



3. Answer **any two** of the following : **12**
- 1) Describe the theme of the poem 'I Find No Peace'.
 - 2) Comment on the use of contrast in the poem 'Success is counted sweetest'.
 - 3) Write in detail what is communication.
 - 4) State the possible causes when you missed a lecture because you did not know that the lecture was scheduled at that particular time.
4. Answer **any one** of the following : **14**
- 1) Explain where and why e-mail, video calls, mobile phones, radio and movie these channels of – communication are used in particular communication.
 - 2) Why do you think we need language and vocabulary ?
5. What is the difference between one way and two way communication ? Write in detail. **14**
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B.Sc. – I (Semester – I) (CBCS) Examination, 2018
BIOTECHNOLOGY
Ecology and Microbiology
Paper – I : Ecology

Day and Date : Tuesday, 30-10-2018
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

1. Rewrite the sentence using correct alternative given below. 14
- 1) Ecology is study of
 - a) Only living things
 - b) Only non living things
 - c) Both living and non living things
 - d) Living things and non living things and interaction between them
 - 2) _____ is an obligatory positive interspecific interaction that is strongly beneficial.
 - a) Commensalism
 - b) Mutualism
 - c) Protocooperation
 - d) Social parasitism
 - 3) Environment is _____ word.
 - a) German
 - b) French
 - c) Latin
 - d) Spanish
 - 4) Lightning occurs in _____ zone.
 - a) Troposphere
 - b) Stratosphere
 - c) Mesosphere
 - d) Ionospheres
 - 5) The state of India with maximum percentage of its area covered by forest is
 - a) Rajasthan
 - b) Karnataka
 - c) Bihar
 - d) Madhya Pradesh
 - 6) The term ecosystem was proposed by
 - a) Carl Mobius
 - b) A.Tansley
 - c) E.Odum
 - d) E.Clement
 - 7) The final stable community in ecological succession is called as
 - a) Final community
 - b) Ultimate community
 - c) Climax community
 - d) Seral community
 - 8) The consumers feed on autotrophs are called as
 - a) Producer
 - b) Primary consumer
 - c) Secondary consumer
 - d) Carnivores
 - 9) The environmental day celebrated on
 - a) 12 March
 - b) 5 June
 - c) 10 May
 - d) 4 Jan
 - 10) Crop plant ecosystem is _____ type of ecosystem.
 - a) Natural
 - b) Artificial
 - c) Marine
 - d) Limnic



- 11) The fossils fuel is
 a) Renewable
 b) Non renewable
 c) Inexhaustible
 d) Non renewable and exhaustible
- 12) The category of primary consumer includes
 a) Eagles and Tigers
 b) Fish and whales
 c) Snakes and frogs
 d) Cattles and insect
- 13) According to Myers, 2000, the no. of hot spots in the world is
 a) 10
 b) 12
 c) 24
 d) 25
- 14) Which of them is most responsible for World water crisis ?
 a) Dam
 b) Floods
 c) Drought
 d) Population growth
2. A) Answer the following (**any four**) : 8
 1) Ecosystem.
 2) Pedogenesis.
 3) Natural resources.
 4) *In situ* conservation.
 5) Ammonification.
- B) Write notes on (**any two**) : 6
 1) Define environment and its different sphere.
 2) Define biodiversity and its importance.
 3) Define biogeochemical cycle and its types.
3. A) Answer the following (**any two**) : 8
 1) Explain in detail soil profile.
 2) Write short note on abiotic component of ecosystem.
 3) Explain carbon cycle.
- B) Answer the following (**any one**) : 6
 1) Write a note on estuarine ecosystem.
 2) Explain conservation and management of natural resources.
4. A) Answer the following (**any two**) : 10
 1) Write a detailed account on grassland ecosystem.
 2) Give an account on energy flow in ecosystem.
 3) Explain in detail phosphorus cycle.
- B) Answer the following (**any one**) : 4
 1) Write an account on Silent Valley.
 2) Write an account on Narmada Bachao Andolan.
5. Answer the following (**any two**) : 14
 1) Define atmosphere and explain in detail its structure with diagram.
 2) Describe in detail forest as natural resource.
 3) Define aquatic ecosystem and explain in detail freshwater ecosystem.



- B) Answer **any one** of the following : (6×1=6)
- 1) Write in details general characteristics, classification and cultivation of algae.
 - 2) Describe in detail structure and function of bacterial ribosome.
4. A) Answer **any two** of the following : (5×2=10)
- 1) Explain difference between prokaryotic cell and eukaryotic cell.
 - 2) Write in detail different branches of microbiology.
 - 3) Write in detail contribution of Robert Hook and Winogradsky in the microbiology.
- B) Answer **any one** of the following : (4×1=4)
- 1) Write in detail general characteristics of Mycoplasma.
 - 2) Explain difference between capsule and slime layer.
5. Answer **any two** of the following : (7×2=14)
- 1) Describe in detail distribution, beneficial and harmful activities of Microbes.
 - 2) Write an essay on structure and functions of bacterial cell wall.
 - 3) Explain in detail general characteristics of Rickettsia.
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B.Sc. I Semester – I Biotechnology (CBCS) Examination, 2018
INTRODUCTION TO BIOSCIENCES
Paper – I : Animal Sciences

Day and Date : Thursday, 1-11-2018
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. Rewrite the following sentences by choosing the correct alternative : **14**
- 1) _____ used in deep sea fishery.
 - a) Trawlers
 - b) Fishing Net
 - c) Mechanized nets
 - d) Aquarium
 - 2) Artificial cultivation of fishes is known as
 - a) Sericulture
 - b) Apiculture
 - c) Pisciculture
 - d) Lact culture
 - 3) Brain originates from
 - a) Mesoderm
 - b) Endoderm
 - c) Ectoderm
 - d) Ecto-mesoderm
 - 4) In mammals, Ureter opens into
 - a) Vestibule
 - b) Urethea
 - c) Urinary bladder
 - d) Uterus
 - 5) Structural and functional unit of testis
 - a) Seminiferous Tubule
 - b) Uriniferous Tubule
 - c) Sarcomere
 - d) Haversian System
 - 6) Rearing of earthworm for production of vermicompost is called
 - a) Apiculture
 - b) Vermiculture
 - c) Sericulture
 - d) Aquaculture



- B) Write short note on **any two** of the following : 6
- 1) Describe in short importance of Vermicompost.
 - 2) Write a detailed note on Spinal cord.
 - 3) Explain Courtship behavior in birds.
3. A) Answer **any two** of the following : 8
- 1) Explain construction and maintains of Glass Aquarium.
 - 2) Explain life cycle of tapeworm.
 - 3) Write a brief note on connective tissue.
- B) Answer **any one** of the following : 6
- 1) Add a detail note on parasite and host interaction.
 - 2) Explain in detail functions of Muscular tissue.
4. A) Answer **any two** of the following : 10
- 1) Write in brief about salivary gland.
 - 2) Describe life cycle, types and economic importance of Honey bee.
 - 3) Write a note on Camouflage with suitable example.
- B) Answer **any one** of the following : 4
- 1) Write a brief note on Naupial flight and communication.
 - 2) Define Vermiwash and explain its economic importance.
5. Answer **any two** of the following : 14
- 1) Describe life cycle of Schistosoma.
 - 2) Describe in detail structure and function of Salivary Gland.
 - 3) Give the location, structure and function of Simple Epithelial Tissue.
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B.Sc. – I Biotechnology (Semester – I) (CBCS) Examination, 2018
INTRODUCTION TO BIOSCIENCES
Paper – II : Plant Sciences

Day and Date : Friday, 2-11-2018
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

1. Multiple choice questions :

14

- 1) _____ is type of lichen where thallus is flat, horizontally spreading and leaf like.
A) Crustose B) Foliose C) Fruticose D) Filamentous
- 2) _____ tissues are present only at growing regions of shoot and root tips.
A) Simple B) Complex C) Meristematic D) Vascular
- 3) After fertilization the zygote of a seed plant becomes
A) Fruit B) Embryo C) Seed D) Ovule
- 4) Algae having oil as reserve food belongs to
A) Xanthophyceae B) Rhodophyceae
C) Chlorophyceae D) Pheophyceae
- 5) Presence of casparian strips is characteristic feature of
A) Endodermis B) Exodermis C) Epdermis D) Pericycle
- 6) A simple mechanical tissue devoid of lignin is
A) Parenchyma B) Sclerenchyma
C) Collenchyma D) Cholerenchyma
- 7) Which of the following give rise to the cork tissue ?
A) Phellogen B) Periblem C) Periderm D) Phelloderm
- 8) The exine of pollen grain is made of
A) Pectin B) Cellulose C) Sporopollenin D) Lignocellulose
- 9) Pollination which occurs in closed flower is known as
A) Allogamy B) Cleistogamy C) Autogamy D) Hydridism
- 10) Overy wall gives rise to
A) Fruit wall B) Seed coat C) Mesocarp D) Endocarp
- 11) Development of fruits without fertilization is called
A) Apospory B) Allospory C) Parthenocarp D) Polygamy
- 12) Tunica corpus theory is related with
A) Root apex B) Root cap
C) Shoot apex D) Secondary growth



- 13) _____ meristem helps in increasing plant growth.
A) Lateral meristem B) Intercalary meristem
C) Apical meristem D) Primary meristem
- 14) Liverworts are closely related to
A) Algae B) Fungi C) Lichen D) Mosses
2. A) Answer the following questions. **(any four)** : **8**
1) Define megasporogenesis.
2) Write any four morphological characters of lichen.
3) Write down the function of parenchyma.
4) What are cork cells ?
5) Give the classification of permanent tissue.
- B) Write notes on **(any two)** : **6**
1) Morphological characters of gymnosperms.
2) Functions of meristem.
3) Plants used for alcohol production.
3. A) Answer the following **(any two)** : **8**
1) Write a note on types of vascular bundle.
2) Explain seed structure in monocot plants.
3) Give general classification of plants.
- B) Answer the following **(any one)** : **6**
1) Describe internal organization of monocot stem.
2) Explain different types of meristems classified on the basis of their origin and function.
4. A) Answer the following **(any two)** : **10**
1) Write a note on normal secondary growth and annual rings.
2) Explain development of male gametophyte.
3) Describe types and functions of complex tissues.
- B) Answer the following **(any one)**. **4**
1) Write a note on origin of food crops.
2) Explain histogen theory of structural development.
5. Answer the following **(any two)** : **14**
1) Write a note on internal organization of dicot stem.
2) Explain types of pollination with advantages of each type.
3) Give the morphological characters of algae.



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B.Sc. – I (Semester – I) (CBCS) Examination, 2018
BIOTECHNOLOGY
Fundamentals of Chemistry and Biophysics
Paper – I : Chemical Sciences

Day and Date : Saturday, 3-11-2018
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. Select the most correct alternative from the following and rewrite the sentences. **14**

- 1) _____ is unit of rate constant for first order reaction.
a) min^2 b) S^{-1} c) S d) min
- 2) NaCl contains _____ bond.
a) covalent b) metallic c) ionic d) hydrogen
- 3) In sp^2 hybridization, bond angle is
a) 120° b) 60° c) 109° d) 180°
- 4) _____ is universal solvent.
a) Alcohol b) Acetone c) Water d) Ester
- 5) Positive Catalyst is _____ the rate of reaction.
a) decreases b) increases c) minimizes d) reduced
- 6) _____ orbital has square shape.
a) s b) p c) d d) f
- 7) _____ is the ratio of Molecular Wt. and Acidity/Basicity/O.S.
a) Atomic weight b) Molecular weight
c) Atomic mass no. d) Equivalent weight
- 8) _____ is polar molecule.
a) Cl_2 b) Br c) HCl d) H_2
- 9) $\text{A} + \text{B} = \text{P}$ is
a) unimolecular b) bimolecular
c) tetramolecular d) none of these



- 10) Range of pH is
a) 0 – 14 b) 1 – 14 c) 14 d) above 14
- 11) Molecularity of reaction never be
a) zero b) 3/2 c) 2 d) 3
- 12) _____ is example of colligative property.
a) mass b) volume
c) osmotic pressure d) pressure
- 13) Molality is _____ concept.
a) W/V b) W/W c) V/V d) V/W
- 14) pH value depends on _____ ion.
a) H⁺ b) OH⁻ c) Cl⁻ d) Br⁻
2. A) Answer **any four** of the following. **8**
- 1) Give any two general characteristics of ionic solids.
 - 2) What is catalyst ? Give one example.
 - 3) Define pH and pOH.
 - 4) Define bond length and bond angle.
 - 5) Prepared 0.25N (100 ml) KCl solution.
- B) Write notes on **any two** of the following. **6**
- 1) Dipole moment.
 - 2) Catalysis.
 - 3) Common ion effect.
3. A) Answer **any two** of the following. **8**
- 1) Explain VBT postulates.
 - 2) Define-Normality, Molarity, Molality and ppm.
 - 3) Explain factors affecting on solubility.
- B) Answer **any one** of the following. **6**
- 1) What is osmotic pressure ? Explain concept of osmosis and reverse osmosis.
 - 2) Explain concept of hybridization with respect to C₂H₄ molecule.



4. A) Answer **any two** of the following. **10**
- 1) Give comparison between ionic and covalent compounds.
 - 2) Derive an integrated rate expression for first order reaction.
 - 3) Explain Molality and Normality with 2 examples of each.
- B) Answer **any one** of the following. **4**
- 1) What is solvation energy ? Explain types of solutions.
 - 2) Explain characteristics of catalysis.
5. Answer **any two** of the following. **14**
- 1) What is buffer ? Derive Henderson equation for acidic buffers.
 - 2) What is solution ? Explain types of solvents.
 - 3) What is sp^3 hybridization ? Explain hybridization of CH_4 molecule.
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B.Sc. I (Semester – I) (Biotechnology) (CBCS Pattern) Examination, 2018
Fundamentals of Chemistry and Biophysics
BIOPHYSICS (Paper – II)

Day and Date : Monday, 12-11-2018
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

1. Multiple Choice Questions.

14

- 1) The matter which remains in its deformed condition is called
 - a) Rubber
 - b) Paper
 - c) Plastic material
 - d) None of these
- 2) The cgs unit of stress is
 - a) dyne/cm²
 - b) cm²/dyne
 - c) $\Delta l/\Delta L$
 - d) n/s
- 3) Hook's law is
 - a) Stress \propto strain
 - b) Stress \propto 1/strain
 - c) Strain/Stress
 - d) All of the above
- 4) The substance is highly soluble in a liquid then the surface tension of liquid
 - a) Increases
 - b) Decreases
 - c) Does not change
 - d) Either decrease or increase
- 5) The actual path taken by the particle of fluid is
 - a) Streamline
 - b) Parallel
 - c) Randomly
 - d) Interrupted
- 6) The tangential force opposing the relative motion between the adjacent layers is
 - a) Magnetic force
 - b) Mechanical force
 - c) Viscous force
 - d) Force of attraction
- 7) SI units of viscosity
 - a) Newton.second/m²
 - b) m/s
 - c) N/sec²
 - d) s/m
- 8) The force of attraction between molecules of different substances is
 - a) Attraction force
 - b) Collision force
 - c) Electronic force
 - d) Adhesive force

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- 9) Molecular range of solids and liquids, it is the order of
a) 10^{-2} b) 10^{-9} c) 10^{-7} d) 10^{-6}
- 10) For propagation of _____ material medium is required.
a) Mechanical waves b) α -rays
c) Light waves d) X-rays
- 11) Surface tension of liquids _____ with rise in temperature.
a) Increases b) May increases or decreases
c) Decreases d) Does not change
- 12) Electromagnetic waves are waves which can travel through the _____ of outer space.
a) Vacuum b) Pressure
c) Vacuum and pressure d) All of the above
- 13) Ultrasonic wave is a sound wave transmitted at a frequency greater than
a) 20 hz b) 20 khz c) 200 hz d) 2 hz
- 14) Reflection is the _____ of a wavefront at an interface between two different media.
a) Equal in direction b) Same direction
c) Change in direction d) Parallel in direction
2. A) Answer the following (**any four**). **8**
- 1) Define Young's modulus.
 - 2) What do you mean by Hooks law ?
 - 3) What is meant by Surface Tension and Surface Energy ?
 - 4) State the principle of superposition of waves.
 - 5) What is meant by ultrasonic and infrasonic waves ?
- B) Write a note on (**any two**). **6**
- 1) Elasticity
 - 2) Nicol prism
 - 3) Applications of laser.



