^{15}N
   d) ^{14}N, ^{31}P

P.T.O.

6) A nitrogenous base together with deoxyribose sugar and phosphate group forms _____

a) Nucleoside b) Nucleotide

c) Amino acid d) Polypeptide

7) DNA polymerase is needed for _____

a) Synthesis of RNA b) Replication of RNA

c) To join molecules of DNA d) Replication of DNA

8) There are several proteins that help to open up DNA double helix infront of the replication fork. These belongs to the category of _____ in eukaryotes.

a) DNA topoisomerases b) DNA polymerase I

c) DNA gyrase d) DNA unwindase or ligase

9) Number of base pairs in each turn of B-DNA helix is _____

a) 10 b) 11

c) 12 d) Variable

10) In DNA replication, the leading strand is the one which replicates in _____

a) $5' \rightarrow 3'$ direction continuously b) $3' \rightarrow 5'$ direction continuously

c) $5' \rightarrow 3'$ direction discontinuously d) $3' \rightarrow 5'$ direction discontinuously

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

1) Write a note on Telomerase.

2) Describe D-loop (mitochondrial) replication model.

3) What are Ligases ?

4) Give the salient features of Z-DNA.

5) What is central dogma ?

6) What is leading and lagging strand ?

3. A) Answer the following (**any 2**) : **6**

   1) What is genetic code ? Describe its properties.

   2) Describe the chloroplast DNA structure.

   3) Describe the photoreactivation repair of DNA.

   B) Describe briefly the experiment performed by Meselson and Stahl to show that DNA replication is semiconservative. **4**

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

   1) Describe the process of DNA replication in prokaryotes.

   2) Describe the structure of B-DNA.

   3) Describe the SOS repair mechanism and add a note on its disorders.

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

   1) Describe the rolling circle model of replication.

   2) Describe the process of DNA replication in eukaryotes.

   3) What is DNA replication ? Describe various enzymes involved in it and add a note on their functions.

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SLR-X – 30

Seat No.	

B.Sc. – II (Biotechnology) (Semester – IV) (Old) Examination, 2016
MOLECULAR BIOLOGY
Gene Regulation

Day and Date : Monday, 18-4-2016 Max. Marks : 50

Time : 10.30 a.m. to 12.30 p.m.

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

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

   1) In eukaryotes, tRNA molecule is synthesized by
      a) RNA polymerase – I b) RNA polymerase – II
      c) RNA polymerase – III d) RNA primase

   2) _____ protein play important role in extrinsic termination process in prokaryotic transcription process.
      a) Sigma factor b) Rho protein c) Core enzyme d) Translocase

   3) During splicing mechanism, introns are removed by _____ rule.
      a) GU-AG b) AG-GU c) AU-GU d) CA-GU

   4) In polyadenylation process _____ is responsible for poly-A tail formation.
      a) RNA polymerase – I b) Poly 'A' polymerase
      c) RNA polymerase – II d) DNA polymerase – III

   5) During translation process, peptide bond formation takes place with the help of
      a) Poly-A polymerase b) RNA synthetase
      c) Peptidyl transferase d) Aminoacyl-tRNA-synthetase

   6) _____ is responsible for termination of translation process.
      a) Initiation factors b) Elongation factors
      c) Release factors d) Transcription factors

P.T.O.

7) In lac operon, repressor protein binds to _____ sequences.
   a) Promotor b) Operator c) Enhancer d) Terminator

8) Operon model was proposed by
   a) Watson and Crick b) Wobble and H.G. Khorona
   c) Jacob and Monod d) Singer and Nicholson

9) In eukaryotes, enhancer sequences providing binding site for
   a) Promotors b) Transcription factors
   c) RNA polymerase d) Activators

10) _____ is known as initiator tRNA molecule in prokaryotes.
   a) $tRNA^{met}$ b) $tRNA^{val}$ c) $tRNA^{tval}$ d) $tRNA^{tmet}$

2. Answer **any five** of the following : **10**
   1) RNA polymerase in prokaryotes.
   2) Split genes.
   3) Inhibitors of protein synthesis.
   4) Charging of tRNA.
   5) Operon concept.
   6) Transcriptional repressors.

3. A) Answer the following (**any 2**) : **6**
   1) Termination of transcription in prokaryotes.
   2) RNA processing in eukaryotes.
   3) Initiation of translation in eukaryotes.

   B) Regulation of operon trp operon. **4**

4. Answer **any two** of the following : **10**
   1) Describe mechanism of translation in prokaryotes.
   2) Describe process of transcription in prokaryotes.
   3) Explain regulation of operon in lac operon.

5. Answer **any two** of the following : **10**
   1) Explain transcriptional regulation in eukaryotes with suitable example.
   2) Describe regulation of translation with suitable example.
   3) Describe structure and assembly of ribosomes in prokaryotes and eukaryotes.

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SLR-X – 31

Seat No.	

B.Sc. – II (Biotechnology) (Semester – IV) (Old) Examination, 2016
Tissue Techniques
PLANT TISSUE CULTURE

Day and Date : Wednesday, 20-4-2016 Max. Marks : 50
Time : 10.30 a.m. to 12.30 p.m.

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

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

1) _____ medium is used for callus culture.
   a) Murashige and skoog b) Nagata and takebe
   c) White d) Nitsch

2) Auxin is synthesized at _____ region.
   a) shoot apex b) root c) branches d) internode

3) In the autoclave _____ pressure is maintained at 121°C temperature.
   a) 15 lbs b) 15 min c) 15 N d) 15°F

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

5) The fusion of nucleated cell with enucleated cell leads to form
   a) chromosome b) cybrid
   c) hybrid d) symmetric hybrid

6) _____ is father of tissue culture.
   a) Hanning b) Skoog c) Haberlandt d) Pfizer

7) The shoot tip culture is used to prepare _____ plants.
   a) protein free b) vitamin free c) virus free d) chromosome

P.T.O.

8) The cell without cell wall is called
   a) Germplasm b) Chromosome c) Protoplast d) DNA

9) _____ is the most commonly used as solidifying agent in media.
   a) Auxins b) Agar c) Sodium d) Antibiotic

10) _____ is the variations occur in plants during plant tissue culture.
   a) Somatic hybrid b) Cybrid
   c) Somaclonal variation d) Callus

2. Answer the following (**any 5**) : **10**
   1) Define suspension culture.
   2) What is an explants ?
   3) What are the methods of sterilization ?
   4) Define organogenesis.
   5) Define gametoclonal variation.
   6) Define totipotency.

3. A) Answer the following (**any 2**) : **6**
   1) Write a note on isolation of protoplast by enzymatic method.
   2) Write a note on milestones in plant tissue culture.
   3) Write a note on Laminar Air Flow.

   B) Write a detailed account on artificial seed synthesis. **4**

4. Answer **any two** of the following : **10**
   1) Give detail account on infrastructure of plant tissue culture laboratory.
   2) Write a note on organ culture with suitable example.
   3) Explain in detail callus culture.

5. Answer **any two** of the following : **10**
   1) Give detail account on somatic hybridization.
   2) Write general account on somaclonal variation.
   3) Give a detail account on applications of plant tissue culture.

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SLR-X – 32

Seat No.	

B.Sc. Semester – IV (Old) Examination, 2016
BIOTECHNOLOGY
Tissue Techniques
Animal Tissue Culture

Day and Date : Thursday, 21-4-2016 Max. Marks : 50

Time : 10.30 a.m. to 12.30 p.m.

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

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

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

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

1) Laminar air flow platform sterilized by using

a) 70% ethanol b) 100% ethanol

c) 50% ethanol d) 30% ethanol

2) In _____ year carrel designed suitable flask for routine animal cell culture.

a) 1915 b) 1923

c) 1925 d) 1924

3) Which of the following material used for treatment of substrate surface ?

a) Albumin b) Transferrin

c) Collagen d) Casein

4) For maintenance of avian (bird) cell culture _____ temperature is required.

a) 37°C b) – 20°C

c) 28.5°C d) 38.5°C

5) Isolation of specific cell from tissue for culture is carried out by _____ method.

a) Disaggregation b) Heat shock

c) Centrifugation d) Radiation

P.T.O.

6) _____ is a chemical method used to get all the cells in same phase of growth in culture.

a) Electrophoresis b) Metabolic Inhibitor

c) GLC d) Centrifugation

7) Isolation of lymphocyte from blood is carried out by using

a) EMEM b) PBS

c) Ficol Hypaque d) DMEM

8) Cell death by a biologically controlled intracellular process involving DNA cleavage and nuclear fragmentation is known as

a) Inactivation of cells b) Cell lysis

c) Necrosis d) Apoptosis

9) _____ is one of the best traditional method used for distinguishing among species.

a) Karyotyping b) Apoptosis

c) Senescence d) Cloning

10) In primary culture, cell divide to give same type of cells by _____ process.

a) Cultivation b) Proliferation

c) Initiation d) Differentiation

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

1) Inlist the physiological media components.

2) Describe in brief centrifuge.

3) Expalin in brief animal cell line.

4) Define senescence.

5) Explain in brief cell repositories.

6) Write a note on sterilization of glasswares.

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

   1) Write a note on identification of specific cell lines.

   2) Write a note on application of cell culture in transplantation.

   3) Explain in brief biological fluid as natural media.

   B) Discuss instruments used in ATC. **4**

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

   1) Give details of production of monoclonal antibodies.

   2) Describe physiological properties of media.

   3) Explain measurement of apoptosis.

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

   1) Discuss in detail characteristics of cultured cells.

   2) Describe initiation of cell culture.

   3) Give details of components of serum.

SLR-X – 33

Seat No.	

B.Sc. – II (Biotechnology) (Semester – IV) (Old) Examination, 2016
METABOLISM
Bioenergetics and Enzymology

Day and Date : Friday, 22-4-2016 Max. Marks : 50
Time : 10.30 a.m. to 12.30 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 the most correct answer from given options : **10**

1) A measure of disorder of a thermodynamic system is _____
   a) Joules b) Kilojoules c) Enthalpy d) Entropy

2) Atoms or groups of atoms with an odd number of electrons which are formed on oxygen interactions are called _____
   a) Free radicals b) Anions
   c) Zwitterions d) Cations

3) The kinase enzymes belong to the class of _____
   a) Oxidoreductases b) Transferases
   c) Lyases d) Ligases

4) The protein part of a conjugated enzyme is called _____
   a) Holoenzyme b) Cofactor
   c) Prosthetic group d) Apoenzyme

5) The energy available to perform work is called as _____ of a system.
   a) Enthalpy b) Entropy
   c) Free energy d) Activation energy

6) The standard reduction potential is defined with reference to standard _____ electrode.
   a) Hydrogen b) Oxygen c) Calomel d) Silver

7) Lactate dehydrogenase enzyme has _____ isoenzyme forms.
   a) 3 b) 4 c) 5 d) 6

P.T.O.

8) Lineweaver Burk plot is the graph of _____

a) $\frac{1}{V}$ Vs $\frac{1}{[S]}$ b) V_0 Vs $\frac{1}{[S]}$

c) $\frac{[S]}{V}$ Vs [S] d) $\frac{1}{V_0}$ Vs [S]

9) _____ inhibition occurs due to binding of inhibitor to the enzyme-substrate complex.

a) Irreversible b) Competitive

c) Non-competitive d) Uncompetive

10) Ribozymes are the catalytic _____ molecules.

a) DNA b) RNA c) Ribosome d) Riboflavin

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

1) Define entropy and state the second law of thermodynamics.
2) What is Claisen condensation ? Give one example.
3) What is activation energy ?
4) State the relation between standard redox potential and standard free energy change.
5) Draw the chemical structure of ATP.
6) What is cofactor ? Give an example.

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

1) What is active site of enzyme ? State its features.
2) Write about group transfer molecules.
3) Write about common biochemical reactions.