3. A) Answer the following. 8
- 1) Explain the term stress strain curve
 - 2) Give an explanation on Effect of temperature and pressure on viscosity of liquids.
 - 3) Explain the terms :
 - a) Streamline
 - b) Turbulent Flow.
- B) Answer the following (**any one**). 6
- 1) With a neat diagram explain working of Venturimeter.
 - 2) Define capillary action. What are the applications of capillary action ?
4. A) Answer the following (**any two**). 10
- 1) Discuss the factors affecting surface tension.
 - 2) What are transverse and longitudinal waves ? State any three characteristics.
 - 3) Define beat and explain any three applications of beat.
- B) Answer the following (**any one**). 4
- 1) Explain any two applications of ultrasonic waves.
 - 2) Explain the terms reflection and refraction.
5. Answer the following (**any two**). 14
- 1) Explain the working of Pitot's tube.
 - 2) Describe Jaegers method for measurement of Surface tension.
 - 3) With a neat diagram explain working of Helium-Neon Laser.
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- iii) What are PPLOs ?
 - iv) What is cell synchrony ?
 - v) What are F-actin ?
 - vi) Distinguish between equational and reductional division.
- B) Answer the following questions (**any 2**). **6**
- i) What are tight junctions ?
 - ii) Write note on polyribosomes.
 - iii) What is facilitated diffusion ?
3. A) Answer the following questions (**any 2**). **8**
- i) Describe structure giant chromosomes.
 - ii) Describe ultra structure of animal cell.
 - iii) Explain properties of cancer cell.
- B) Answer the following (**any 1**). **6**
- i) Describe different types of cell signaling.
 - ii) Explain fluid mosaic model of plasma membrane.
4. A) Answer the following questions (**any 2**). **10**
- i) Describe ultra structure of nucleus.
 - ii) Describe structure and functions of microtubules.
 - iii) Describe active transport with suitable examples.
- B) Answer the following (**any 1**). **4**
- i) Describe process of mitosis.
 - ii) Define genetic code and give its properties.
5. Answer the following questions (**any 2**). **14**
- i) Describe process of apoptosis.
 - ii) Explain different types of cell organelles, chloroplast and Golgi bodies.
 - iii) Describe process of protein trafficking in endoplasmic reticulum and mitochondria.



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B.Sc. – I (Biotechnology) (Semester – I) (CBCS) Examination, 2018
Cell Biology and Biostatistics
Paper – II : BIOSTATISTICS

Day and Date : Wednesday, 14-11-2018
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

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

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

14

- 1) Total angles in Pie chart are
a) 270° b) 720° c) 360° d) 180°
- 2) Less than type cumulative frequency is
a) Fixed b) Decreasing c) Increasing d) One
- 3) The mean of distribution is 14 and the standard deviation is 5. What is the value of the coefficient of variation ?
a) 60.4% b) 48.3% c) 35.7% d) 27.8%
- 4) The mean of the distribution is 23, the median is 24 and the mode is 25.5. It is most likely that the distribution is
a) Positively Skewed b) Symmetrical
c) Asymptotic d) Negatively Skewed
- 5) Variance is always calculated from
a) Mode b) Mean c) Median d) Range
- 6) In a week the prices of a bag of rice were 350, 280, 340, 290, 320, 310, 300. The range is
a) 60 b) 90 c) 70 d) 100



- 7) A coefficient of correlation is computed to be -0.95 means that
- The relationship between two variables is weak
 - The relationship between two variables is strong and positive
 - The relationship between two variables is strong and but negative
 - Correlation coefficient cannot have this value
- 8) If $r = 0.6$ and $b_{xy} = 1.2$ then $b_{yx} =$
- 0.3
 - 0.2
 - 0.72
 - 0.40
- 9) If the occurrence of one event means that another cannot happen, then the events are
- Independent
 - Mutually Exclusive
 - Bayesian
 - Empirical
- 10) A fair coin is tossed four times, the probability of getting four heads is
- $1/4$
 - $1/2$
 - $1/16$
 - 1
- 11) Let A be event of rolling a die. Let B be event of an even prime number, then $A \cap B$ is
- $\{2, 3, 5\}$
 - $\{2\}$
 - $\{4, 6\}$
 - $\{\}$
- 12) The sum of the probabilities of all sample events in the sample space must be equal to
- 0
 - -1
 - 1
 - 0.5
- 13) In hypothesis testing, the hypothesis which is tentatively assumed to be true is called
- Correct hypothesis
 - Null hypothesis
 - Alternate hypothesis
 - Level of significance
- 14) A Type II error is the error of
- Accepting H_0 when it is false
 - Accepting H_0 when it is true
 - Rejecting H_0 when it is false
 - None of the above

2. A) Answer the following (**any four**).

8

- Define 'Class Mark' and give an example.
- The marks obtained by 8 students are 67, 49, 73, 64, 57, 66, 71, 75. Calculate the mean marks.

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- 3) If $b_{yx} = 0.2$ and $b_{xy} = 0.8$, then find r .
- 4) What is the probability of getting “an odd number” in single throw with die ?
- 5) If Standard Deviation of 5 observations is 5.2, find standard error.

B) Write notes on the following **(any two)**. 6

- 1) Demerits of “Mean”.
- 2) Perfect positive correlation.
- 3) Independent events.

3. A) Answer the following **(any two)**. 8

1) Calculate mode marks from the following data.

X	10-20	20-30	30-40	40-50	50-60
F	7	14	26	16	7

2) Find the Mean Deviation from the following data.

X	10	11	12	13	14
F	3	12	18	12	5

3) A single card is drawn from a pack of 20 cards, numbered from 1 to 20. Find the probability that it is a multiple of 2 or a multiple of 3.

B) Answer the following **(any one)**. 6

1) Find the mean using step deviation method for the following data

X	10-20	20-30	30-40	40-50	50-60
F	15	16	34	22	13

2) A coin is tossed 50 times of which head comes 32 times. Use chi-square test to test the hypothesis that the coin is normal, having no bias for either head or tail. (Table value : 3.84).

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

1) Find median for the following data.

X	10-20	20-30	30-40	40-50	50-60
F	18	21	36	25	20



2) Find the coefficient of correlation (r) from the following data.

X	6	7	8	9	10
Y	8	9	10	11	12

3) Find the Standard Deviation (σ) from the following data :

Class	7	8	9	10	11
Frequency	9	12	8	6	5

B) Answer the following (**any one**).

4

1) Draw histogram for the following data.

X	0-100	100-200	200-300	300-400	400-500	500-600
F	9	19	27	22	26	7

2) For the two events A and B, $P(A) = 0.5$, $P(B) = 0.6$ and $P(A \cup B) = 0.8$.
Find $P(A | B)$ and $P(B | A)$.

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

14

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

X	5-10	10-15	15-20	20-25	25-30
F	8	11	16	15	10

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

X	5	3	7	4	8	2	10	6	8	7
Y	8	6	8	5	9	6	8	5	11	4

3) Write the properties of the normal distribution.



B) Answer **any three** of the following in **30 to 40** words. **6**

- 1) What is the origin and background of the poem Brahma ?
- 2) Who does the speaker address at the end of the poem Brahma ?
- 3) Who were the watchers of the moon ? What happened to them ?
- 4) How was the moon's light made holy in Gethsemane ?

4. You are the secretary of the Bharat Sport Club in your town. The meeting of the office bearer of the club is scheduled on 15 of the next month prepare an agenda and minutes for the meeting. **14**

OR

Write an email forwarding job application for the post of software developer in Patel IT Solutions. **14**

5. Prepare a curriculum vitae to apply for the post of software developer. **14**



- 7) At the break of day, the weavers wove a gay garment for a new-born
a) puppy b) monster c) baby d) pet
- 8) Maya Angelou was worried about the death of her
a) enemies b) critics
c) rivals d) near and dear ones
- 9) The moonlight chill is paralleled with _____ by Sarojini Naidu.
a) birth b) death
c) regeneration d) salvation
- 10) *When I think of death* is
a) a sonnet b) a lyric
c) a free verse d) an ode
- 11) He was sanctioned a _____ of 10 lakh rupees.
a) lone b) loan c) loun d) loen
- 12) We celebrate Mahatma Gandhi's _____ Anniversary on 2nd October.
a) berth b) barth c) birth d) breath
- 13) She runs a _____ shop.
a) stationary b) stationer
c) stationery d) stationory
- 14) The _____ today is quite pleasant.
a) wither b) weather c) whether d) whather
2. Answer the following bits in **two to three** sentences **each (any seven)** : **14**
- 1) Why did the students feel that their teacher would forget them ?
 - 2) Describe the two types of neighbours according to Ernest Barker.
 - 3) How did Jim Corbett suppress his cough ?
 - 4) Why did the poor children fail the gymnastics examination ?
 - 5) What are the natural claims of our neighbours ?
 - 6) What was the tiger doing when Corbett went near it ?
 - 7) What were the poor boys good at ?
 - 8) What is the meal of a fully grown tiger ?



3. A) Answer the following questions in about **50** words **each (any two)** : **8**
- 1) What are the qualities of a good email ?
 - 2) What is the format of a formal email ?
 - 3) What is the process of writing a blog ?
- B) Explain with reference to the context **(any two)** : **6**
- 1) “Weavers, weaving at fall of night,
Why do you weave a garment so bright ?
Like the plumes of a peacock, purple and green,
We weave the marriage-veils of a queen”.
 - 2) “I find it impossible to let a friend or relative
Go into that country of no return”.
 - 3) “Weavers, weaving solemn and still,
What do you weave in the moonlight chill ?
White as a feather and white as a cloud,
We weave a dead man’s funeral shroud”.
4. A) What is an interview ? Write a detailed note on the objectives of interview and the types of interview.
- OR
- B) Write the script of a group discussion on the topic “Corruption: A Monster” discussed by Amit, Deepika, Saleem and Mohan. **14**
5. What is the importance of Minutes ? Bring out the types of Minutes along with its features. **14**
-



2. Define and explain **any seven** of the following : **14**
- i) Marine pollution.
 - ii) Acid rain.
 - iii) Draw diagram of cyclone chamber.
 - iv) Thermal pollution.
 - v) Pollutant with two example.
 - vi) Isotopes.
 - vii) Soil pollution.
 - viii) Non Conventional Energy.
 - ix) Pyrolysis.
3. A) Answer **any two** of the following : **10**
- i) Write a note on Green house effect.
 - ii) Explain in brief the air pollution.
 - iii) Explain in short the solar energy.
- B) Explain in short adverse effect of noise pollution. **4**
4. Answer **any two** of the following : **14**
- i) Give a detailed account on effect of water pollution on human and environment.
 - ii) Explain in detail the molasses fermentation for alcohol production.
 - iii) Describe in detail conventional energy sources.
5. Answer **any two** of the following : **14**
- i) Explain in detail treatment on nuclear waste.
 - ii) Write an essay on impact of pollution.
 - iii) Explain in detail land pollution.
-



- v) Define Diauxic growth.
 - vi) Give any two examples of differential media.
 - vii) Define dye and stain.
 - viii) Define sterilization.
 - ix) Give different methods of maintenance of pure culture.
3. A) Answer **any two** (out of three) of the following. **10**
- i) Explain classification of stains.
 - ii) Give any two methods used for cultivation of anaerobic bacteria.
 - iii) Acid fast staining.
- B) Synchronous growth. **4**
4. Answer **any two** of the following. **14**
- i) Explain different phases of growth of bacteria.
 - ii) Give methods of sterilization.
 - iii) Explain mechanism of Gram staining.
5. Answer **any two** of the following. **14**
- i) Give Nutritional requirements of bacteria.
 - ii) Give methods of isolation of pure culture of bacteria.
 - iii) Explain living media and its function.
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B.Sc. Biotechnology – I (Semester – II) Examination, 2018
Taxonomy (CBCS) (Paper – I)
TAXONOMY AND TISSUE CULTURE

Day and Date : Thursday, 22-11-2018
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

1. Multiple choice questions.

14

- 1) Frog belongs to class _____
 - a) Pisces
 - b) Aves
 - c) Arthropoda
 - d) Amphibia
- 2) Agar agar is manufactured from _____
 - a) Ectocarpus
 - b) Polysiphonia
 - c) Spirogyra
 - d) Gelidium
- 3) Cryophytes are found in _____
 - a) Deep sea
 - b) One sea shore
 - c) On ice and snow
 - d) On humous soil
- 4) Fungi exhibit _____ mode of nutrition.
 - a) Autotrophic
 - b) Heterotrophic
 - c) Phototrophic
 - d) Holozoic
- 5) Egg apparatus consist of _____
 - a) Egg and antipodals
 - b) Polar nuclei
 - c) Egg and synergids
 - d) Egg
- 6) The physiological properties of a cell can be studied by analysis of _____ characteristics.
 - a) Morphological
 - b) Cultural
 - c) Biochemical
 - d) Numerical



2. Answer **any seven** of the following : **14**
- i) Give the characteristics of Mollusca.
 - ii) Define Mycotoxins.
 - iii) Write a note on Numerical Taxonomy.
 - iv) Distinguish between Monocot and Dicot.
 - v) Give the economic importance of Bryophytes.
 - vi) Linnaeus Hierarchy of classification.
 - vii) Fragmentation reproduction.
 - viii) Lichens.
 - ix) Draw a neat and labelled diagram of Liver fluke.
3. A) Answer **any two** of the following : **10**
- i) Explain in detail general characters Pisces.
 - ii) Describe in detail Three kingdom classification.
 - iii) Give the general characteristics of thallophyte.
- B) Explain the salient features of Aves with proper example. **4**
4. Answer **any two** of the following : **14**
- i) Describe microbial phenetic and phylogenetic taxonomy.
 - ii) Discuss in detail Sporne classification of Gymnosperm.
 - iii) Explain in detail sexual and asexual reproduction in plants with example.
5. Answer **any two** of the following : **14**
- i) Explain in detail general characteristics and classification fungi.
 - ii) Describe in detail Platyhelminthes with example.
 - iii) Give detail account on Reptiles.



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B.Sc. Biotechnology (Semester – II) (CBCS) Examination, 2018
TAXONOMY AND TISSUE CULTURE
Paper – II : Tissue Culture

Day and Date : Saturday, 24-11-2018
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

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

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

- 1) The part of a plant used for culturing is called
 - a) Callus
 - b) Cell Wall
 - c) Stock
 - d) Explant
- 2) The fusion of nucleated cell with enucleated cell leads to form _____
 - a) Chromosome
 - b) Symmetric Hybrid
 - c) Hybrid
 - d) Cybrid
- 3) Stomata were more open in plants grown in presence of higher _____ concentration.
 - a) Calcium
 - b) Potassium
 - c) Sodium
 - d) Magnesium
- 4) _____ is the largest organ in human body.
 - a) Skin
 - b) Lungs
 - c) Intestine Lungs
 - d) Heart



- 5) _____ method is quick and cheap method of cell separation.
- a) Laboratory b) Physical
c) Enzymatical d) Clinical
- 6) _____ described procedure to obtain passaged monolayer.
- a) Haberlandt b) Dulbecco
c) Carrel d) Eagle
- 7) _____ is a vitamin used in PTC media.
- a) Inositol b) Cysteine
c) Biotin d) Glycine
- 8) _____ is a culture without foreign or undesired life forms.
- a) Septic Culture b) New Culture
c) Axenic Culture d) Novel Culture
- 9) _____ is the liquid endosperm from immature coconuts, used as a supplement in the culture medium.
- a) Agar b) Casein
c) Juice d) Coconut Milk
- 10) Highest concentration of auxin exist at the _____
- a) Base of any plant organ b) Leaves
c) In Xylem d) Growing tips of plants
- 11) Most common measurement of viability is based on _____
- a) Membrane Integrity b) Dye uptake assay
c) Dye exclusion assay d) Metabolic assay
- 12) _____ cells have finite life span on artificial medium.
- a) Normal b) Tumor
c) Cancerous d) Defected



4. Answer the following (**any two**) : **14**
- 1) Discuss the role of different components of serum.
 - 2) Explain in detail callus culture.
 - 3) Describe in detail suspension culture.
5. Answer the following (**any two**) : **14**
- 1) Define viability and explain membrane integrity and Dye exclusion assay.
 - 2) Give details of instruments used in ATC laboratory.
 - 3) Explain laboratory design for plant tissue culture.
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**B.Sc. – I (Biotechnology) (Semester – II) (CBCS)
Examination, 2018
BIOCHEMISTRY AND CELL PHYSIOLOGY
Paper – I : Biochemistry**

Day and Date : Monday, 26-11-2018
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

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

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

- 1) Number of carbon atoms in cholesterol is _____
a) 17 b) 19 c) 27 d) 30
- 2) Vitamin K is found in _____
a) Green leafy plants b) Meat
c) Fish d) Milk
- 3) Primary structure of proteins involves _____ type of bond.
a) Peptide b) Hydrogen c) Disulfide d) Glycosidic
- 4) _____ optically inactive amino acid.
a) Alanine b) Glycine c) Valine d) Leucine
- 5) _____ is an example of aldose sugar.
a) Glycerose b) Ribulose
c) Erythrulose d) Dihydroxyacetone
- 6) Amylose is constituent of _____ carbohydrate.
a) Glycogen b) Cellulose
c) Inulin d) Starch



- iv) Write a note on peptide bond.
 - v) Draw the neat labeled diagram of t-RNA.
 - vi) Write biochemical role of thiamine and riboflavin.
 - vii) Give the function of triglycerides and phospholipids.
 - viii) Write a note on water soluble vitamins.
 - ix) Define zwitterions and isoelectric point.
3. A) Answer the following (**any 2**) : **10**
- i) Explain forces involved in protein structure.
 - ii) Distinguish between DNA and RNA.
 - iii) Write a note on monosaccharides derivatives.
- B) Explain fluid mosaic model of plasma membrane. **4**
4. Answer **any two** of the following : **14**
- i) Describe classification of amino acids with examples and structures.
 - ii) Write a note on Watson and Crick model of DNA.
 - iii) Define carbohydrates and write in detail classification of carbohydrates.
5. Answer **any two** of the following : **14**
- i) Explain components of nucleic acids with primary structure of nucleic acids.
 - ii) Write a note on structural levels of proteins with examples.
 - iii) Write source, requirement and biochemical role of niacin and thiamine.
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B.Sc. – I (Biotechnology) (Semester – II) (CBCS) Examination, 2018
Biochemistry and Cell Physiology
Paper – II : CELL PHYSIOLOGY

Day and Date : Tuesday, 27-11-2018
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

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

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

- 1) The percentage of water in Watermelon is _____
a) 90% b) 92% c) 95% d) 94%
- 2) The process of absorption of water by seeds is called _____
a) Transpiration b) Translocation
c) Imbibition d) Plasmolysis
- 3) Root nodules of leguminous plants appear pink due to the presence of _____
a) Haemoglobin b) Iron haemoglobin
c) Zinc haemoglobin d) Leg haemoglobin
- 4) Zeatin the naturally occurring cytokinin was isolated from _____
a) Corn Kernel b) Apple
c) Sugarcane d) Grapes
- 5) Human adult has _____ permanent teeth.
a) 36 b) 23 c) 46 d) 32



- II. Answer the following (**Any 7**). **14**
- 1) Define Transpiration.
 - 2) Define Plasmolysis.
 - 3) Define Neurons.
 - 4) Define Alveoli.
 - 5) What are long day plants ?
 - 6) Name two uricotelic animals.
 - 7) What are Schwann cells ?
 - 8) Write the difference Actin and Myosin.
 - 9) Write the two sets of bones composed in the Skull.
- III. A) Answer **any two** of the following. **10**
- 1) Discuss the factors responsible for ascent of Xylem sap in plants.
 - 2) Write in detail about the Nitrogen Fixation in plants.
 - 3) Discuss in detail about photoperiodism.
- B) **Solve :** **4**
- Describe human respiratory system with neat labelled diagram.
- IV. Answer **any two** of the following. **14**
- 1) Describe types, phases and factors affecting seed dormancy.
 - 2) Explain different types of transpiration.
 - 3) Explain structure, synthesis and functions of Gibberellins.
- V. Answer **any two** of the following. **14**
- 1) Describe human Nervous system with neat labelled diagram.
 - 2) Describe mechanism of urine formation with neat labelled diagram.
 - 3) Describe structure of human heart with neat labelled diagram.
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B.Sc. – I Biotechnology (Semester – II) (CBCS) Examination, 2018
BIOMETRY AND COMPUTER SCIENCE
Paper – I : Biometry

Day and Date : Wednesday, 28-11-2018
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

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

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

14

- 1) The solution of the equation $3x + 6 = 0$ is _____
a) A natural number b) An integer
c) A whole number d) An irrational number
- 2) The square of the complex number $4i - 3$ is _____
a) $16i + 9$ b) $-16i - 9$
c) 25 d) $-7 - 24i$
- 3) If $A = \{4, 5, 6, 7\}$ and $B = \{4, 7, 8, 9\}$ then $A - B =$ _____
a) $\{5, 6\}$ b) $\{0, -2\}$
c) $\{ \}$ d) $\{4, 7\}$
- 4) A function f is said to be an even function if
a) $f(x) = f(-x)$ b) $f(-z) = -f(x)$
c) $f(x^2) = [f(x)]^2$ d) $f(2x) = 2f(x)$



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

14

- 1) Find the value of $i^{14} + i^5 - i^{16} - i^7$.
- 2) If $X = \{2, 9\}$ then find Power set $P(X)$ of X .
- 3) If $f(x) = 7x + 1$ and $g(x) = 5x - 2$ then find $f \circ g$.
- 4) If $\lim_{x \rightarrow p} \frac{x^4 - p^4}{x - p} = 108$, find p .
- 5) If $f(x) = \begin{cases} 7 + 3x & \text{for } x \neq 2 \\ 8 & \text{for } x = 2 \end{cases}$, then examine the continuity of function at $x = 2$.
- 6) If $y = x^{35}$, then find $\frac{dy}{dx}$.
- 7) Evaluate $\int 3 \sec^2 x - 4 \cos \sec^2 x \, dx$.
- 8) Evaluate $\int_0^1 5^{2x} \, dx$.
- 9) Solve differential equation $2y + 3x \frac{dy}{dx} = 0$.

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

10

- 1) Evaluate $\lim_{x \rightarrow 5} \frac{2x^2 - 18x + 40}{2x^2 - 12x + 10}$
- 2) Differentiate $\frac{\sin^2 x}{x^2 + 3}$ with respect to x .
- 3) Evaluate $\int 2x^2 \sin x \, dx$.

B) Solve the following :

4

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



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

14

1) If $z_1 = 2 - 3i$, $z_2 = 1 + 3i$, $z_3 = 8 + 3i$ and $z_4 = 7 - 9i$ find $\frac{z_1 + z_2}{z_4 - z_3}$

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

3) Find the maximum and minimum value of the function $f(x) = 2x^3 + 6x^2 - 18x + 7$

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

14

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

2) If $f(x) = \begin{cases} \frac{e^{3x} - 1}{x} + a & \text{for } x > 0 \\ \frac{\tan 2x}{2} + 4 - b & \text{for } x < 0 \\ 5 & \text{for } x = 0 \end{cases}$ is continuous at $x = 0$ then find a, b

3) Solve the equations $x + y + z = 3$, $x + 2y + 3z = 6$, $x + 3y + 4z = 8$ using reduction method or Gaussian Elimination method of matrix.



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B.Sc. – I (Semester – II) (Biotechnology) (CBCS Pattern) Examination, 2018
Biometry and Computer Science (Paper – II)
COMPUTER SCIENCE

Day and Date : Thursday, 29-11-2018
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

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

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

- 1) _____ topology has central controller point.
a) Bus b) Star c) Tree d) Square
- 2) The protocol that is used to transfer file is _____
a) FTP b) HTML c) HTTP d) SMTP
- 3) For DBMS _____ software is used.
a) MS Word b) MS Excel
c) MS PowerPoint d) MS Access
- 4) Rearranging the data in a sequence is called _____
a) Updating b) Editing
c) Batching d) Sorting
- 5) E-mail stands for _____
a) Electronic mail b) Electronically mail
c) Exchange mail d) None
- 6) 1 byte is equal to _____ bits.
a) 4 b) 8 c) 32 d) 64



- 7) The protocol that web servers and clients used to communicate with each other is called
- a) HTTP b) HTML c) SMTP d) URL
- 8) _____ is a step by step instructions which are written for solving a problem.
- a) Algorithm b) Flow chart
c) Picture chart d) Picture code
- 9) To cut, the shortcut key is _____
- a) Ctrl + X b) Ctrl + P c) Ctrl + V d) Ctrl + C
- 10) _____ is a default file name of excel.
- a) Book 1 b) Document 1
c) Presentation 1 d) Table 1
- 11) ROM stands for _____
- a) Read OMR memory b) Read Only Memory
c) Random Operating Memory d) None
- 12) _____ devices accepts data from the end user.
- a) Output b) Input c) Storage d) Utility
- 13) The processed data is called _____
- a) Data b) Software
c) Information d) Operating system
- 14) _____ topology has common cable.
- a) Ring b) Bus c) Star d) Hybrid

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

14

- i) Explain application software with example.
- ii) Explain how you will change font and font size in word.
- iii) Enlist any four output devices.



- iv) Explain ALU and Control unit.
 - v) Define the following terms
 - 1) Information 2) Data
 - vi) Explain use of Modem in networking.
 - vii) Explain Medium sized Area Network.
 - viii) Explain the importance of database.
 - ix) Explain any two methods to calculate average in excel.
3. A) Write short notes on **any two** of the following : **10**
- i) Explain the use of internet.
 - ii) Explain how will you prepare chart in excel.
 - iii) Explain Basic Components of Digital Computer.
- B) Write a note on Operating System. **4**
4. Answer **any two** of the following : **14**
- i) What is Computer ? Explain different units of computer.
 - ii) Explain page formatting in word document.
 - iii) Explain Intranet and Extranet.
5. Answer **any two** of the following : **14**
- i) Explain the elements of communication with diagram.
 - ii) Explain modem and its types.
 - iii) Define the term Flow chart and explain different symbols of flow chart.
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B.Sc. – II (Biotechnology) (Semester – III) (CBCS) Examination, 2018
INHERITANCE BIOLOGY

Day and Date : Friday, 30-11-2018

Max. 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) _____ plays important role in the extra nuclear inheritance.
a) lysosomes and chloroplast b) lysosomes and plasmids
c) ribosomes and chloroplast d) mitochondria and chloroplast
- 2) In linkage mapping, the distance between two genes is measured in terms of _____.
a) Centimorgan b) Base pairs
c) Metre d) Nanometer
- 3) Typical dihybrid test cross ratio is _____.
a) 9 : 3 : 3 : 1 b) 1 : 1
c) 9 : 3 : 4 d) 1 : 1 : 1 : 1
- 4) _____ is not a dominant trait.
a) Round seeds b) Purple flowers
c) Yellow pods d) Inflated pods
- 5) The XX-XY sex determination system is occurred in _____.
a) Grasshoppers b) Birds
c) Human d) Honeybee
- 6) Eye color in Drosophila is an example of _____.
a) Dominance b) Multiple alleles
c) Incomplete dominance d) Complementation
- 7) _____ studied the ABO blood groups in humans.
a) Thomas Sech b) Mendel
c) T. H. Morgan d) Karl Landsteiner



- 8) In honeybees, drones are _____
a) diploid fertile males b) haploid fertile females
c) diploid sterile males d) haploid fertile males
- 9) In _____ the typical Mendelian dihybrid ratio is changed to 13 : 3.
a) Complementary gene action b) Supplementary gene action
c) Inhibitory gene action d) None of these
- 10) _____ in the *Saccharomyces cereviviae* were first discovered
B. Ephrussi.
a) Auxotrophic mutants b) Petite mutants
c) Lac mutants d) Ara mutants
- 11) _____ is not a X-linked disease.
a) Hemophilia b) Colorblindness
c) Hypertrichosis d) Night blindness
- 12) In _____ bacterial strain natural transformation is absent.
a) *B. subtilis* b) *H. influenzae*
c) *D. pneumoniae* d) *E. coli*
- 13) In the _____ fertility plasmids are actively engaged.
a) Transformation b) Conjugation
c) Transduction d) Transfection
- 14) The process of transduction was discovered by _____ in bacteria.
a) A. Hershey and M. Chase
b) J. Lederberg and E. Tatum
c) J. Lederberg and N. Zinder
d) Avery MacLeod and McCarthy

2. A) Answer the following questions (**any 4**) :

8

- i) What is epistatic gene ?
- ii) Write significance of linkage
- iii) Define multiple alleles.
- iv) Write a note on colorblindness.
- v) Write a note on inhibitory genes.

B) Answer the following questions (**any 2**) :

6

- i) What are *tra* genes in conjugation ?
- ii) What are petite mutants in yeast ?
- iii) Genetic system in plasmids.



3. A) Answer the following questions (**any 2**) : **8**
- i) Describe genetic system in mitochondria.
 - ii) Describe genetic system in chloroplast.
 - iii) Write note on X chromosome in humans.
- B) Answer the following (**any 1**) : **6**
- i) Describe maternal inheritance with any two suitable examples.
 - ii) Describe law of independent assortment with suitable example.
4. A) Answer the following questions (**any 2**) : **10**
- i) Describe Y linked inheritance with any two suitable examples.
 - ii) Explain process of transformation in bacteria.
 - iii) Describe process of crossing over with neat labeled diagram.
- B) Answer the following (**any 1**) : **4**
- i) Describe incomplete and co-dominance with suitable example.
 - ii) What is complementation test ?
5. Answer the following questions (**any 2**) : **14**
- i) Describe mechanism of conjugation with neat labeled diagram.
 - ii) Describe gene mapping by tetrad analysis.
 - iii) Describe inheritance of supplementary and complementary genes with suitable example.
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No.Set **P****B.Sc. – II (Biotechnology) (Semester – III) (CBCS) Examination, 2018
BASICS OF MOLECULAR BIOLOGY**

Day and Date : Saturday, 1-12-2018

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 diagram **wherever** necessary.

1. Multiple choice questions :

14

- 1) Central Dogma was proposed by
 - a) T.H. Morgan
 - b) Gregor Mendel
 - c) Francis Crick
 - d) J. D. Watson
- 2) The enzyme which regulates the level of super coiling of DNA molecule is
 - a) DNA Ligase
 - b) DNA Polymerase
 - c) Topoisomerase
 - d) DNA Helicase
- 3) Large *Cot* values indicates presence of sequences
 - a) Highly repeated sequences
 - b) Moderately repeated sequences
 - c) Unique sequences
 - d) All of these
- 4) The bases in DNA are joined to the pentose sugar by _____ bond.
 - a) Glycosidic
 - b) Covalent
 - c) Ionic
 - d) Hydrogen
- 5) _____ repeats of Telomeres protect free chromosome ends from degradation.
 - a) TTAGGGG
 - b) TTACCCC
 - c) TTAAAAA
 - d) TTAATTT
- 6) The relaxed state of DNA is
 - a) Covalent closed DsDNA
 - b) Closed circular DsDNA
 - c) Covalent circular Ds DNA
 - d) Linear DsDNA
- 7) _____ is act as initiation codon in genetic code of eukaryotes.
 - a) AAA
 - b) AUA
 - c) AUG
 - d) AAG



3. A) Answer the following (**any two**): **8**
- 1) Explain clover leaf model of tRNA with neat diagram.
 - 2) Explain mitochondrial DNA and write its importance.
 - 3) Write in detail about topoisomerases.
- B) Answer the following (**any one**): **6**
- 1) Discuss the different types of DNA.
 - 2) Explain SOS repair Mechanism in DNA.
4. A) Answer the following (**any two**): **10**
- 1) Explain properties of double helix of DNA with neat labelled diagram.
 - 2) Describe Meselson and Stahls experiment of DNA replication with neat labelled diagram.
 - 3) Explain the molecular nature of gene.
- B) Answer the following (**any one**): **4**
- 1) Write about the mismatch repair mechanism of DNA with neat labelled diagram.
 - 2) Write about the process of denaturation of DNA and its importance.
5. Answer the following (**any two**) : **14**
- 1) Describe the organization of DNA in Eukaryotes with a neat labelled diagram.
 - 2) Explain the properties of genetic code with suitable example.
 - 3) Describe D loop model of replication in mitochondria with a neat labelled diagram.
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B.Sc. II Biotechnology (Semester – III) (CBCS) Examination, 2018
BIOPHYSICAL INSTRUMENTS

Day and Date : Monday, 3-12-2018
Time : 2.30 p.m. to 5.00 p.m.