B) Write a note on Redox potential measurement. **4**

4. Answer **any two** : **10**

1) Derive Michaelis-Menten equation. Write the significance of K_m.
2) Write a note on regulation of enzymes in living system.
3) Discuss biological oxidation-reduction reactions.

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

1) Write a note on factors affecting enzyme activity.
2) Explain different types of enzyme inhibition.
3) Discuss the free energy concept and explain how it is determined.

SLR-X – 34

Seat No.	

B.Sc. – II (Biotechnology) (Semester – IV) (Old) Examination, 2016
METABOLISM

Day and Date : Saturday, 23-4-2016 Max. Marks : 50

Time : 10.30 a.m.to 12.30 p.m.

Instructions : *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) Plastocyanin is a mobile electron carrier between

a) PS – II and cytochrome bf complex

b) PS – I and cytochrome bf complex

c) PS – I and ferredoxin

d) Oxygen evolving complex and ferredoxin

2) The herbicide Dichlorophenyl Dimethyl Urea (DCMU) kills the plant by

a) inhibition of respiration

b) destroying chloroplast

c) inhibiting flow of electrons from water to $NADP^+$

d) inhibiting PS – I and photolysis of water

3) _____ is not an intermediate of the citric acid cycle.

a) Acetoacetate b) Citrate c) Succinyl CoA d) α Ketoglutarate

4) The process of conversion of glucose to pyruvate is called

a) gluconeogenesis b) glycolysis

c) glycogenolysis d) fermentation

5) Beta oxidation of fatty acids is inhabited by increased concentration of
   a) Long chain fatty acids b) Malonyl CoA
   c) ATP d) Citrate

6) _____ is the source of nitrogen for amino acid biosynthesis.
   a) Ammonia b) Nitrogen oxide
   c) Nitric acid d) Carnitine

7) _____ is a purine nucleoside.
   a) Cytidine b) Uridine c) Thymidine d) Adenosine

8) Regulation of fatty acid biosynthesis occurs by _____ catalyzed reaction.
   a) Carnitine acyl transferase – I b) Acetyl CoA carboxylase
   c) Pyruvate carboxylase d) Citrate-malate translocase

9) _____ is not an inhibitor of electron transport chain.
   a) Rotenone b) Amobarbital c) Coenzyme Q d) Piericidin A

10) Lactic acid fermentation takes place in _____ conditions.
   a) Aerobic b) Anaerobic c) Facultative d) Shaking

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

1) Describe the components of pyruvate dehydrogenase complex.
2) What is the significance of pentose phosphate pathway ?
3) Differentiate between C_3 and C_4 pathway of CO_2 fixation.
4) What are the components of respiratory chain ?
5) Write the net reaction of palmitic acid oxidation.
6) Give an outline of amino acid biosynthesis.

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

1) Describe the regulation of glycolysis.
2) Write about non-cyclic photophosphorylation.
3) Describe the ATP synthetase complex.

B) Describe gluconeogenesis and state its regulation. **4**

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

   1) Write an account on cholesterol biosynthesis.

   2) Describe in detail the pentose phosphate pathway.

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

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

   1) Describe the biosynthesis of purine nucleotides and pyrimidine nucleotides.

   2) Discuss the TCA cycle and its regulation.

   3) Describe deamination reaction and add a note on urea cycle.

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SLR-X – 35

Seat No.	

B.Sc. – III (Biotechnology) (Semester – V) (New) Examination, 2016
ENGLISH (Compulsory)
Break Through

Day and Date : Wednesday, 30-3-2016 Max. Marks : 50
Time : 2.30 p.m. to 4.30 p.m.

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

1. A) Choose the correct alternative : **6**

1) Which of the following statements about the average parson is not true ?
   a) He teaches deference to the merely rich
   b) He is the alley of the squire
   c) He teaches honesty and equality
   d) He is a hypocrite

2) According to G. B. Shaw, people get their opinions so largely from
   a) The meditation they do b) The discussion they hold
   c) The rich people they meet d) The newspapers they read

3) One of the devices women writers resorted in order to conceal their identity was
   a) To sign their names as 'Pericles'
   b) To adopt a male name
   c) To adopt a false female name
   d) To sign their work as 'Anon'

4) Abraham Lincoln believes that the world can never forget
   a) what the brave men did at Gettysburg
   b) what the rich people did for the poor
   c) what he did for the American people
   d) what the government did for the capitalists

5) The flower mentioned in the poem "*Abou Ben Adhem"* is
   a) Rose b) Lily c) Jasmine d) Lotus

6) The poem "O Captain! My Captain!" is
   a) a sonnet b) a lyric c) an elegy d) a ballad

B) Rewrite the following sentences choosing the correct modal auxiliary from the brackets. **2**

1) _____ I park my car here ? (Will, Must, May, Would)
2) _____ I make a cup of coffee for you ? (Would, Must, Might, Shall)

C) Write the following sentences in indirect speech. **2**

1) Sachin said to me, "What is the price of this shirt?"
2) The doctor said us, "Don't eat fruits and vegetables without washing them."

2. Answer **any five** of the following questions in brief : **10**

1) How do the newspapers, according to G. B. Shaw, conspire to indoctrinate the masses into following the agenda of a few rich people ?
2) Why were Abraham Lincoln and the American people gathered at the battle field of Gettysburg ?
3) Why do so many women writers choose to remain anonymous ?
4) What are the immaterial conditions of life that hinder women's talents as writers ?
5) What did Abraham Lincoln expect from his people ?
6) What does G. B. Shaw say about religion ?

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

1) What is the theme of the poem *Abou Ben Adhem* ?
2) Why does the poet ask the Captain the rise up ?
3) Why the captain in the poem is also called the 'father' ?

B) Write short reports on **any two** of the following : **4**

1) The inaugural function of Literary Association of your college.
2) The Prime Minister's visit to China.
3) Your visit to a drought prone area in Marathwada.

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

1) Prepare a presentation consisting of five charts or slides to promote a "Dish Washer" in the market.
2) Write a presentation on the topic "Corruption in Higher Education" using charts, transparencies or slides.