Max. Marks : 70

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

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

- 1) The first working microscope was designed by
 - a) Robert Hook
 - b) Kepler
 - c) Leeuwenhoek
 - d) Watson
- 2) A protein solution shows maximum absorption in _____ range of electromagnetic wavelength.
 - a) UV
 - b) Visible
 - c) IR
 - d) Microwave
- 3) The pH electrode can be calibrated by using a standard _____ solution which resists the change in pH.
 - a) inorganic
 - b) organic
 - c) salt
 - d) buffer
- 4) Pulses of light generated due to ionization of a material by are detected in
 - a) X ray diffraction
 - b) Flow cytometry
 - c) GM counter
 - d) Scintillation counter
- 5) In UV visible spectroscopy, the _____ filament lamp is generally used as a source for generation of UV radiations.
 - a) xenon
 - b) tungsten
 - c) deuterium
 - d) hydrogen
- 6) Molecules can be separated based on their buoyant density by using _____ centrifugation.
 - a) ion exchange
 - b) rate zonal
 - c) isopycnic
 - d) two dimensional



- B) Write a note on **any two** of the following. 6
- 1) Write about sedimentation and RCF. State relationship between them.
 - 2) Explain principle of fluorescence microscopy. Give examples of fluorescent stains.
 - 3) Write principle and instrumentation of IR spectroscopy.
3. A) Answer **any two** of the following. 8
- 1) Describe errors in pH measurement.
 - 2) Describe instrumentation and application of colorimeter.
 - 3) Describe the nature of radioactivity.
- B) Describe in detail **any one** of the following techniques. 6
- 1) Scintillation counter.
 - 2) X ray diffraction.
4. A) Describe in detail **any two** of the following. 10
- 1) Ultracentrifugation.
 - 2) Radioactive decay and its types.
 - 3) Applications and biohazards of radioisotopes.
- B) Describe **any one** of the following : 4
- 1) Molecular energy levels.
 - 2) Types of rotors for centrifugation.
5. Write a detailed account on **any two** of the following. 14
- 1) Electron microscopy and its types.
 - 2) Principle, instrumentation and applications of UV-Visible spectroscopy.
 - 3) Principle working and applications of circular dichorism.
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B.Sc. II (Semester – III) (CBCS) Examination, 2018
BIOTECHNOLOGY
Animal Tissue Culture

Day and Date : Tuesday, 4-12-2018
Time : 2.30 p.m. to 5.00 p.m.

Total Marks : 70

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

- 1) _____ is the concentration of CO₂ required for culturing animal cells.
a) 2 – 5% b) 1 – 10% c) 10 – 15% d) 15 – 20%
- 2) _____ is the main constituent of culture for animal cell growth.
a) Glucose and Glutamine b) Growth factor
c) Cytokinin d) Kinetin
- 3) The human fibroblast cell is example of
a) Stable primary cell line b) Established cell line
c) Transformed cell line d) Secondary cell line
- 4) pH of initial animal cell culture is controlled by
a) Presence of CO₂ b) Bicarbonate buffer
c) Bases d) Acids
- 5) _____ carries DNA into the host cell.
a) mRNA b) Vector c) tRNA d) rRNA
- 6) In _____ year carrel designed suitable flask for routine animal cell culture.
a) 1915 b) 1923 c) 1925 d) 1924
- 7) Loss of _____ of cells is often indicated by a damaged cell membrane.
a) Capability b) Capacity c) Intensity d) Viability
- 8) The term _____ implies a medium that has all its constituents and supplements added and is sufficient for the use specified.
a) MS media b) Complete media
c) Protein media d) Serum free media
- 9) A cell line can be identified by use of fluorescent labeled antibody specific for _____ antigen.
a) Membrane b) Protein c) Lipid d) Internal



4. A) Answer the following (**any two**). **10**
- 1) Define serum and its importance.
 - 2) Explain anchorage dependent cell.
 - 3) Write account on standard culture condition for animal tissue culture.
- B) Answer the following (**any one**). **4**
- 1) Explain cell hybridization.
 - 2) Write an account on DNA fingerprinting method.
5. Answer the following (**any two**). **14**
- 1) Give detailed account on methods involved in analysis of cell cycle.
 - 2) Explain laboratory design for animal tissue culture.
 - 3) Define sterilization and techniques used in sterilization of apparatus and media.
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B.Sc. – II (Biotechnology) (Semester – III) (CBCS) Examination, 2018
BIOENERGETICS AND ENZYMOLOGY

Day and Date : Wednesday, 5-12-2018

Max. 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) The term enzymes are coined by
a) Pasteur b) Buchner c) Urey Miller d) Kuhne
- 2) Number of substrate molecules converted into product by one molecule of enzyme active site per unit time is called
a) Turnover number b) Substrate number
c) Reaction d) None of these
- 3) In uncompetitive inhibition inhibitors binds only to
a) Enzyme b) Substrate
c) ES-complex d) Active site
- 4) Succinate thiokinase is an example of _____ class of enzyme.
a) ligase b) lyase c) isomerase d) oxidoreductase
- 5) Ribozymes are the catalytic _____ molecules.
a) RNA b) DNA c) Antibody d) Vitamin
- 6) The _____ inhibitor molecule does not bind with the active site of enzyme to lower its catalytic.
a) catalytic b) allosteric c) reversible d) irreversible
- 7) Entropy of a system is measure of its
a) hardness b) softness
c) randomness d) spontaneity



3. A) Answer **any two** of the following : **8**
- 1) Explain induced fit mechanism.
 - 2) Write a note on abzymes.
 - 3) Describe biological role of enzymes.
- B) Answer **any one** of the following : **6**
- 1) Describe types of enzyme inhibition.
 - 2) Illustrate free energy of hydrolysis of ATP and its role as an universal currency of free energy in biological systems.
4. A) Answer **any two** of the following : **10**
- 1) Describe types of enzyme specificity.
 - 2) Describe redox reactions. Add a note on redox potential.
 - 3) Describe modes of enzyme regulation in living system.
- B) Answer **any one** of the following : **4**
- 1) Describe clinical significance LDH isoenzymes.
 - 2) Explain the concept of activation energy of enzyme.
5. Write a detailed account on **any two** of the following : **14**
- 1) Write in detail classification of enzyme with two examples of each.
 - 2) Derive Michalis Menten equation. Give significance of V_{max} and K_m .
 - 3) Describe in detail the factors affecting enzyme activity.
-



- viii) _____ cells are called as null or third population cells
a) Tc b) TH c) Dendritic d) NK
- ix) _____ test is used in diagnosis of syphilis.
a) VDRL b) Widal
c) Tuberculin d) Montoux
- x) The signal transduction from one cell to neighboring cell is called as _____
a) Autocrine b) Paracrine
c) Endocrine d) Synergism
- xi) _____ class of immunoglobulin is involved in secondary immune response.
a) IgG b) IgM c) IgA d) IgD
- xii) _____ mediator bind to hypothalamus and induce fever.
a) Prostaglandins b) Histamine
c) Leukotrienes d) Thromboxane
- xiii) Antigenicity is enhanced by adding _____
a) Epitope b) Adjuvant
c) Hapten d) Antibody
- xiv) Example of mucosa associated lymphoid tissue is _____
a) Thymus b) Spleen
c) Payer's patch d) Lymphnode

2. A) Answer the following (**any four**).

8

- i) Synergy and redundancy.
- ii) Enlist secondary lymphoid organs.
- iii) Enlist factors affecting innate immunity.
- iv) Isoantigen and autoantigens.
- v) Function of NK cells.

B) Write note on (**any two**).

6

- 1) Factors affecting antigenicity.
- 2) TH cells and Tc cells.
- 3) Structure and function of spleen.

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3. A) Answer the following (**any two**). **8**
- i) Explain structure and function of MHC class I molecule.
 - ii) Explain mechanism of phagocytosis.
 - iii) Explain structure and function of antibody molecule.
- B) Answer the following (**any one**). **6**
- i) Physical barriers of Innate Immunity.
 - ii) Write an essay on principle of antigen and antibody interaction.
4. A) Answer the following (**any two**). **10**
- i) Explain any two antigen and antibody reactions by precipitation.
 - ii) Explain properties of cytokines.
 - iii) Explain Radioimmunoassay.
- B) Answer the following (**any one**). **4**
- i) Explain structure and function of cytokine receptors.
 - ii) Explain B cells.
5. Answer of the following (**any two**). **14**
- i) Explain structure and function of primary lymphoid organs.
 - ii) Explain ELISA.
 - iii) Programmed cell death.
-



3. A) Attempt **any two** of the following : **10**
- 1) Describe the structure of chromosome with a neat labeled diagram.
 - 2) Explain in detail types of Mutagenic agents and its effects.
 - 3) Explain in detail mini-satellite DNA.
- B) Write in detail about the process of Meiosis and add a note on its significance. **4**
4. Attempt **any two** of the following : **14**
- 1) Write in detail about the numerical changes in chromosome with its application.
 - 2) Write in detail about the different types of bacterial transposons.
 - 3) Write in detail about giant chromosomes with neat labeled diagram.
5. Attempt **any two** of the following : **14**
- 1) Write in detail Hardy-Weinberg law and its application.
 - 2) Describe multiple factor hypothesis with suitable examples.
 - 3) Describe the genetic basis of evolution in Brassica and Wheat.
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B.Sc. – II Biotechnology (Semester – IV) (CBCS) (New) Examination, 2018
MECHANISMS IN MOLECULAR BIOLOGY

Day and Date : Saturday, 8-12-2018

Total Marks : 70

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

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

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

- 1) _____ are added to specific lysine residues on the core histones by a family of enzymes called histone acetyltransferases.
 - a) Acetyl groups
 - b) Formyl groups
 - c) Ethyl groups
 - d) Methyl groups
- 2) In lactose operon, β -Galactosidase enzyme is encoded by _____ gene.
 - a) lac 'a'
 - b) lac 'i'
 - c) lac 'z'
 - d) lac 'y'
- 3) In prokaryotes _____ directly binds to 'P' site of ribosomes during initiation of translation process.
 - a) tRNA^{met}
 - b) tRNA^{fmet}
 - c) tRNA^{pro}
 - d) tRNA^{val}
- 4) _____ enzymes required for charging of tRNA molecule.
 - a) Aminoacyl tRNA synthetase
 - b) DNA glycosylase
 - c) Peptidyl di-sulphide isomerase
 - d) Peptidyl transferase
- 5) T ψ C loop of tRNA helpful for binding to _____.
 - a) Amino acids
 - b) Ribosomes
 - c) tRNA
 - d) Aminoacyl tRNA synthetase



- 6) Formulated methionine amino acid specified by _____ codon in prokaryotes.
- a) AGU b) AUG c) UAG d) GUG
- 7) _____ are expressed from heat shock genes in response to elevated temperatures in *E.coli*.
- a) Chaperons b) DNA methylases
c) Histone methylases d) Histone methyltransferases
- 8) In eukaryotes, 5S rRNA is transcribed by
- a) RNA Polymerase α b) RNA polymerase II
c) RNA polymerase III d) RNA polymerase I
- 9) _____ is required for termination of transcription process in prokaryotes.
- a) Sigma factor b) Rho factor
c) Pol- α d) Core enzyme
- 10) During mRNA processing _____ is required for capping of primary transcripts.
- a) Poly 'A' polymerase b) snRNPs
c) RNA Polymerase III d) RNA polymerase I
- 11) Shine-Dalgarno sequences are _____
- a) AGGAGGU b) TTAGGG c) CAAT d) TATA
- 12) Robert Holly proposed _____
- a) Clover leaf model of tRNA b) Double helical structure of DNA
c) Hairpin loop model of tRNA d) Operon model
- 13) _____ is responsible for proper recognition of 3' splice site during slicing process.
- a) SR proteins and U2AF b) Polyribosomes
c) Enhanceosome d) Replisome
- 14) Pan-editing starts with the base-pairing of the unedited primary transcript with a
- a) mRNA b) snRNA c) miRNA d) gRNA



2. Answer the following (**any 7**): 14
- i) What is promoter sequence ?
 - ii) Write a note on regulatory gene in operon.
 - iii) What are split genes ?
 - iv) What are introns ?
 - v) What are translational repressors ?
 - vi) What is TBP ?
 - vii) What is exon shuffling ?
 - viii) Write a note on polyribosomes.
 - ix) What are General Transcription Factors ?
3. A) Answer the following (**any 2**) : 10
- i) Explain RNA editing with suitable examples.
 - ii) Describe mechanism of intron splicing in eukaryotes.
 - iii) Describe regulation of translation in eukaryotes with suitable examples.
- B) Describe structure, function and assembly of prokaryotic RNA polymerase. 4
4. Answer **any two** of the following : 14
- i) Describe regulation of transcription in eukaryotes with any two suitable examples.
 - ii) Describe regulation of *trp* operon in bacteria.
 - iii) Explain post-translational modifications in proteins.
5. Answer **any two** of the following : 14
- i) Explain mechanism of translation in eukaryotes.
 - ii) Describe structure and regulation of lactose operon in bacteria.
 - iii) Describe mechanism of transcription in prokaryotes.



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**B.Sc. (Biotechnology) (Part – II) (Semester – IV) (New CBCS)
Examination, 2018
PLANT TISSUE CULTURE**

Day and Date : Monday, 10-12-2018
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

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

1. Choose **one** of the **correct** alternatives from the following : **14**

- 1) _____ was the first person to culture isolated, fully differentiated cells.
a) Murashige b) Cocking c) Skoog d) Haberlandt
- 2) The temperature of autoclave for sterilization of media is maintained at _____ °C for 20 min.
a) 37 b) 25 c) 121 d) 4
- 3) Culture of 'hairy roots' can be produced by transformation of legume plants with _____.
a) *Agrobacterium tumefaciens* b) *Agrobacterium rhizogenes*
c) *Bacillus thuringiensis* d) *Escherichia coli*
- 4) _____ is used for surface sterilization of explant.
a) Sterile water b) Sodium hypochlorite
c) Teepol d) Bavistin
- 5) Highest concentration of ethylene exists at the _____.
a) Growing tips of plants b) Leaves
c) In xylem d) Ripening stage of fruits
- 6) _____ culture technique is used for obtaining clonally propagated plants.
a) Micropropagation b) Callus
c) Anther d) Protoplast



2. Answer the following **(any seven)** : **14**
- 1) What is sterilization ? Give the methods for sterilization of glassware.
 - 2) What is surface disinfection ? Give an example of sterilant.
 - 3) Explain the levels of safety.
 - 4) Differentiate between embryo culture and embryogenesis.
 - 5) Explain the stages of plant hardening.
 - 6) What is an endosperm ? Give the importance of endosperm culture.
 - 7) Explain the scope of plant tissue culture.
 - 8) What is a cryoprotectant ? Give an example of it.
 - 9) Differentiate between hybrids and cybrids.
3. A) Answer the following **(any two)** : **10**
- 1) Discuss micropropagation.
 - 2) Explain of Somatic embryogenesis.
 - 3) Write an account on suspension culture.
- B) Explain General Plant Tissue Culture Laboratory design. **4**
4. Answer the following **(any two)** : **14**
- 1) Explain in detail about–isolation and culture of protoplast.
 - 2) Give a detailed account on plant tissue culture media.
 - 3) Explain in detail–different methods of cryopreservation.
5. Answer the following **(any two)** : **14**
- 1) Explain in brief-Somaclonal variation.
 - 2) Give a detailed account on somatic hybridization.
 - 3) Give a detailed account on callus culture.
-



2. Answer the following (**any seven**) : 14
- 1) Role of homogenizer in cell disruption.
 - 2) Enlist the advantages and limitations of lowry assay.
 - 3) How will you apply sample in GLC ?
 - 4) Principle of Bradford assay.
 - 5) Column used in column chromatography.
 - 6) Define blotting.
 - 7) Brief account on functional genomics.
 - 8) How will you carry out cell disruption by organic solvents ?
 - 9) Write a note on introduction of proteomics.
3. A) Answer the following (**any two**) : 10
- 1) Define chromatography and describe the descending paper chromatographic technique.
 - 2) Describe basic principle of electrophoresis.
 - 3) Describe assay used for iodine value.
- B) Discuss limitations of 2-D gel electrophoresis. 4
4. Answer the following (**any two**) : 14
- 1) In which electrophoretic technique proteins get separated by using pH gradient.
 - 2) Give details of carbohydrate estimation by DNSA method.
 - 3) Explain disc gel electrophoretic technique for protein.
5. Answer the following (**any two**) : 14
- 1) Describe Edman degradation for protein sequencing.
 - 2) Describe chromatographic technique which uses biological interaction between biomolecules for their separation.
 - 3) Explain DNA blotting technique.
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B.Sc. (Part – II) (Semester – IV) Examination, 2018
BIOTECHNOLOGY (New CBCS)
Mechanisms in Immunology

Day and Date : Wednesday, 12-12-2018
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

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

1. Rewrite the following sentences by choosing the **correct** alternative given below. **14**
- i) Eyelens protein is an example of _____
 - a) Hidden antigen
 - b) Isoantigen
 - c) Hapten
 - d) None of these
 - ii) BCG is an example of _____ vaccine.
 - a) Live attenuated
 - b) Subunit
 - c) Killed
 - d) Conjugate
 - iii) _____ is organ specific autoimmune disease.
 - a) Myasthenia gravis
 - b) Systemic lupus erythrematosus
 - c) Graves disease
 - d) None of these
 - iv) T cells are matured in _____
 - a) Bone marrow
 - b) Spleen
 - c) Thymus
 - d) Lymph node
 - v) _____ is primary mediator of anaphylaxis.
 - a) Histamine
 - b) Prostaglandins
 - c) Leukotrienes
 - d) Platelet activating factor
 - vi) _____ glycoprotein acts as antiviral agents that inhibit intracellular viral replication.
 - a) Lysozyme
 - b) Interferon
 - c) Fibronectin
 - d) Lactoferrin



- iv) Define atopy and anaphylaxis.
 - v) Define autoimmunity and hypersensitivity.
 - vi) Functions of T_H and T_C cells.
 - vii) Hemolytic diseases.
 - viii) NK cells.
 - ix) Factors affecting innate immunity.
3. A) Answer **any two** (out of three) of the following : **10**
- i) Physical barriers of innate immunity.
 - ii) Give difference between primary and secondary immune response.
 - iii) Explain any two organ specific autoimmune diseases.
- B) Explain ABO blood group system. **4**
4. Answer **any two** of the following : **14**
- i) Explain processing and presentation of exogenous antigen.
 - ii) Explain New trend vaccines with example.
 - iii) Explain General mechanism of autoimmunity (any 4 mechanism).
5. Answer **any two** of the following : **14**
- i) Explain B cell maturation, activation and differentiation.
 - ii) Explain classical complement pathway.
 - iii) Cellular mechanism of innate immunity.
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**B.Sc. – II Biotechnology (Semester – IV) (CBCS) Examination, 2018
METABOLISM (New)**

Day and Date : Thursday, 13-12-2018
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

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

1. Rewrite the following sentences by using **correct** alternative. **14**
- 1) Oxidation of malate to oxaloacetate by malate dehydrogenase, requires _____
a) ATP b) NADH c) FAD d) NAD
 - 2) Under aerobic conditions, pyruvate is converted to acetyl COA by _____
a) Hexokinase b) Pyruvate dehydrogenase
c) Aldosale d) Phosphoglycerate kinase
 - 3) Net ATP yield of glycolysis is _____ ATP molecules per molecule of glucose.
a) Two b) Three c) Four d) Six
 - 4) In eukaryotes, the citric acid cycle occurs in _____
a) Mitochondria b) Nucleus
c) Cytosol d) Endoplasmic reticulum
 - 5) Which of the following is both ketogenic and glucogenic amino acid ?
a) Valine b) Tryptophan
c) Lysine d) Inulin
 - 6) _____ is an example of uncoupler of ATP synthesis.
a) 2, 4 dinitrophenol b) DNSA
c) Tryptomycin d) IAA
 - 7) The long chain fatty acyl COA molecules are transported across mitochondrial membrane by conjugating with polar _____ molecule.
a) Chlorine b) Citruline
c) Phenylalanine d) Carnitine



- 8) The site for oxidative phosphorylation is _____ of mitochondria.
- a) Outer membrane b) inner membrane
c) Matrix d) Inter membrane space
- 9) De Novo purine nucleotide synthesis begins with _____
- a) PRPP b) PEP c) GAR d) FGAR
- 10) Transamination is the process where _____
- a) Carboxyl group is transferred from amino acid
b) Amino acid breakdown takes place
c) Amino acid synthesis takes place
d) Amino group is transferred from amino acid
- 11) In pentose phosphate pathway _____ is the monophosphate sugar used for shunting into other sugars.
- a) Fructose 6 phosphate
b) Glucose 6 phosphate
c) Sedoheptulose 7 phosphate
d) Erythrose 4 phosphate
- 12) Fatty acids are covalently linked with _____ carrier proteins during their synthesis.
- a) Methyl b) Ethyl c) Butyryl d) Acyl
- 13) The light reactions of photosynthesis occur in the _____
- a) Thylakoid membrane b) Stroma
c) Epidermis d) Cuticle
- 14) The nonprotein amino acid _____ acts as a carrier of amino and carbon atoms during urea cycle.
- a) Aminopteridine b) Butadiene
c) Ornithine d) Hypoxanthine



2. Answer the following (**any 7**) : **14**
- i) Write a note on reciprocal regulation of both glycolysis and gluconeogenesis.
 - ii) Define uncouplers with one example.
 - iii) Explain Rubisco's enzymatic activity.
 - iv) Write the reaction for activity of Glutamate transferase enzyme.
 - v) Which irreversible steps of glycolysis are bypassed in gluconeogenesis ?
 - vi) Draw the structure of ATP synthase enzyme.
 - vii) How fatty acids are transported into mitochondria during their breakdown ?
3. A) Answer the following (**any 2**) : **10**
- i) Explain reactions of non-oxidative phase of pentose phosphate pathway.
 - ii) Write a note on inhibitors of electron transport chain and ATP synthase complex.
 - iii) Write a note on location of photosynthesis and photosystem I and II.
- B) Explain sources of atom in purine biosynthesis. **4**
4. Answer **any two** of the following : **14**
- i) Add an account on biosynthesis of unsaturated of fatty acids.
 - ii) Write a note on catabolism of amino acids.
 - iii) Describe 'Calvin Cycle' of photosynthesis.
5. Answer **any two** of the following : **14**
- i) Write a note on transfer of electrons in respiratory chain with chemiosmotic coupling hypothesis.
 - ii) Explain metabolism of glycogen.
 - iii) Write a note on biosynthesis of pyrimidines.
-



- 7) Triplet code phenomenon was observed by F.H.C. Crick by using _____ dye.
a) Acridine b) Feuelgen c) Acetocarmine d) Evan's Blue
- 8) In photoreactivation the enzyme photolyase cleaves _____ dimers.
a) G-G b) C-C c) T-T d) A-A
- 9) _____ percent of Arginine and Lysine makes histone proteins basic.
a) 10%-20% b) 20%-30% c) 10%-30% d) 10%-25%
- 10) _____ enzyme catalyse the formation of negative super coils.
a) DNA polymerase b) DNA Helicase
c) DNA ligase d) DNA Gyrase
- 11) Mitochondrial DNA mutation leads to the decline of _____.
a) Glycolysis b) Photosynthesis
c) Gluconeogenesis d) Oxidative phosphorylation
- 12) Genes essential for all cell types are called _____.
a) Xist Gene b) Luxury Gene
c) House Keeping Genes d) Slave Gene
- 13) Rolling circle model of replication occurs in the *E.coli* chromosome during _____.
a) Transformation b) Conjugation
c) Transduction d) Replication
- 14) The antibiotic ciprofloxacin inhibits _____ enzyme.
a) Bacterial gyrase b) Bacterial polymerase
c) Bacterial ligase d) Bacterial Helicase

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

14

- 1) Define Tetranucleotide Hypothesis.
- 2) Define Bacteriophages.
- 3) Define Solenoid.
- 4) Define Chargaff's Rule.



- 5) Define Gene.
 - 6) Define Central dogma.
 - 7) Define Gene deserts.
 - 8) Define Linking Number.
 - 9) Define DNA Damage.
3. A) Attempt **any two** of the following : **10**
- 1) Explain about the molecular nature of Gene.
 - 2) Write about the salient features of double Helix of DNA with a neat labelled diagram.
 - 3) Write about Meselson and Stahl's Experiment of DNA Replication with neat labelled diagram.
- B) Explain in detail about Cot curve Analysis with neat labelled diagram. **4**
4. Attempt **any two** of the following : **14**
- 1) Describe in brief the organisation of DNA in Eukaryotes with a neat labelled diagram.
 - 2) Write in detail about the properties of Genetic Code.
 - 3) Describe in brief the Replication of DNA in Prokaryotes with a neat and labelled diagram.
5. Attempt **any two** of the following : **14**
- 1) Describe mismatch and Excision repair mechanism of DNA with a neat labelled diagram.
 - 2) Describe in detail DNA replication process in Eukaryotes with a neat labelled diagram.
 - 3) Write in detail about D-loop model of Replication in Mitochondria with a neat labelled diagram.
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B.Sc. – II (Biotechnology) (Semester – IV) (CGPA) (Old)
Examination, 2018
MOLECULAR BIOLOGY – II

Day and Date : Saturday, 8-12-2018
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

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

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

14

- 1) In eukaryotes, mRNA is synthesized by _____
 - a) RNA polymerase II
 - b) RNA polymerase III
 - c) RNA polymerase I
 - d) Poly 'A' polymerase
- 2) In eukaryotic transcription process _____ directly binds to TATA box of promoter.
 - a) TF-IIH
 - b) TF-IIID
 - c) TF-IIE
 - d) RNA polymerase II
- 3) During mRNA processing polyadenylation is carried out at _____ end of mRNA molecule.
 - a) Only at 5'
 - b) Both 5' and 3'
 - c) Only at 3'
 - d) None of these
- 4) Shine-Dalgarno sequences are _____
 - a) AGGAGGU
 - b) AGGUGGU
 - c) AGGAGGAU
 - d) UCCAUCC
- 5) In lac operon, β -galactosidase enzyme is encoded from _____ gene.
 - a) lac 'a'
 - b) lac 'b'
 - c) lac 'z'
 - d) lac 'y'



2. Answer the following (**any 7**) : **14**
- i) What is abortive transcription ?
 - ii) Write a note on Fidelity of translation.
 - iii) What is TFIID ?
 - iv) What are exon shuffling ?
 - v) What are informosomes ?
 - vi) What are transcriptional activators ?
 - vii) Write a note on mRNA transport.
 - viii) Write a note anti-termination.
 - ix) What are introns ?
3. A) Answer the following (**any 2**) : **10**
- i) Explain mechanism of translation in prokaryotes.
 - ii) Describe the process of alternative splicing mechanisms.
 - iii) Describe process of mRNA processing in eukaryotes.
- B) Explain Clover leaf model of tRNA. **4**
4. Answer **any two** of the following : **14**
- i) Explain post-translational modifications in proteins.
 - ii) Explain signal transduction in gene regulation with suitable examples.
 - iii) Describe process of transcription in eukaryotes.
5. Answer **any two** of the following : **14**
- i) Explain in detail regulation of lac operon in bacteria.
 - ii) Describe process of transcription in prokaryotes.
 - iii) Describe signal integration in gene regulation with suitable example.
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B.Sc. – II (Semester – IV) (Old CGPA) Examination, 2018
BIOTECHNOLOGY
Plant Tissue Culture

Day and Date : Monday, 10-12-2018

Total 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 labeled diagram wherever necessary.**

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

- i) Laminar air flow has a number of small blower motors to blow air which pass through a number of _____ filters.
a) HPLC b) HP-TLC c) HEPA d) NFT
- ii) Tissue culture room can be fumigated overnight and sterilized with _____
a) Potassium permanganate and formaldehyde
b) 70% ethanol
c) Steam
d) Oxygen
- iii) _____ vessels have been used in experiments with plant materials sensitive to gaseous build up within the culture vials.
a) Fluoro carbonate b) Polycarbonate
c) Polypropylene d) Metallic
- iv) _____ is a polysaccharide derived from certain algae and commonly used as a gelling agent in tissue culture media.
a) Sucrose b) Macronutrients
c) Micronutrients d) Agar



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

- i) Give a detailed account on – anther and pollen culture.
- ii) Explain in detail – somaclonal variation.
- iii) Discuss the methods of protoplast isolation and protoplast fusion.

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

- i) Write an account on different plant tissue culture media and add a note on media composition with significance and preparation.
 - ii) Write in detail about cryopreservation and its applications.
 - iii) Explain in detail about the plant regeneration through organogenesis with neat labeled diagram.
-



2. Answer the following (**any seven**) : 14
- 1) Write a note on substrate for cell growth.
 - 2) Write a note on CO₂ Incubator.
 - 3) Explain in brief criteria for subculture.
 - 4) Give brief account on complete media.
 - 5) Explain in brief cell counting.
 - 6) Write a note on cell separation.
 - 7) Enlist physiological properties of media.
 - 8) Write a note on type of product in production strategy.
 - 9) Write a note on cell determination by glucose.
3. A) Answer the following (**any two**) : 10
- 1) Explain analysis of cell cycle.
 - 2) Give details of warm trypsinization.
 - 3) Give details of cell synchronization.
- B) Write a note on history of ATC. 4
4. Answer the following (**any two**). 14
- 1) Describe in detail serum free media.
 - 2) Describe Instruments used in ATC.
 - 3) Discuss glycoprotein production from mammalian cells.
5. Answer the following (**any two**). 14
- 1) Discuss in detail cell counting and monitoring.
 - 2) Explain selection and maintenance of cell line.
 - 3) Explain production of blood clotting factors.
-



SLR-SJ – 37

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**B.Sc. – II (Biotechnology) (Semester – IV) (CGPA)
Examination, 2018
BIOENERGETICS AND ENZYMOLOGY (Old)**

Day and Date : Wednesday, 12-12-2018
Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

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

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

- 1) Half cells contain two ions of same element with different
 - a) Atomic mass
 - b) Oxidation state
 - c) Nucleon number
 - d) Electronic configuration
- 2) Negative electrode in half cell is made up of _____
 - a) Hydrogen
 - b) Zinc
 - c) Copper
 - d) Tungsten
- 3) The enzyme which forms the peptide bond is known as _____
 - a) Carbonic unhydrase
 - b) Peptidase
 - c) Carbohydrase
 - d) Peptidyl transferase
- 4) The catalytic efficiency of two distinct enzymes can be compared based on _____ factor.
 - a) Km
 - b) Product formation
 - c) Size of the enzymes
 - d) pH of optimum value
- 5) Inhibition of enzyme cytochrome oxidase by carbon monoxide is an example for
 - a) Feed back inhibition
 - b) Competitive inhibition
 - c) Non competitive inhibition
 - d) Uncompetitive

P.T.O.