5. Write a transcript of group discussion on the topic "Assassinations of modern thinkers in Maharashtra." **10**

SLR-X – 36

Seat No.	

B.Sc. – III (Sem. – V) (New) Examination, 2016
BIOTECHNOLOGY
Plant Development

Day and Date : Thursday, 31-3-2016 Max. Marks : 50

Time : 2.30 p.m. to 4.30 p.m.

1. Multiple choice question : **10**

1) Which of the following layer of anther wall has a great physiological significance in the development of pollen grain ?

a) Epidermis b) Endothecium c) Middle layer d) Tapetum

2) _____ is a condition in which the stigma matures first and loses its receptivity by the time the anthers shed their pollens.

a) Protogyny b) Protoandry c) Herkogamy d) Heterostyly

3) The flowers which open normally are called

a) Cleistogamous flower b) Deistogamous flower

c) Chasmogamous flower d) All of these

4) _____ is the albuminous seed.

a) Gram b) Pea c) Bean d) Castor

5) Polyembryony was first time found by

a) Avery b) Arber

c) Antony Van Leewenhoek d) Nawaschin

6) The embryo evolved in culture medium are known as

a) Adventitious embryos b) Somatic embryo

c) Embryoids d) All of these

7) Arabidopsis thaliana is a member of _____ Family.

a) Brassicaceae b) Arabidopsis

c) Asteraceae d) Bignoniaceae

8) Genome size of Arabidopsis thaliana is
   a) 135 bp b) 3 Mbp c) 140 bp d) 135 Mbp

9) Pectin which is present in plant cell wall is
   a) Protein b) Lipid c) Carbohydrate d) None of these

10) Indole-3-Acetic Acid (IAA) is derived from
   a) Glycine b) Tryptophan c) Histidine d) Aspartic acid

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

1) Define pollination and give its types.
2) What is meant by Pollen embryo ?
3) What are the difference between monocot and dicot plants ?
4) Define Apomixis and give its types.
5) Why Arabidopsis thaliana is used as model plant ?
6) What are the practical application of ethylene ?
7) What are the functions of stomata ?

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

1) Pollen-Pistil interaction.
2) Cell wall development in Plants.
3) What are the different mode of entry of pollen tube into ovule ?

B) Short note on flower patterning. **4**

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

1) Development of male gametophyte.
2) Explain the development of embryo development in monocot plant.
3) Give general account on auxin with its practical application.

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

1) Short note self-incompatibility.
2) Describe the endosperm formation with its type.
3) Explain the leaf development in plants.

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SLR-X – 37

Seat No.	

B.Sc. – III (Semester – V) (New) Examination, 2016
BIOTECHNOLOGY
(Animal Development)

Day and Date : Friday, 1-4-2016 Max. Marks : 50

Time : 2.30 p.m. to 4.30 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) _____ is not a property of cancer cell.
   a) Uncontrolled cell division b) Contact inhibition
   c) Self supplement of growth factors d) Metastasis

2) Amphioxus egg is
   a) Alecithal b) Centrolecithal
   c) Microlecithal d) Telolecithal

3) _____ theory was proposed by Roux.
   a) Mosaic b) Regulative
   c) Germplasm d) Gradient

4) Gradient theory was proposed by
   a) Weismann b) Child
   c) Spemann d) Roux

5) Testosterone is secreted by _____ cells.
   a) Sertoli b) Spermatogonial
   c) Primordial germ d) Intertitial

6) Amphibian egg cleaves through _____ type of cleavage.
   a) Superficial meroblastic b) Unequal holoblastic
   c) Equal meroblastic d) Discoidal meroblastic

7) Cavity present inside the amphibian gastrula is called
   a) Blastocoel b) Subgerminal cavity
   c) Segmentation cavity d) Archenteron

P.T.O.

8) Blastula of chick is called as
   a) Coeloblastula b) Pseudoblastula
   c) Discoblastula d) True blastula

9) _____ plane of cleavage pass slightly away from the equator of the egg.
   a) Vertical b) Lattitudinal
   c) Equatorial d) Meridional

10) _____hormone play important role during metamorphosis.
   a) FSH b) LH
   c) Thyroxin d) Growth

2. Answer the following (**any 5**) : **10**
   i) Organizers theory of Spemann.
   ii) Semination.
   iii) Oogenesis in insects.
   iv) Influence of yolk on cleavage.
   v) Invagination.
   vi) Aging.

3. A) Answer the following (**any 2**) : **6**
   i) Explain process of spermiogenesis in mammals.
   ii) Describe patterns of cleavage.
   iii) Describe in detail parthenogenesis.

   B) Describe blastulation in microlecithal egg. **4**

4. Answer **any two** of the following : **10**
   i) Explain in detail regulative and epigenesist theory.
   ii) Describe the structure of typical egg.
   iii) Describe post-fertilization changes in egg cytoplasm.

5. Answer **any two** of the following : **10**
   i) Describe process of gastrulation and a note on gene activation.
   ii) Explain process of fertilization.
   iii) Describe regeneration in microbes and vertebrates.

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SLR-X – 38

Seat No.	

B.Sc. (Part – III) (Biotechnology) (Semester – V) (New) Examination, 2016
BIOINFORMATICS AND NANOTECHNOLOGY

Day and Date : Saturday, 2-4-2016 Max. Marks : 50
Time : 2.30 p.m. to 4.30 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) OWL is _____ database.
a) Redundant b) Unverified c) Unannotated d) Composite

2) The structural database of nucleic acid is _____
a) PDB b) NRL-3D c) GenBank d) NDB

3) Sanger Centre, HGMP-RC, EBI is hosted by _____
a) Hinxton Hall b) MIPS c) UCL d) NCBI

4) The protein sequence database is _____
a) GenBank b) EMBL c) DDBJ d) SWISS-PROT

5) _____ refers to the process of identifying the regions of genomic DNA of *E. Coli* that encode genes.
a) Gene prediction b) Eukaryotic gene prediction
c) Prokaryotic gene prediction d) Gene search

6) _____ is a tool to imagine nano-scale behaviors.
a) NanoCAD b) NanoRAM c) NanoROM d) NanoUSB

7) To obtain the thin films without changing the composition of original material, the _____ technique is used.
a) Laser ablation b) Sputter deposition
c) Electric arc discharge d) Electrochemical etching

8) One nanometer is the _____ part of a meter.
a) Thousandth b) Millionth c) Billionth d) Trillionth

P.T.O.

9) The uncertaincy principle about position and momentum of particles was proposed by _____

a) Robert Brown b) Schrödinger c) Heisenberg d) Max Planck

10) In _____ approach, the atoms and molecules are removed from a bulk material or sometimes thin films so as to obtain desired nanostructure.

a) Top down b) Bottom up c) Traditional d) Modern

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

1) What is SRS ?

2) What is NRL-3D ?

3) What is ESTs and GSTs ?

4) Which techniques are used for synthesis of nanomaterials by physical methods ?

5) What are different sizes of matter ? How much is a nano size ?

6) Enlist different types of lithography.

7) What is quantum mechanics ?

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

1) Write a note on Entrez.

2) Explain how the growth of nanocrystals occur.

3) Explain the primary protein sequence databases.

B) Describe the role of nanomaterials in drug delivery. **4**

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

1) Explain multiple sequence alignment using Clustal X.

2) Describe different lithography techniques used to make nanostructures.

3) Add a note on quantum idea and quantum mechanics.

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

1) What is structural database ? Explain any three Protein Structural Databases.

2) What is lithography ? Describe the lithography tools used to measure nanostructures.

3) What is *in silico* ? Explain the *in silico* tools used in the analysis protein sequences.

_____

SLR-X – 39

Seat No.	

B.Sc. (Part – III) (Semester – V) (New) Examination, 2016
BIOTECHNOLOGY
Recent Trends in Biotechnology

Day and Date : Monday, 4-4-2016 Max. Marks : 50
Time : 2.30 p.m. to 4.30 p.m.

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

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

i) The _____ is the concentration estimated to produce mortality in 50% of a test population over a specific time period.

a) LD50 b) LC50 c) MC50 d) Half life

ii) _____ is a process which leads to a metabolic conversion of foreign compounds (xenobiotics) in the body.

a) Biomagnification b) Biotransformation
c) Bioanabolism d) Bioleaching

iii) _____ is the method of *Ex situ* bioremediation.

a) Biofiltration b) Bioventing c) Composting d) Bioslurping

iv) The addition of _____ is carried out in bioaugmentation.

a) organisms b) water c) nutrients d) air

v) The improvement or alteration in existing pathway in a cell is a task of

a) immbolization b) protein engineering
c) enzyme engineering d) metabolic engineering

P.T.O.

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

a) cross linking b) diazotation

c) group activation d) peptide bond

vii) Industrially important _____ produces 42% fructose, 52% glucose and 6% dextin. This mixture is sweeter than glucose and sweet as sucrose.

a) penicillinase b) lactase

c) glucose isomerase d) glucose oxidase

viii) At _____ of biochemical network, the fluxes through each pathway will be a function of the individual enzyme kinetic properties, as well as the network architecture.

a) pre-steady b) steady

c) post-steady d) both pre and post steady state

ix) _____, is (are) ethical principle (s) supported by conservational biology.

a) Biodiversity is desirable for all living things, including humans

b) Extinctions due to human actions are undesirable

c) Biodiversity has value unto itself

d) All of these

x) The standards of conduct that grow out of one's understanding of right and wrong are known as

a) ethics b) moral

c) behavior d) common sense

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

a) What is NOEL analysis ?

b) Define the terms Bioleaching and Biofiltration.

c) What are the types if toxic substances ? Give their examples.

d) Enlist any four ethical issues associated with human genome project.

e) Write a note on DL-amino acid racemase.

f) How mutational selection is used for implementing changes in metabolic engineering ?

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

   a) Discuss the humanitarian-hopes, moral debate concerning embryonic stem cell research.

   b) Write a note on solvent engineering.

   c) Distinguish between *In situ* and *Ex situ* bioremediation.

   B) Give a detail account of physical adsorption method immobilization. **4**

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

   a) Explain in brief the basic principle, problem defining and pathway synthesis involved in metabolic engineering.

   b) Discuss various routes of entry of xenobiotics in human body.

   c) Write a note on various processes of phytoremediation technology for soil decontamination.

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

   a) Describe in brief the detoxification mechanism in human body.

   b) Discuss the CCAC guidelines on animal welfare.

   c) Explain in detail the covalent bonding used in immobilization of enzyme.

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SLR-X – 42

Seat No.	

B.Sc. (Part – III) (Semester – V) (Old) Examination, 2016
BIOTECHNOLOGY
Fermentation Technology

Day and Date : Friday, 1-4-2016 Max. Marks : 50
Time : 2.30 p.m. to 4.30 p.m.

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

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

1) Stock culture is maintained by
   a) Sterilization b) Lyophilization c) Pasteurisation d) Tyndallisation

2) Sulphite Waste liquor is the waste of _____ industries.
   a) Oil b) Paper and pulp
   c) Dairy d) None of these

3) Microbial inhibition spectrum of antibiotic is determined by
   a) SPC b) Crowded plate c) Indicator d) Giant colony

4) _____ technique is used for selection of auxotrophic mutants.
   a) Penicillin b) Alcohol c) Acid d) None of these

5) Laboratory scale fermentor having _____ liters capacity.
   a) 100-500 b) 1-2 c) 1,00,000 d) None of these

6) Cell population is maintained in steady state in _____ culture.
   a) Batch b) Fed batch c) Continuous d) All of these

7) Industrial production of citric acid is carried out by using _____ microorganism.
   a) *Saccharomyces cerevisiae* b) *Escherichia coli*
   c) *Aspergillus niger* d) *Acetobacter suboxydane*

8) _____ of the following is not used as antifoaming agent.
   a) Lard oil b) Silicon derivatives
   c) Vegetable oils d) Citric acid

P.T.O.