- 6) In non-competitive inhibition extent of inhibition depends only on
- Concentration of enzyme
 - Concentration of substrate
 - Concentration of inhibitor
 - Concentration of ES complex
- 7) In uncompetitive inhibition inhibitor binds only to
- Enzyme
 - Substrate
 - ES-complex
 - Active site
- 8) When V and P values are constant in biochemical system $\Delta H =$
- ΔS
 - ΔT
 - ΔQ
 - ΔE
- 9) The number of isoenzyme forms of alcohol dehydrogenase in maize are _____
- 4
 - 8
 - 12
 - 16
- 10) The required pH for action of trypsin is _____
- 5
 - 6
 - 7
 - 8
- 11) A qualitative composition of product's molecule is completely identical to substrate's one, but the structure is different. Name the enzyme class.
- Isomerase
 - Hydrolase
 - Lyase
 - Ligase
- 12) Coenzyme carboxybiotin is the derivative of vitamin
- B1
 - B2
 - B3
 - B7
- 13) Inhibitor of succinate dehydrogenase is
- Sulfa drugs
 - Cyanides
 - Succinic acid
 - Malonic acid
- 14) Released kinetic energy by breakdown of enzymes is stored in bonds of ATP molecules in form of _____
- Potential energy
 - Kinetic energy
 - Hydra energy
 - Thermal energy



2. Answer the following (**any 7**) : **14**
- i) What is inhibitor give its one example ?
 - ii) Give two examples of coenzyme and prosthetic group.
 - iii) Define entropy and enthalpy.
 - iv) What is the significance of k_m and V_{max} ?
 - v) Define abzymes.
 - vi) What is the unit of enzyme activity and specific activity ?
 - vii) Draw the structure of ATP.
 - viii) Write a note on mass action ratio of reaction.
 - ix) Define cofactor with one example.
3. A) Answer the following (**any 2**) : **10**
- i) Explain first and second law of thermodynamics.
 - ii) Write a note on biological half reactions.
 - iii) How the substrate concentration affects the enzyme activity ?
- B) Explain concept of activation energy in enzyme catalysed reaction. **4**
4. Answer **any two** of the following : **14**
- i) Derive of Michaelis-Menten equation for single substrate.
 - ii) Explain relationship between equilibrium constant and standard free energy change.
 - iii) Write a note on classification system of enzyme with example of each class.
5. Answer **any two** of the following : **14**
- i) Write a note on types of enzyme inhibition with their kinetics.
 - ii) Explain regulation of enzyme in living system.
 - iii) Write a note on standard redox potential and free energy change.
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**B.Sc. – II Biotechnology (Semester – IV) (CGPA) Examination, 2018
METABOLISM (Old)**

Day and Date : Thursday, 13-12-2018

Total 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) Fatty acid with 14 carbons will undergo _____ cycles of beta oxidation.
a) 7 b) 6 c) 5 d) 4
 - 2) In eukaryotes fatty acid breakdown occurs in _____
a) Cytosole b) Mitochondrial matrix
c) Ribosome d) Endoplasmic reticulum
 - 3) _____ is not used for fatty acid biosynthesis.
a) Biotin b) NADPH
c) Bicarbonate d) Cyanocobalamine
 - 4) Urea and _____ are by product of urea cycle.
a) Aspartate b) Arginine
c) Ornithine d) Citrulline
 - 5) On transamination amino group from amino acid is collected in the form of _____
a) Aspartate b) Keto glutarate
c) Glutamate d) Keto acid



2. Answer the following (**any 7**) : 14
- i) Write a note on cori cycle.
 - ii) What is transamination ?
 - iii) Define gluconeogenesis.
 - iv) Write two examples of inhibitors of electron transport chain.
 - v) How the fatty acids are transported in mitochondria ?
 - vi) Write a note on Rubisco enzyme.
 - vii) Draw the structure of mitochondria.
 - viii) Write a note on lactic acid fermentation.
 - ix) Write down examples of ketogenic amino acids.
3. A) Answer the following (**any 2**): 10
- i) Write a note on ATP synthase complex and ATP generation in mitochondria.
 - ii) What are the sources of atoms in purine and pyrimidine molecules ?
 - iii) Explain β oxidation of saturated fatty acids.
- B) Write a note on starch synthesis in plants. 4
4. Answer **any two** of the following : 14
- i) Explain in detail components of electron transport chain and transfer of electron through this components.
 - ii) Write down the reactions involved in aerobic breakdown of glucose into pyruvate.
 - iii) How the biosynthesis of saturated and unsaturated fatty acid takes place ?
5. Answer **any two** of the following : 14
- i) Explain in detail CO_2 fixation reaction in C_3 plants.
 - ii) Write a note on urea cycle.
 - iii) Explain reactions and physiological significance of hexose monophosphate shunt.



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

1) Write an argumentative speech on ‘Smoking at Public Places’.

OR

2) Write a script of a debate on the topic- ‘Should Plastic Bags be Banned ?’
Use following points below to develop a debate. You can work in a group of four with two people choosing to argue for affirmative and two people arguing for the negative.

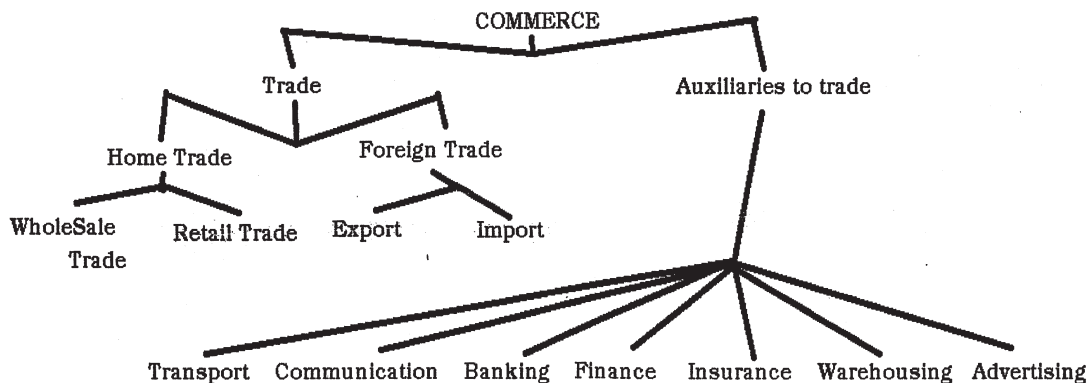
Affirmative :

- 1) Environmental damage
- 2) The Great Waste
- 3) Non-biodegradable
- 4) They litter our streets
- 5) Plastic bags suffocate and kill
- 6) Wildlife concerns
- 7) Spread Awareness.

Negative :

- 1) No need to ban, add a tax
- 2) Freedom of choice
- 3) People forget their re-useable bags
- 4) Causes loss of jobs
- 5) The environmental war needs to be won elsewhere
- 6) Loss of Technology
- 7) So what do we carry our shopping in ?
- 8) No need to ban just reduce the use of plastic.

5. Write a detailed paragraph on the following tree diagram.





2. A) Answer the following **(any four)**. 8
- 1) What is *in vitro* fertilization ?
 - 2) What is pollination ? Enlist vectors involved in pollination.
 - 3) Explain in brief seed technology.
 - 4) Differentiate between male and female gametophyte.
 - 5) Describe xylem tissue.
- B) Write notes on **(any two)**. 6
- 1) Why is *Arabidopsis thaliana* known as a Model of plant development ?
 - 2) Explain in brief – pollen germination.
 - 3) Write the storage proteins of endosperm and embryo.
3. A) Answer the following **(any two)**. 8
- 1) Discuss the methods of pollen storage.
 - 2) Discuss the classification of seeds on the presence or absence of endosperm.
 - 3) Explain the stages of embryo development.
- B) Answer the following **(any one)**. 6
- 1) Give a detailed account on root development.
 - 2) Give a detailed account on structure and synthesis of plant cell walls.
4. A) Answer the following **(any two)**. 10
- 1) Explain the mechanism of fertilization.
 - 2) Give a detailed account on polyembryony.
 - 3) Write the mode of action of different phytohormone.
- B) Answer the following **(any one)**. 4
- 1) Explain the concept of pollen embryos.
 - 2) Explain the concept of sporophytic and gametophytic self-incompatibility.
5. Answer the following **(any two)**. 14
- 1) Explain in detail – Development of female gametophyte.
 - 2) Give a detailed account on development of endosperm.
 - 3) Write a note on – biochemistry and molecular biology of fruit maturation.



- 5) The purification and recovery of the production after fermentation is called as _____ process.
- a) Upstream b) Downstream
c) Fermentation d) None of these
- 6) Stock culture maintained by _____
- a) Sterilization b) Lyophilization
c) Pasteurization d) Tyndalisation
- 7) Industrial production of citric acid is carried out using _____ microorganism.
- a) *Escherichia coli*
b) *Aspergillus niger*
c) *Saccharomyces cerevisiae*
d) *Acetobacter suboxydane*
- 8) _____ of the following is not used as antifoaming agent.
- a) Citric acid b) Vegetable oils
c) Lard oil d) Silicon derivatives
- 9) Solvent extraction is used for recovery of _____
- a) Penicillin b) Alcohol
c) Amylase d) Citric acid
- 10) In penicillin G production _____ is the precursor used.
- a) Phenyl acetic acid b) Alcohol
c) Vinegar d) Sodium chloride
- 11) Fermentation economics is based on _____
- a) Recovery b) Incubation period
c) Medium constituent d) All of these



- 12) _____ of fermentation process is always done before starting large scale operation of any fermentation.
- a) Scale up
 - b) Economics
 - c) Scale down
 - d) Screening
- 13) _____ substrate mainly used in amylase production.
- a) Malt
 - b) Peptone
 - c) Starch
 - d) Beef extract
- 14) The sterilization of heat sensitive material in fermentation industry is carried out by _____
- a) Centrifugation
 - b) Electrostatic precipitation
 - c) Heat
 - d) Filtration
2. A) Define and explain (**any four**) of the following : 8
- 1) Define fermentation.
 - 2) Culture Collection Centers for Microorganisms.
 - 3) Distillation.
 - 4) Biological assay.
 - 5) Precipitation.
- B) Write short note on **any two** of the following : 6
- 1) Write a note on anaerobic fermentation.
 - 2) Write a note on filtration.
 - 3) Write a note on inoculum preparation.
3. A) Answer **any two** of the following : 8
- 1) Write an essay on drying for product recovery.
 - 2) Explain in detail bioinsecticide production.
 - 3) Write in detail fermentation economics.
- B) Answer **any one** of the following : 6
- 1) Explain in detail primary screening.
 - 2) Write an essay on amylase fermentation.



4. A) Answer **any two** of the following : **10**
- 1) Explain in detail microbial growth kinetics.
 - 2) Write an essay on penicillin fermentation.
 - 3) Explain in detail sterilization of fermentation media.
- B) Answer **any one** of the following : **4**
- 1) Describe in detail batch fermentations.
 - 2) Give an account on computer applications in fermentation technology.
5. Answer **any two** of the following : **14**
- 1) Write an essay on Vitamin B12 fermentation.
 - 2) Write an essay on citric acid production.
 - 3) Discuss in detail different methods of strain improvement.
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**B.Sc. Biotechnology (Semester – V) (New CBCS) Examination, 2018
TOOLS AND TECHNIQUES**

Day and Date : Thursday, 22-11-2018

Total 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 and labeled diagrams.*

1. Rewrite the following sentences by choosing correct alternatives. **14**
- 1) Which is the technique suited for the separation of larger DNA fragments ?
a) PFGE b) AGE c) PAGE d) SDS-PAGE
 - 2) When is electrophoresis not used ?
a) Separation of proteins b) Separation of lipids
c) Separation of amino acids d) Separation of nucleic acids
 - 3) Which of the following factors does not influence electrophoretic mobility ?
a) Molecular weight b) Shape of molecule
c) Stereochemistry of molecule d) Size of molecule
 - 4) Which of the following statements is correct with respect to exonuclease ?
a) They only act on single stranded DNA molecules
b) They only act on double stranded DNA molecules
c) They remove nucleotide bases from the middle of polynucleotide chain
d) They remove a single nucleotide base at a time



- 5) Which of the following statements is correct regarding S1 nuclease ?
- a) It acts on single stranded DNA b) It acts on double stranded DNA
c) It acts on both types of strands d) It is obtained from E.coli
- 6) Type II cuts the sequence in the following way.
- a) At 100-1000 nucleotides away from the recognition sequence
b) Within the recognition sequence
c) At 27-30 nucleotides away from the recognition sequence
d) It cuts randomly
- 7) The most popular and widely used engineered plasmid vector is
- a) pSC 101 b) pUC 18
c) pBR 322 d) pBR 327
- 8) Autonomously Replicating Sequences (ARS) is characteristic feature of _____
- a) Plasmid vector b) Cosmid vector
c) Phage vector d) Yeast vector
- 9) Which of the following is not true about phagemids ?
- a) Can only propagated as phage
b) Contain λ att site
c) Contain functional Ori of plasmid & λ phage
d) May be propagated as a plasmid or as phage in appropriate strain
- 10) The ability of cells to take up DNA fragments from surrounding is called
- a) Transduction b) Transformation
c) Transfection d) Conjugation
- 11) Which of the following chemical enhances vir gene expression ?
- a) Cyanidin b) Glutennin
c) Acetosyringone d) Dextran



- 12) PCR is used in _____
- a) Site specific recombination
 - b) Site specific translocation
 - c) Site specific transformation
 - d) Site directed mutagenesis
- 13) DNA footprinting is a suitable technique for identifying _____
- a) Protein binding site within DNA
 - b) Introns within DNA
 - c) tRNA associated with DNA
 - d) mRNA associated with DNA
- 14) Alec Jeffery's name is associated with _____
- a) DNA sequencing
 - b) DNA fingerprinting
 - c) RNA sequencing
 - d) Protein fingerprinting

2. A) Answer the following (**any four**) : **8**

- 1) Give brief account on introduction of genetic engineering.
- 2) Define exonucleases and endonucleases.
- 3) Define Vectors.
- 4) Enlist the advantages and applications of electroporation.
- 5) Define probes.

B) Write notes on (**any two**) : **6**

- 1) Write a note on transformation.
- 2) Write a note on particle gun mediated gene transfer.
- 3) Write a note on synthetic oligonucleotide probes and riboprobes.

3. A) Answer the following (**any two**) : **8**

- 1) Give details of agarose gel electrophoresis.
- 2) Explain AMV reverse transcriptase.
- 3) Discuss shuttle vector.



- B) Answer the following (**any one**) : **6**
- 1) Describe chain termination method of DNA sequencing.
 - 2) Discuss DNA blotting technique.
4. A) Answer the following (**any two**) : **10**
- 1) Explain SDS-PAGE technique.
 - 2) Discuss reverse transcriptase PCR.
 - 3) Describe chemical methods used for direct DNA transfer.
- B) Answer the following (**any one**) : **4**
- 1) Describe DNA polymerase I.
 - 2) Explain nick translation and random primed method of labeling.
5. Answer the following (**any two**) : **14**
- 1) Describe in detail RFLP.
 - 2) Discuss in detail DNase I and Ribonuclease H.
 - 3) Explain p^{BR} 322 and p^{SC} 101 vector.
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B.Sc. – III (Semester – V) (Biotechnology) (New-CBCS) Examination, 2018
RECENT TRENDS IN BIOTECHNOLOGY

Day and Date : Saturday, 24-11-2018
Time : 2.30 p.m. to 5.00 p.m.

Total Marks : 70

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

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

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

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

1) Biodegradation of specific compounds by inoculating bacterial cell is known as _____.

- | | |
|----------------------|---------------------|
| a) Bioremediation | b) Bioaugmentation |
| c) Energy plantation | d) Phytoremediation |

2) _____ is the production of active pharmaceutical substances in genetically modified organisms.

- | | |
|------------------------|----------------------|
| a) Molecular pharming | b) Molecular biology |
| c) Genetic engineering | d) r-DNA technology |

3) The process of extracting metals from ore bearing rocks is called as _____

- | | |
|------------------|-------------------------|
| a) Bioextraction | b) Microbial extraction |
| c) Biofiltration | d) Bioleaching |

4) Stem cells are present in _____

- | | |
|--------------------------|----------------------------|
| a) Unicellular organisms | b) Multicellular organisms |
| c) Non-living thing | d) Viruses |

5) The selection of immobilization of cell or enzyme depends on _____

- | | |
|--|---------------------|
| a) Number of step in the process | b) Cost |
| c) Stability and catalytic specificity | d) All of the above |



- 6) For transformation of chloroplast of higher plants, a vector is used which doesn't _____ in the chloroplast.
- a) Replicates
 - b) Recombine
 - c) Include
 - d) Reduce
- 7) _____ means use of plants to remediate the soil contaminants.
- a) Phytoremediation
 - b) Bioaugmentation
 - c) Magnification
 - d) Clarification
- 8) _____ is an important water contaminant.
- a) Heavy metals
 - b) Carbon monoxide
 - c) Nitrogen oxide
 - d) Sulphur dioxide
- 9) _____ is not an objective of EIA.
- a) Risk analysis and disaster management
 - b) Assessment of international funding
 - c) Recycling and reduction of waste
 - d) All of the above
- 10) _____ bacterium is called as the superbug that could clean up oil spills.
- a) *Bacillus subtilis*
 - b) *Bacillus cereus*
 - c) *Pseudomonas putida*
 - d) *Escherichia coli*
- 11) Flux control coefficient measures the _____
- a) Steady state change
 - b) pH change
 - c) Temperature change
 - d) Hormonal change
- 12) The process of converting environmental pollutants into harmless products by naturally occurring microbes called _____
- a) Extrinsic bioremediation
 - b) Extreme bioremediation
 - c) Ex-situ bioremediation
 - d) Intrinsic bioremediation
- 13) Low molecular weight compounds cannot be immobilize by _____
- a) Covalent cross-linking
 - b) Microencapsulation
 - c) Adsorption
 - d) Entrapment
- 14) _____ is the practice of optimizing genetic and regulatory processes within cells to increase the cells' production of a certain substance.
- a) Genetic engineering
 - b) Gnotobiology
 - c) Metabolic engineering
 - d) Nanotechnology



2. A) Define and explain **any four** of the following. 8
- 1) Define Bioremediation.
 - 2) Edible vaccines.
 - 3) Stem cell.
 - 4) Bioaugmentation.
 - 5) Remote sensing.
- B) Write short note on **any two** of the following. 6
- 1) Clinical biotechnology.
 - 2) Limitations of metabolic engineering.
 - 3) Write a note on biofiltration.
3. A) Answer **any two** of the following. 8
- 1) Explain in detail components of EIA.
 - 2) Write an essay on analysis of metabolic network.
 - 3) Write in detail principles of clinical biochemical analysis.
- B) Answer **any one** of the following. 6
- 1) Write an essay on Methods of immobilizations.
 - 2) Write an essay on Sampling methods.
4. A) Answer **any two** of the following. 10
- 1) Write an essay on environmental monitoring.
 - 2) Write an essay on phytoremediation and wetland system.
 - 3) Explain in detail industrial applications of immobilization.
- B) Answer **any one** of the following. 4
- 1) Describe in detail importance of laboratory tests in clinical medicine.
 - 2) Give an account on cloning and over expression of heterologous genes.
5. Answer **any two** of the following : 14
- 1) Explain in detail Ex-situ and In-situ bioremediation.
 - 2) Explain in detail industrial waste biotreatment technologies.
 - 3) Discuss in detail integration of genetic engineering in agriculture.



- 6) Policies and protections made to ensure factory and its worker protection regarding hazards that could cause injury will be considered in _____
- a) industrial hygiene b) industrial quality
c) industrial safety d) industrial security
- 7) In the EPA OW stands for _____
- a) Office of Water b) Objectives of Water
c) Objections on Water d) Organization of Water
- 8) The sixth Director-General of the WTO is _____
- a) Dr. Margaret Chan b) Dr. Letitia Robinson
c) Francis Gurry d) Roberto Azevedo
- 9) Food safety and Standards Act was published by the parliament in _____
- a) 1995 b) 1999 c) 2003 d) 2006
- 10) Unsweetened, distilled, alcoholic drinks that have an alcohol content of at least 20% alcohol by volume are called _____
- a) beer b) spirits c) cider d) wine
- 11) Nanozyme have ability to mimic natural enzyme such as _____
- a) catalase b) peroxidase
c) both of these d) none of these
- 12) The Department of Biotechnology established in the year _____
- a) 1986 b) 1991 c) 2002 d) 2007
- 13) CSIR-Institute of Microbial Technology (CSIR-IMT) is located at _____
- a) Bhubaneswar b) Lucknow
c) Jorhat d) Chandigarh
- 14) Per year total 10 lakh research fellow grants are offered under _____
- a) Simons-NCBS b) PMRF
c) ICGEB d) iTHEMS-IKEN



2. A) Answer **any four** of the following : 8
- 1) Equipment cleaning 2
 - 2) Marketing. 2
 - 3) Ethics. 2
 - 4) Biosimilar. 2
 - 5) Research fellow. 2
- B) Write short note on **any two** of the following : 6
- 1) Medical coding. 3
 - 2) PMRF. 3
 - 3) ICAR. 3
3. A) Answer **any two** of the following : 8
- 1) Write in brief role and responsibilities of personnels in organization. 4
 - 2) Describe in brief structure and importance of SOP. 4
 - 3) Explain in brief role and responsibilities of WHO. 4
- B) Answer **any one** of the following. 6
- 1) Write an essay on DBT. 6
 - 2) Describe in detail plant tissue culture. 6
4. A) Answer **any two** of the following : 10
- 1) Explain in detail on New Zealand Commonwealth Scholarship Program. 5
 - 2) Describe in brief on production of biotherapeutic proteins and peptides. 5
 - 3) Give brief note on validation programs. 5
- B) Answer **any one** of the following : 4
- 1) Explain in brief production and applications of veterinary vaccines. 4
 - 2) Describe in brief various biotechnology based CSIR institutes. 4
5. Answer **any two** of the following : 14
- 1) Write an essay on GMP. 7
 - 2) Describe in detail upstream and downstream processing. 7
 - 3) Write in detail location, establishment, role and responsibility of ISO. 7



SLR-SJ – 47

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**B.Sc. – III (Semester – V) (Biotechnology) Examination, 2018
ENGLISH (Compulsory) (Old) (CGPA)
Breakthrough**

Day and Date : Saturday, 17-11-2018

Max. Marks : 70

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

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

1. A) Choose the correct alternative : 10
- 1) The opinions Shaw expresses in Church, School and Press prove that Shaw is a
 - a) Capitalist
 - b) Anarchist
 - c) Socialist
 - d) Populist
 - 2) According to G. B. Shaw, our society must be judged, not by its few _____, but by its millions of obedient subjects.
 - a) Patriots
 - b) Peasants
 - c) Journalists
 - d) Rebels
 - 3) The Gettysburg Address was delivered by Abraham Lincoln in
 - a) 1863
 - b) 1862
 - c) 1865
 - d) 1864
 - 4) Abraham Lincoln appeals to the people assembled at Gettysburg to strengthen
 - a) Aristocracy
 - b) Autocracy
 - c) Democracy
 - d) Both democracy and aristocracy
 - 5) In the poem “*Abou Ben Adhem*” an angel was writing in his golden book the names of
 - a) Those who loved God
 - b) Those who hated God
 - c) Those who were rich
 - d) Those who worked hard

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- 6) The poem “O Captain ! My Captain!” is written to mourn the death of
- a) Poet’s father
 - b) Abraham Lincoln
 - c) The captain of the ship
 - d) Poet’s brother
- 7) Which of the following statements about women is not true ?
- a) In the 19th Century women were encouraged to be an artist
 - b) Anonymity runs in the blood of women
 - c) A woman must have money and a room of her own if she is to write fiction
 - d) Even in the 19th century, women were slapped, lectured and exhorted
- 8) According to Virginia Woolf, chastity had then a _____ importance in a woman’s life.
- a) Political
 - b) Social
 - c) Economical
 - d) Religious
- 9) The poem *Abou Ben Adhem* was written by
- a) Lord Hunt
 - b) Leigh Hunt
 - c) Walt Whitman
 - d) Robert Browning
- 10) The captain does not answer because
- a) He is busy in his work
 - b) He is fast asleep
 - c) His lips are pale and still
 - d) He could not hear properly
- B) Rewrite the following sentences choosing the correct modal auxiliary from the brackets. 2
- 1) I _____ swim hours and hours. (can, could, may, should)
 - 2) _____ you please give me a lift up to the police station ? (would, must, might, shall)
- C) Write the following sentences in indirect speech. 2
- 1) Reema said to Kavita, “What are you doing ?”
 - 2) He said to us, “Let’s go home”.



2. Answer **any four** of the following questions : 16
- 1) What are Shaw's views on Press ?
 - 2) What does G. B. Shaw say about the corruption in the field of education ?
 - 3) Write a note on Abraham Lincoln's address to the people assembled at the Gettysburg.
 - 4) What are the principles on which the American democracy was founded ?
 - 5) How does society erode the talents of women writers ?
 - 6) What are the immaterial conditions of life that hinder women's talents as writers ?
3. Answer **any two** of the following : 12
- 1) Write a note on the appropriateness of the title of poem *O Captain ! My Captain !!*
 - 2) What did Abou Ben Adhem see in his dream ?
 - 3) Write a report on the send off ceremony of your class.
 - 4) Write a report on your visit to National Park.
4. Answer **any one** of the following : 14
- 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 "Child Sexual Abuse" using charts, transparencies or slides.
5. Write a transcript of group discussion on the topic "Lynching in India". 14
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**B.Sc. Biotechnology (Part – III) Semester – V (Old-CGPA)
Examination, 2018
PLANT DEVELOPMENT**

Day and Date : Monday, 19-11-2018
Time : 2.30 p.m. to 5.00 p.m.

Total Marks : 70

- Instructions :**
- 1) Figures to the **right** indicate **full** marks.
 - 2) Draw a neat, well labeled, **complete** diagram **wherever** necessary.
 - 3) **Use** of calculators, cell phones, or any other **electronic** gadgets is prohibited.
 - 4) **All** questions are **compulsory**.

1. Choose a **correct** alternative from the following :

14

- 1) The phenomenon of suppression of growth of an axillary bud in the presence of the terminal bud on the branch is known as _____
 - a) Lateral dominance
 - b) Apical dominance
 - c) Apical suppression
 - d) Apical meristem
- 2) In embryo development, a filament of 6-9 cells arising from basal cell is known as _____
 - a) Hypophysis
 - b) Epiphysis
 - c) Suspensor
 - d) Stock
- 3) _____ is the meristem that gives rise to epidermis.
 - a) Ground meristem
 - b) Procambium
 - c) Basal meristem
 - d) Protoderm
- 4) _____ is the fused product of two polar nuclei in the embryo sac.
 - a) Zygote
 - b) Pollen
 - c) Definitive nucleus
 - d) Antipodal
- 5) _____ is the type of endosperm formation in which the first division and several of the following divisions are accompanied by wall formation.
 - a) Helobial
 - b) Nuclear
 - c) Cellular
 - d) Acellular

P.T.O.



2. A) Answer the following **(Any Four)**. **8**
- 1) What is double fertilization ?
 - 2) Enlist the modes of pollination.
 - 3) What is embryogenesis ?
 - 4) Differentiate between diplospory and apospory.
 - 5) Describe xylem tissue.
- B) Write notes on **(Any Two)**. **6**
- 1) Why is *Arabidopsis thaliana* known as a model of plant development ?
 - 2) Explain in brief-pollen germination.
 - 3) Explain in brief-seed vernalization.
3. A) Answer the following **(Any Two)**. **8**
- 1) Discuss the methods of pollen storage.
 - 2) Discuss the classification of seeds on the presence or absence of endosperm.
 - 3) Explain the stages of embryo development.
- B) Answer the following **(Any One)**. **6**
- 1) Give a detailed account on root development.
 - 2) Give a detailed account on structure and synthesis of plant cell walls.
4. A) Answer the following **(Any Two)**. **10**
- 1) Explain the mechanism of fertilization.
 - 2) Give a detailed account on polyembryony.
 - 3) Give a general account of phytohormone.
- B) Answer the following **(Any One)**. **4**
- 1) Explain the concept of pollen embryos.
 - 2) Explain the concept of sporophytic and gametophytic self-incompatibility.
5. Answer the following **(Any Two)** **14**
- 1) Explain in detail-Development of female gametophyte.
 - 2) Give a detailed account on development of endosperm.
 - 3) Write a note on-biochemistry and molecular biology of fruit maturation.



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**B.Sc. III (Biotechnology) (Semester V) (Old - CGPA) Examination, 2018
ANIMAL DEVELOPMENT**

Day and Date : Tuesday, 20-11-2018
Time : 2.30 p.m. to 5.00 p.m.

Total Marks : 70

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

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

- 1) In, 1940 _____ proposed the Mosaic theory.
 - a) Weismann
 - b) Roux
 - c) Driesh
 - d) Child

- 2) Weismann recognized units of heredity as _____.
 - a) Genes
 - b) Determinants
 - c) Factors
 - d) All of these

- 3) Spermiogenesis means _____.
 - a) Conversion of spermatogonia into spermatids
 - b) Formation of spermatids
 - c) Conversion of spermatids into sperms
 - d) Formation of spermatogonia

- 4) Intertitial cells is also called as _____ cells.
 - a) Sertoli
 - b) Leydig
 - c) Sperm
 - d) Spermatogonial

- 5) Cortical granules contains _____.
 - a) Proteins
 - b) Acid mucopolysachharides
 - c) Lipids
 - d) Fatty acids and glycerol



- 6) Human eggs shows _____ type of cleavage.
- a) Incomplete
 - b) Partially complete
 - c) Complete
 - d) Meroblastic
- 7) Insect egg is an example of _____
- a) Centrolecithal
 - b) Telolecithal
 - c) Mesolecithal
 - d) Microlecithal
- 8) According to Gilchrist (1968), the prospective _____ is called “Zone of involution”.
- a) Ectodermal zone
 - b) Endodermal zone
 - c) Mesodermal zone
 - d) Notochordal zone
- 9) Development of an egg without fertilization is called as _____
- a) Parthenogenesis
 - b) Reproduction
 - c) Cloning
 - d) Metamorphosis
- 10) Spreading of malignant cells from primary site to distant sites is called as _____
- a) Metastasis
 - b) Morphogenesis
 - c) Metamorphosis
 - d) Organogenesis
- 11) _____ is an example of sexual reproduction.
- a) Conjugation
 - b) Binary fission
 - c) Gemmule formation
 - d) Budding
- 12) Age spots are result of an excess production of _____
- a) Hormone
 - b) Antioxidants
 - c) Melanin
 - d) Albumin
- 13) During metamorphosis cells are destroyed through process called _____
- a) Necrosis
 - b) Apoptosis
 - c) Cell quit
 - d) All of these
- 14) _____ is an example of anti-oncogene.
- a) p53
 - b) Rb
 - c) c-myc
 - d) both a and b



2. A) Answer the following questions (**any 4**). **8**
- i) What is gradient theory ?
 - ii) What are antioxidants ?
 - iii) What is polyspermy ?
 - iv) Write a note spermiogenesis.
 - v) Give structure of Graffian follicle.
- B) Answer the following questions (**any 2**). **6**
- i) Write properties of cleavage.
 - ii) Define invagination and involution.
 - iii) Hormonal control of spermatogenesis.
3. A) Answer the following questions (**any 2**). **8**
- i) Describe T.S. of ovary with neat labeled diagram.
 - ii) Describe regeneration in invertebrates with suitable example.
 - iii) Describe post-fertilization changes in egg cytoplasm.
- B) Answer the following (**any 1**). **6**
- 1) Describe blastulation in telolecithal egg with suitable example.
 - 2) Write a note on stem cells.
4. A) Answer the following questions (**any 2**). **10**
- i) Describe process acrosome reaction and cortical reaction.
 - ii) Explain different planes and types of cleavage with suitable examples.
 - iii) Describe metamorphosis in amphibians suitable examples.
- B) Answer the following (**any 1**). **4**
- 1) Explain free radical theory of aging.
 - 2) Describe process of gastrulation in frog with neat labeled diagram.
5. Answer **any two** of the following : **14**
- i) Describe different types of cancer with suitable examples.
 - ii) Describe process of gastrulation in chick with neat labeled diagram.
 - iii) Explain process of oogenesis with neat labeled diagram.
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**B.Sc. – III Biotechnology (Semester – V) (Old CGPA) Examination, 2018
BIOINFORMATICS AND NANOTECHNOLOGY**

Day and Date : Thursday, 22-11-2018
Time : 2.30 p.m. to 5.00 p.m.