9) Solvent extraction is used for recovery of
   a) Amylase b) Penicillin c) Alcohol d) Citric acid

10) _____ production is example of dual fermentation.
   a) Vinegar b) Alcohol c) Beer d) None of these

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

1) Give raw material used for fermentation media formulation.
2) Define primary and secondary screening.
3) Give methods used for strain improvement.
4) Give applications of citric acid.
5) Define scale up.
6) Give names of microorganisms in industrial production of amylases.

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

1) Write down the characteristics of an ideal fermentation media.
2) Describe in detail the inoculum preparation.
3) Aeration and Agitation.

B) Write an essay on Bioinsecticide Production. **4**

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

1) Explain in detail Microbial growth kinetics in batch culture.
2) Application of computer in fermentation technology.
3) Write an account on different methods of filteration used for purification of fermented broth.

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

1) Explain different Biological assay methods.
2) Explain primary screening.
3) Give an account on fermentation economics.

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SLR-X – 43

Seat No.	

B.Sc. – III (Semester – V) Examination, 2016
BIOTECHNOLOGY
Plant Development (Old)

Day and Date : Saturday, 2-4-2016 Max. Marks : 50
Time : 2.30 p.m. to 4.30 p.m.

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

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

1) _____ % of protein is present in the structure of TMV.
a) 5% b) 95% c) 90% d) 10%

2) _____ is precursor of Indole Acetic Acid (IAA).
a) Tyrosine b) Leucine c) Phenylalanine d) Tryptophan

3) The term biodiversity was coined by _____
a) E. P. Odum b) R. Reiter c) J. Reinert d) Skoog

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

5) Protoplast can be made to fuse in the presence of electric current by _____
a) Chemical method b) Enzymatic method
c) Electrofusion method d) Spontaneous method

6) Biodiversity
a) Increases towards the equator
b) Decreases towards the equator
c) Remains same throughout the planet
d) Has no effect on change in latitude

7) In higher plants cell enlargement is due to hormone _____
a) Auxin b) Florigen c) Cytokinin d) Gibberellin

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

9) Endemic species are _____
   a) Rare species b) Species localized in a specific region
   c) Cosmopolitan in distribution d) Critically endangered species

10) The study of flower patterning is carried out by _____ model.
   a) ABC b) BCD c) XYZ d) CDF

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

1) Define flower.
2) Define phytoharmones.
3) Define virus.
4) What is biodiversity ?
5) What is protoplast culture ?
6) Define photoperiodism.

3. A) Answer the following **(any 2)** : **6**

1) Write a note on Monocot embryo.
2) Write applications of somatic embryogenesis.
3) Explain the old classification system of viruses.

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

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

1) Explain the male gametophyte development in angiosperm.
2) Give detail account on *Arabidopsis Thaliana* as model of plant development.
3) Write an essay on TMV.

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

1) Write a note on seed vernalization in plants.
2) Write general account on Auxin.
3) Give a detail account on apomixes.

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Seat No.	

B.Sc. III (Biotechnology) (Semester – VI) Examination, 2016
ENGLISH (Compulsory) (New)
Breakthrough

Day and Date : Tuesday, 22-3-2016 Max. Marks : 50
Time : 10.30 a.m. to 12.30 p.m.

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

1. Choose the correct alternative : **10**

1) The action of the story whitewashing the fence takes place on _____ morning.
   a) Monday b) Saturday c) Sunday d) Friday

2) The work that had always been hateful in Tom's eyes was
   a) bringing oil from the shop
   b) whitewashing the feuce
   c) painting pictures
   d) bringing water from town pump

3) The price of the necklace that mathilde lost was
   a) Forty Francs
   b) Thirty-six francs
   c) Five hundred francs
   d) Thirty-six thousand francs

4) Pyramus and Thisbe belong to
   a) Babylonia b) Somalia c) Syria d) Romania

5) The poem 'In the Bazaars of Hydrabad' is
   a) a lyric b) a sonnet c) an elegy d) an ode

6) _____ is referred to as an auspicious queen in the poem 'On Virtue'.
   a) Virtue b) Wisdom c) Chastity d) Glory

7) The tag question for the sentence "Somebody left the book on the table" is
   a) did they ? b) did he ?
   c) didn't he ? d) didn't they ?

P.T.O.

8) The sentence "It was raining, yet we went shopping" is a
   a) simple sentence b) complex sentence
   c) compound sentence d) None of the above

9) "The man 'whom I met yesterday was a musician". The underlined clause is
   a) a noun clause
   b) a relative clause
   c) an adverbial clause
   d) a prepositional clause

10) The sentence "Does Kiran play the Sitar"? is
   a) a yes/no question
   b) a WH question
   c) a rhetorical question
   d) an imperative sentence

2. Answer **any five** of the following questions in short : **10**
   1) Why was Mathilde unhappy ?
   2) How did Loisel and Mathilde replace the necklace ?
   3) How did Tom persuade Jim to help with his task ?
   4) What was Tom's great magnificient inspiration ?
   5) Why did Pyramus and Thisbe kill themselves ?
   6) What message does Thomas Bulfinch convey through the story pyramus and thisbe ?

3. A) Answer **any two** of the following : **6**
   1) How is Wisdom described in On Virtue ?
   2) What are the merchants selling in the Bazaars of Hydrabad ?
   3) What kind of music is being played in the Bazaars of Hydrabad ?

   B) Answer **any two** of the following : **4**
   1) Write the important tips on time management.
   2) Imagine you have failed the V semester of compulsory English paper. How will you manage stress and overcome the failure ?
   3) Your sister has lost her laptop in her classroom. She is under depreciation. How will you help your sister to solve the problem ?

4. A) You travelled to Mumbai for attending an interview. During the journey by train you were introduced to a fellow passenger coming from Pune. Describe the person you met during this journey by throwing light on his personality traits. **10**

OR

B) Write a description of a national hockey-player you watched at an interview programme on T.V. conducted by the TV anchor, by describing his personal qualities, attitudes, speech etc.

5. Read the following passage and write one-third summary of it. **10**

Trees give shade for the benefits of others and while they themselves stand in the sun and endure scorching heat, they produce the fruit by which others profit. The character of good men is like that of trees. What is the use of this perishable body, if no use of it is made for the benefit of mankind ? Sandalwood – the more it is rubbed the more scent does it yield. Sugarcane – the more it is peeled and cut into pieces, the more juice does it produce. Gold – the more it is burnt, the more brightly does it shine. The men who are noble at heart do not lose these qualities even in losing their lives. What does it matter whether men praises them or not ? What difference does it make whether riches abide with them or not ? What does it signify whether they die at this moment or whether their lives prolonged ? Happen what may, those who tread in the right path will not set foot in any other. Life itself is unprofitable to a man who does not live for others. To live for the mere shake of living one's life is to live the life of dogs and cows. Those who lay down their lives for the shake of a friend or even for the sake of a stranger, will assuredly dwell forever in a world of bliss.

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Seat No.	

B.Sc. – III (Semester – VI) Examination, 2016
BIOTECHNOLOGY (New) (Paper – I)
Genetic Engineering : Tools and Techniques

Day and Date : Wednesday, 23-3-2016 Max. Marks : 50
Time : 10.30 a.m. to 12.30 p.m.

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

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

1) _____ enzymes cleave the DNA at regions that are specific for each enzyme.
   a) DNA modifying b) Restriction
   c) Ligase d) Reverse transcriptase

2) _____ is the region where DNA replication is initiated.
   a) tra b) colE1 c) Ori d) nif

3) SV40 DNA viruses belong to the _____ family.
   a) Simian virus b) Salmonella
   c) Adenovirus d) Papova virus

4) A _____ is a short or long length of ssRNA or DNA.
   a) Nucleic acid b) Isotope c) cDNA d) Probe

5) A rapid method of amplifying a length of target DNA is by _____
   a) PCR b) Transformation
   c) Labeling d) Transfection

6) pBR322 is a _____
   a) Cosmid b) Natural plasmid
   c) Constructed plasmid d) Phagemid

7) The Crown Gall disease caused in plants is due to _____
   a) *Archaebacteria* b) A virus
   c) *A.rhizogenes* d) *A.tumefacians*

8) In blotting techniques nucleic acids are transferred to the _____ membrane.
   a) Cell b) Cellulose
   c) Nitrocellulose d) None of these

9) The region of Ti plasmid that is responsible for tumor formation is known as _____
   a) T DNA b) R DNA c) C DNA d) DNA

10) _____ enzyme introduces nicks in nick translation in a duplex DNA molecule.
   a) DNA ligase b) DNA polymerase I
   c) DNAse I d) DNA polymerase III

2. Answer **any five** of the following : **10**
   i) What is chromosome walking ?
   ii) Explain the method of particle bombardment.
   iii) Give the role of DNA modifying enzymes in cloning.
   iv) Draw the genome organization of plasmid pBR322.
   v) What is taq DNA polymerase ?
   vi) Explain autoradiography.

3. A) Answer **any two** of the following : **6**
   1) Enlist the names of cloning vectors with explanation.
   2) Describe the mechanism of Agrobacterium mediated gene transfer.
   3) Explain the technique of RFLP.

   B) What are cloning vectors ? Describe the Cosmids and Shuttle vectors. **4**

4. Answer **any two** of the following : **10**
   1) Describe the technique of PCR. Write its applications.
   2) How is selection of the recombinant clones done ?
   3) Write an account on sequencing of genes.

5. Answer **any two** of the following : **10**
   1) Write down the role of different enzymes in gene cloning.
   2) Describe the methods of transformation, transduction and transfection.
   3) Differentiate between agarose gel electrophoresis and PAGE.

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Seat No.	

B.Sc. – III (Semester – VI) Examination, 2016
BIOTECHNOLOGY (Paper – II)
Genetic Engineering : Applications (New)

Day and Date : Saturday, 26-3-2016 Max. Marks : 50

Time : 10.30 a.m. to 12.30 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) Lignin is made up of _____ subunits with no chains of regular repeating units.

a) Phenylpropane b) Butane

c) Propane d) Phenol

2) Microbes represents _____ Biomass of our planet.

a) 25% b) 50% c) 20% d) 10%

3) Interferon α & β are synthesized in cells that have been exposed _____

a) Bacteria b) Fungus c) Viruses d) Protozons

4) _____ began the work in direction of protein engineering in early 1954.

a) Morris Gayle b) Carrel c) Zernik d) Max Perutz

5) The composition of _____ oligonucleotide includes a single mixed oligonucleotides with ribonucleotides and deoxyribonucleotides.

a) Chimeric b) Antisense c) Fused d) Antagonist

6) The addition of _____ To animal cell reduces the expression of the gene from which double stranded RNA sequence is derived.

a) Ds DNA b) Ds RNA c) Ss DNA d) Ss RNA

7) Genetically engineered *X. Campestris* was grow on whey due to Insertion of _____ gene.

a) *Bacillus* lac ZY b) *Pseudomonas* lac ZY

c) *E. coli* lac ZY d) Fungi lac ZY

8) Subunit vaccine for cholera is prepared by _____ epitope.

a) Cholera toxin C subunit b) Cholera toxin A subunit

c) Cholera toxin D subunit d) Cholera toxin B subunit

9) Crystal shape of CRY II (subgroup) is _____

a) Cuboidal b) Bipyramidal c) Flat d) Irregular

10) _____ Portion is 3000 times sweeter than sucrose.

a) Morphin b) Monellin c) Casein d) BSA

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

1) Give brief account on plant as edible vaccine.

2) Write a short note on increase in enzyme stability.

3) Explain in brief peptide vaccines.

4) Explain antisense Oligonucleotide.

5) Write short note on chimeric RNA DNA molecule.