Total Marks : 70

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

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

- 1) For antibacterial activity _____ nanoparticles are widely used.
 - a) Manganese
 - b) Cobalt
 - c) Silver
 - d) Molybdenum
- 2) The suitably modified polymeric nanoparticles in the form of _____ loaded with drugs are able to pass the blood brain barrier.
 - a) Liposomes
 - b) Fullerenes
 - c) Quantum dots
 - d) Nanotubes
- 3) The term nano was first coined by_____
 - a) Alexander Fleming
 - b) John Tyndall
 - c) Richard Fynmann
 - d) Rutherford
- 4) High energy ball milling is a _____ method of nanoparticle synthesis.
 - a) Physical
 - b) Chemical
 - c) Bilological
 - d) Natural
- 5) The _____ mechanism involves gathering of entities without any external influence.
 - a) Polymerization
 - b) Degradation
 - c) Isomerization
 - d) Self assembly
- 6) Nanoparticles are used in _____ therapy by placing a nanodot inside the body and illuminating it from outside.
 - a) Imaging
 - b) Chemo
 - c) Photodynamic
 - d) Natural



- 6) What are BLOSUM matrices ?
 - 7) What is the difference between top down and bottom up approach of nanomaterial synthesis ?
 - 8) What is SCOP database ?
 - 9) What are different nano size materials in human body ?
3. A) Answer **any two** of the following : **10**
- 1) Describe the primary protein sequence databases.
 - 2) Add a note on quantum idea and quantum mechanics.
 - 3) Add a note on polymerization of nanomaterials.
- B) Describe various applications of Bioinformatics. **4**
4. Answer **any two** of the following : **14**
- 1) Describe biological methods of nanomaterial synthesis.
 - 2) Describe tools for measurement of nanostructures.
 - 3) Describe various properties of nanostructures.
5. Answer **any two** of the following : **14**
- 1) What is structural database ? Explain any three Protein Structural Databases.
 - 2) What is biological database ? Explain nucleic acid sequence database.
 - 3) Add a detail account on 'NCBI'.
-



- 6) Environmental biotechnology involves _____
- a) The use of microbes to clean up the environment
 - b) Bioremediation
 - c) The study of benefits and hazards associated with GMM's
 - d) All of these
- 7) Bioethics is concerned with _____
- a) Healthcare law
 - b) Etiquette in medical facilities
 - c) The ethical implication of biological research methods and results
 - d) None of above
- 8) The dosage of chemical needed to produce death in 50 percent of the treated animal is _____
- a) LD50
 - b) MD50
 - c) MLD
 - d) LD30
- 9) The process of extracting metals from ore bearing rocks is called as _____
- a) Bioextraction
 - b) Bioleaching
 - c) Energy plantation
 - d) Biofiltration
- 10) Petroleum is a mixture of
- a) Sulfure and nitrogen
 - b) Hydrocarbons
 - c) Oxygen and water
 - d) Nitrogen and silver
- 11) The selection of immobilization of cell or enzyme depends on _____
- a) Number of step in the process
 - b) Cost
 - c) Stability and catalytic specificity
 - d) All of the above
- 12) Toxicants are absorbed by the body by
- a) Inhalation
 - b) Skin
 - c) Ingestion
 - d) All of these
- 13) Flux control coefficient measures the _____
- a) Steady state change
 - b) pH change
 - c) Temperature change
 - d) Hormonal change



- 14) _____ is the practice of optimizing genetic and regulatory processes within cells to increase the cell's production of a certain substance.
- a) Genetic engineering
 - b) Gnotobiology
 - c) Metabolic engineering
 - d) Nanotechnology
2. Answer **any seven** of the following : **14**
- 1) Solvent engineering.
 - 2) Define bioleaching.
 - 3) Bioethics.
 - 4) MCA.
 - 5) Enlist the industrial applications of enzyme engineering.
 - 6) Bioaugmentation.
 - 7) Enlist carriers used for enzyme immobilization.
 - 8) Define MLD.
 - 9) Applications of glucose oxidase.
3. A) Answer **any two** of the following : **10**
- 1) Explain the ethical issues of biodiversity.
 - 2) What is immobilization ? Give advantages and disadvantages of immobilized enzymes.
 - 3) Explain in detail the ethical issues of Human Genome Project.
- B) Describe in detail industrial wastewater biotreatment technologies. **4**
4. Answer **any two** of the following : **14**
- 1) Explain the role of organs involved in detoxification mechanism.
 - 2) Write in detail types of enzyme immobilization with its industrial applications.
 - 3) Define phytoremediation. Describe in detail phytoremediation for soil decontamination.
5. Answer **any two** of the following : **14**
- 1) Describe in brief site directed mutagenesis.
 - 2) Write an essay on analysis of metabolic network.
 - 3) Describe in detail types of Bioremediation and explain any one of them with suitable example.



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B.Sc. III (Biotechnology) (Semester – VI) (CGPA) Examination, 2018
ENGLISH COMPULSORY
(Breakthrough)

Day and Date : Monday, 29-10-2018
Time : 10.30 a.m. to 1.00 p.m.

Max. Marks : 70

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

1. Choose the correct answer from the alternatives given. 14
- 1) What task was Jim set by Aunt Polly ?
 - a) to whitewash the fence
 - b) to check on Tom's work
 - c) to bring the water from the town pump
 - d) to tend to his own business
 - 2) Ben Rogers was pretending to be
 - a) Aunt Polly
 - b) Billy Fisher
 - c) Big Missouri
 - d) Johnny Miller
 - 3) Tom gave the 'privilege' of whitewashing the fence when Ben offered him
 - a) the core of his apple
 - b) a bully law
 - c) half of his apple
 - d) the whole apple
 - 4) What did Loisel suggest Mathilde wear for ornamentation ?
 - a) flowers
 - b) diamonds
 - c) a necklace
 - d) fur wraps
 - 5) What change took place in Mathilde by the time she had repaid the loan ?
 - a) She had aged ten years
 - b) She became pale and thin
 - c) She had the look of a robust woman from a poor household
 - d) She looked young, still beautiful, still seductive
 - 6) Monsieur is a young middle class _____ in the Ministry of Education.
 - a) clerk
 - b) teacher
 - c) professor
 - d) driver
 - 7) Pyramus and Thisbe reside (live) in
 - a) Tomb of Ninus
 - b) Greece
 - c) Baby Ionia
 - d) Semiramins



- 8) Pyramus and Thisbe communicated through
- secret midnight meetings at the Tomb of Ninus
 - common friends
 - a crack in a wall
 - letters
- 9) On seeing _____ Pyramus assumed that Thisbe was dead.
- a crack in a wall
 - a bloody, torn veil
 - the white mulberry tree turned red
 - the footsteps of a lion in the sand
- 10) _____ sells tunics, mirrors and daggers in the poem 'In the Bazaars of Hyderabad.'
- The magicians
 - The gold smiths
 - The merchants
 - The flower sellers
- 11) In the poem The 'bright jewel' being addressed here is
- chastity
 - virtue
 - the speaker's soul
 - none of these
- 12) The tag question of "That is a great idea" is
- isn't that ?
 - is that ?
 - isn't it ?
 - isn't it
- 13) The girl knitted mittens while listening to a music CD the underlined clause is
- noun clause
 - an adverbial clause
 - a relative clause
 - an adjectival clause
- 14) It was raining, yet we went shopping. The sentence is
- simple sentence
 - complex sentence
 - compound sentence
 - none of these

2. Answer **any seven** of the following questions in short.

14

- How did Tom try to persuade Jim to help with his task and what was the result ?
- What task was Tom set by his aunt ?
- What did Tom acquire at the end of the day ?
- Why was Mathilde dissatisfied and unhappy ?
- How did Mathilde and Loisel replace the necklace ?
- Where did Pyramus and Thisbe decided to meet ?
- What happens to Thisbe before Pyramus arrives ?
- Where does Pyramus find Thisbe's Veil and what does he think ?

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3. A) Answer **any two** of the following questions. 8
- 1) Describe the scene of the bazaar in the poem of Sarojini Naidu. (In the Bazaars of Hyderabad).
 - 2) What is the theme of the poem 'On Virtue' ?
 - 3) What does the poet speak about life on earth in the poem 'on virtue' ?
- B) Answer **any two** of the following. 6
- 1) Write the important tips on time management.
 - 2) Imagine that you have recently been quarrelling a lot with a friend and want to make up your relationship with him/her better. Write six to eight sentences on how you would handle the problem.
 - 3) Describe briefly a difficult situation you found yourself in what did you do to adapt yourself to it.
4. A) Write a description of a person who sat opposite you on a train journey. Remember to use words to convey what the character, thoughts and mood of the person seemed to be. 14

OR

- B) Write a description of national hockey-player you watched at an interview programme on T.V. conducted by the TV anchor, by describing his personal qualities, attitude, speech etc.
5. Read the following passage and write **one-third** summary of it. 14
- 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.



- 13) YAC stands for
- a) Yeast Automated Chromosome
 - b) Yeast Artificial Clone
 - c) Yeast Artificial Chromosome
 - d) Yeast Automated Clone

- 14) Size of the pBR³²² is
- a) 4.1 kb
 - b) 4.66 kb
 - c) 4.362 kb
 - d) 4.22 kb

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

- 1) Write a note on scope of Genetic Engineering.
- 2) Define restriction endonucleases.
- 3) Give brief account on c-DNA probes.
- 4) Write a note on nucleic acid modifying enzymes.
- 5) Draw a neat and labeled diagram of shuttle vector.
- 6) Enlist the applications of RAPD.
- 7) Explain principle of autoradiography.
- 8) Explain cloning from genomic DNA.
- 9) Write a note on screening by nucleic acid probes.

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

- 1) Explain direct DNA transfer by using electroporation.
- 2) Describe bacteriophage vector.
- 3) Discuss agarose gel electrophoresis for DNA.

B) Explain in short DNA transfer by Transduction. **4**



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

- 1) Describe in detail AFLP as molecular marker.
- 2) Give details of RNA polymerases.
- 3) Discuss in detail chromosome walking.

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

- 1) Give details of automated DNA sequencing.
 - 2) Discuss PCR and enlist its applications.
 - 3) Explain yeast vectors.
-



- 5) Explain in brief synthesis of human growth hormone.
 - 6) Enlist the applications of transgenic animals.
 - 7) Write a note on gene therapy for cystic fibrosis.
 - 8) Write a note on increase in activity of enzyme.
 - 9) Write a note on interfering RNA.
3. A) Answer the following (**any two**) : **10**
- 1) Explain antisense RNA as therapeutic agent.
 - 2) Explain cloning livestock by nuclear transfer.
 - 3) Write a note on edible vaccines.
- B) Explain synthesis of human interferon. **4**
4. Answer the following (**any two**) : **14**
- 1) Discuss salt stress tolerant plants.
 - 2) Give details of commercial production of fructose and alcohol.
 - 3) Discuss vector vaccines directed against viruses.
5. Answer the following (**any two**) : **14**
- 1) Describe in detail transgenic mice.
 - 2) How will you engineered a xanthomonas for xanthan gum production.
 - 3) Explain development of senescence tolerant plants.
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B.Sc. (Part – III) (Semester – VI) (CGPA) Examination, 2018
BIOTECHNOLOGY
Fermentation Technology

Day and Date : Thursday, 1-11-2018
Time : 10.30 a. m. to 1.00 p. m.

Max. Marks : 70

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 :

14

- 1) Chemically well defined fermentation media is called as _____
 - a) Synthetic media
 - b) Waste as a raw material
 - c) Living media
 - d) Semi synthetic media
- 2) The production of substances in industrial microbiology occurs in the sequence _____
 - a) fermentation, downstream processing, removal of waste, inoculation
 - b) Inoculation, downstream processing, fermentation, removal of waste
 - c) Inoculation, fermentation, downstream processing, removal of waste
 - d) Removal of waste, inoculation, fermentation, downstream processing
- 3) Detection and isolation of industrial important microorganisms from soil is called as _____
 - a) assay
 - b) primary screening
 - c) fermentation
 - d) none of these
- 4) _____ technique is used for selection of auxotrophic mutants.
 - a) Alkali
 - b) Acid
 - c) Alcohol
 - d) Penicillin
- 5) Enzymes are separated from fermented broth by _____ technique.
 - a) centrifugation
 - b) solvent recovery
 - c) filtration
 - d) none of these



- 5) Define inoculum preparation.
 - 6) Culture collection units.
 - 7) Crowded plate technique.
 - 8) Primary screening of acid producers.
 - 9) Aeration and agitation.
3. A) Answer **any two** of the following : **10**
- 1) Write on design and characteristics of an ideal fermentor.
 - 2) Fermentation economics.
 - 3) Application of computer in fermentation technology.
- B) Write an essay on citric acid fermentation. **4**
4. Answer **any two** of the following : **14**
- 1) Explain in detail Microbial growth kinetics in continuous culture.
 - 2) Strain improvement by mutation.
 - 3) Write an account on different methods of filtration and centrifugation used for purification of fermented broth.
5. Answer **any two** of the following : **14**
- 1) Explain biological assays.
 - 2) Preservation and maintenance of industrial strains.
 - 3) Give an account on types of Fermentation media.
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B.Sc. – III (Semester – VI) (CGPA) Examination, 2018
BIOTECHNOLOGY
Food and Dairy Technology

Day and Date : Friday, 2-11-2018
Time : 10.30 a. m. to 1.00 p. m.

Max. Marks : 70

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

1. Choose the correct alternative and rewrite the sentence again : **14**
- i) Available water or water activity (a_w) is decreased using _____
a) pasteurization b) drying c) filtration d) canning
- ii) Indian pickles are preserved due to _____
a) hypertonic condition b) hypotonic condition
c) isotonic condition d) isoelectric point
- iii) _____ has been called the 'Father of Canning'.
a) Pasteur b) Robert Hook
c) Tyndall d) Nicolas Appert
- iv) The cow milk contain _____ % of lactose sugar generally.
a) 2 b) 3 c) 4 d) 5
- v) The cow milk contain _____ % of casein protein generally.
a) 1.5 b) 2.5 c) 3.5 d) 4.5
- vi) Pasteurization is the process of _____
a) sterilization b) drying c) disinfection d) vaccination
- vii) Milk's Phosphate test is used to determine the _____
a) quality of milk
b) efficiency of pasteurization
c) quantity of milk
d) lactose in milk



- vii) Disinfection
 - viii) Spoilage of food
 - ix) Pickles.
3. A) Answer **any two** of the following : **10**
- i) Explain genetic and immunological methods used for determination of food spoilage by toxins and microbes.
 - ii) Explain microbial spoilage of eggs and poultry products.
 - iii) Explain quality systems with examples in food industry.
- B) Define pasteurization and explain methods of pasteurization. **4**
4. Answer **any two** of the following : **14**
- i) Explain dye reduction tests in detail with its significance.
 - ii) Explain the production, spoilage, preservation and nutritional value of Vinegar.
 - iii) Explain the general methods of food preservation.
5. Answer **any two** of the following : **14**
- i) Explain Hazard Analysis and Critical Control Points (CACCP) system in detail.
 - ii) Explain the production, spoilage, preservation and nutritional value of Cheese.
 - iii) Explain microbial spoilage of vegetables and fruits.
-