6) Write a note on gene therapy for cystic fibrosis.

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

1) Explain antisense RNA as therapeutic agent.

2) How will you increase enzyme activity explain with example ?

3) Explain cloning livestock by nuclear transfer.

B) Explain attenuated vaccines against viruses. **4**

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

   1) Give details of utilization of cellulose as a component of lignocellulases.

   2) Describe herbicide resistant plants.

   3) Explain in detail transgenic mice.

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

   1) Discuss insect resistant plants.

   2) Explain salt stress tolerant plants.

   3) Give details of genetic engineering of biodegradative pathway by manipulation by transfer of plasmid.

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Seat No.	

B.Sc. – III (Semester – VI) (Biotechnology) Examination, 2016
MICROBIAL BIOTECHNOLOGY : FERMENTATION TECHNOLOGY (New)
(Paper – I)

Day and Date : Monday, 28-3-2016 Max. Marks : 50

Time : 10.30 a.m. to 12.30 p.m.

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

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

i) In the fermentation process _____ prevents vortex formation.
a) antifoam agents b) baffles
c) spargers d) agitator

ii) Sulfite waste liquor is the byproduct of _____ industry.
a) paper and pulp b) sugar
c) dairy d) pharma

iii) _____ technique is used for selection of auxotrophic mutants.
a) Alcohol b) Acid c) Base d) Penicillin

iv) End point determination assay are performed for
a) growth regulators b) vitamins
c) antibiotics d) enzymes

v) In continuous culture, chemostat is a _____ self balancing culture system.
a) nutrient limiting b) pH limiting
c) temperature limiting d) recovery limiting

vi) Exponential growth in Batch culture may be prolonged by adding
a) acid to media b) base to media
c) fresh nutrient to media d) salts to media

vii) Crystallization is the best established method for recovery of
a) ethers b) alcohols
c) single cell proteins d) organic acids

P.T.O.

viii) Ethanol is purified using
a) crystallization b) distillation
c) centrifugation d) solvent extraction

ix) Phenyl acetic acid used as precursor in _____ fermentation.
a) penicillin b) vitamin B_{12} c) citric acid d) acetic acid

x) Citric acid is produced by
a) *Bacillus subtilis* b) *Fusarium moniliforme*
c) *Micrococcus glutamicus* d) *Aspergillus niger*

2. Answer **any five** of the given below : **10**
i) Define and explain agitation.
ii) What is culture collection center ? Give two examples of the same.
iii) What is anaerobic fermentation ? Give the example of the same.
iv) Explain product formulation.
v) What is precursor ? Explain with example.
vi) Explain growth kinetics with formulae.

3. A) Answer **any two** of the following : **6**
i) Explain the continuous fermentation.
ii) Explain the methodology used for recovery of Amylase.
iii) Explain any two biological assays with example.

B) Explain components of typical fermenter. **4**

4. Answer **any two** of the following : **10**
i) Explain primary screening with examples.
ii) Write an essay on Bio-insecticide production.
iii) Write briefly on strain improvement.

5. Answer **any two** of the following : **10**
i) Write an essay on ethanol fermentation.
ii) Give the note on raw materials used for media preparation.
iii) Explain various methods used for recovery of fermented products.

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Seat No.	

B.Sc. – III (Semester – VI) (Biotechnology) Examination, 2016
MICROBIAL BIOTECHNOLOGY (Paper – II)
Food and Dairy Technology (New)

Day and Date : Tuesday, 29-3-2016 Max. Marks : 50

Time : 10.30 a.m. to 12.30 p.m.

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

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

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

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

i) Most of microbes are inactivated at _____ temperature of freezing.

a) – 15°C to – 30°C b) – 4°C to – 10°C

c) 2°C to 4°C d) 5°C to 10°C

ii) Available water or water activity (a_w) is decreased using _____

a) Pasteurization b) Drying

c) Filtration d) Canning

iii) Phosphatase test is used for _____

a) Spoilage of milk

b) Preservation of milk

c) Counting of microbes in milk

d) Determination of efficiency of pasteurization

iv) Indian pickles are preserved due to _____

a) Hypertonic condition b) Hypotonic condition

c) Isotonic condition d) Isoelectric point

P.T.O.

v) _____ nutrient medium is used for MPN test.

a) Citrate broth b) MacConkey's broth

c) Nutrient broth d) Gelatin broth

vi) Quality of milk determined using _____

a) MBRT test b) Resazurin test

c) Both of these d) None of these

vii) USA Food and Drug Administration was adopted HACCP in the year _____

a) 1946 b) 1973

c) 2001 d) 2010

viii) The microbial hazards can be either prevented, eliminated or reduced to acceptable level using _____

a) Cleaning-in-Place b) Hazard Analysis

c) Critical Control Points d) None of these

ix) As per MBRT test decolourization after 8 hours indicates that milk has _____ quality.

a) Better b) Good

c) Excellent d) Poor

x) Radiation of UV at _____ nm wavelength are most germicidal.

a) 250 b) 260 c) 280 d) 300

2. Answer **any five** of the given below : **10**

i) Explain immunological method for detection of toxin in food.

ii) Explain the microbial culture collection units and give example.

iii) Explain quality control in brief.

iv) What is milk ? Give its composition.

v) What is nonperishable food ? Give its examples.

vi) What is asepsis ? Give its significance.

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

   i) Explain most probable number methodology for determination of fecal load.

   ii) Explain microbial spoilage of meat and meat products.

   iii) Explain role of equipment cleaning and disinfection in food industry.

   B) Define pasteurization and explain methods of pasteurization. **4**

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

   i) Explain the production, spoilage, preservation and nutritional value of Beer.

   ii) Explain factors affecting microbial growth with respect to food industry.

   iii) Explain dye reduction tests in detail with its significance.

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

   i) Explain the production, spoilage, preservation and nutritional value of Yoghurt.

   ii) Explain Hazard Analysis and Critical Control Points (HACCP) system in detail.

   iii) Explain microbial spoilage of vegetable and fruits.
