



UNIVERSITY OF THE PUNJAB

B.A. / B.Sc. Part – II

Annual Examination – 2019

Subject: Botany-II
PAPER: A (Cell Biology, Genetics and Evolution)

MAX. TIME: 30 Min.
MAX. MARKS: 14

Roll No. in Fig.

Roll No. in Words.

Signature of Supdt.

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q. 1. Fill in the blanks (8 marks)

Please fill in the blanks with appropriate terms/words

- i. The highly branched polysaccharide that stores glucose in the muscle and the liver of animals is _____.
- ii. The matrix / inner liquid portion in chloroplast is known as _____.
- iii. The linear arrangement of amino acids in the polypeptide chain is referred to as the _____ structure of the protein.
- iv. The condition termed as _____, when an organism is having two complete set of chromosomes.
- v. The protoplasts from two different plants are made to fuse together, producing _____ cell.
- vi. In genetics, _____ is a chromosomal aberration caused by rearrangement of parts between non-homologous chromosome.
- vii. _____ is the source of new allele
- viii. There is _____ on tRNA corresponding to each codon on mRNA.
- ix. Heterochromatin remains condensed during _____.
- x. Triacylglycerides are made up of _____ and fatty acids.
- xi. The viruses which infect bacterial cells are known as _____.
- xii. _____ are the monomers of proteins, which is a polymeric molecule.
- xiii. Interphase of cell cycle consists of G1-stage, _____ and G2- stage.
- xiv. _____ is the study of fossils.
- xv. The total variety of genes and alleles present in a population is called _____.
- xvi. Theory of evolution by natural selection proposed by _____.

Q. 2. True or False statements (3 marks)

Please select true or false statement by encircling 'T' or 'F' as appropriate

- | | | |
|---------------------------------------------------------------------------|---|---|
| i. Recessive allele can express itself only in homozygous condition. | T | F |
| ii. Maltose is a milk sugar found in milk of mammals | T | F |
| iii. The bacteria that can grow on minimal medium are called auxotroph | T | F |
| iv. Vacuoles are double membranous organelle | T | F |
| v. Cell division enables an increase in size and complexity of plant body | T | F |
| vi. Evolution is a sort of change which occurs in tens of years. | T | F |

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MAX. TIME: 2 Hrs. 30 Min.

MAX. MARKS: 21

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

NOTE: Attempt any THREE questions. All questions carry equal marks. Draw neat and labeled diagrams along with captions where necessary. (3 x 7=21 Marks)

- Q.4
- a) Name three structural components of chloroplast. 3
 - b) Write general formula of an amino acid. 2
 - c) What is the difference between gene and allele? 2
- Q.5
- a) Give briefly four salient points of Darwin's theory of Natural selection. 4
 - b) Give any three functions of cell membranes. 3
- Q.6
- a) Simply introduce methods of bacterial recombination. 3
 - b) What are four types of chromosomes on the base of centromere position. 4
- Q.7
- a) Differentiate between followings. 4
 - i. Rough and smooth endoplasmic reticulum.
 - ii. Codon and anti-Codon.
 - b) Name any three enzymes used *in vivo* DNA replication. 3
- Q.8
- a) Define four levels of proteins structure. 4
 - b) Differentiate between RNA and DNA. 3



UNIVERSITY OF THE PUNJAB
B.A. / B.Sc. Part – II (Special Re-Conduct)
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MAX. MARKS: 21

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NOTE: Attempt any THREE questions. All questions carry equal marks. Draw neat and labeled diagrams along with captions where necessary. (3 x 7=21 Marks)

- Q.4 a) Write names of four components of a eukaryotic nucleus 4
b) Give any three uses of PCR 3
- Q.5 a) How Meselson & Stahl proved semiconservative DNA Model of replication? 4
b) Briefly write functions of three types of plastids 3
- Q.6 a) Write a note on transduction 3
b) Write a note on fluid mosaic model of plasma membrane 4
- Q.7 a) Differentiate between followings: 4
i. Monohybrid vs. dihybrid cross
ii. Test vs. back cross
b) Describe artificial selection 3
- Q.8 a) Explain Lamarck's Theory of Evolution. 4
b) Name three functions of cell membranes 3



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Q. 1. Fill in the blanks (8 marks)

Please fill in the blanks with appropriate terms/words

- i. The fraction of protoplasm in between cell membrane and nuclear membrane is called _____.
- ii. The molecules that contain carbon are _____ compounds.
- iii. The next stage after G1-stage during cell cycle is _____ stage.
- iv. The condition termed as _____, when an organism gains or loses one or more complete set of chromosomes.
- v. The linked genes are located on _____ chromosome.
- vi. The two most popular types of vectors are plasmid and _____.
- vii. Each functional ribosome is composed of _____ subunits.
- viii. Hybrid is having new type of phenotype in _____ dominance.
- ix. The plasma membrane commonly known as _____ membrane.
- x. The subunits of any polymer are called _____.
- xi. The euploids may be monploids, diploids and _____.
- xii. Mendel worked on total _____ contrasting characters in pea plants.
- xiii. _____ are mostly responsible for cellular secretions.
- xiv. Euchromatin becomes uncoiled/uncondensed during _____.
- xv. The reversal of mutation to original or wild form is called _____ mutation.
- xvi. _____ is the study of fossils.

Q. 2. True or False statements (3 marks)

Please select true or false statement by encircling 'T' or 'F' as appropriate

- | | | |
|------------------------------------------------------------------------------|---|---|
| i. Polygenic inheritance is when traits are influenced by more than one gene | T | F |
| ii. The inheritance of acquired characters proposed by Lamarck | T | F |
| iii. Vacuole is a self-replicating organelle | T | F |
| iv. ATP is required for transport of molecules by passive transport | T | F |
| v. Cell divisions do not cause increase in size and complexity of plant body | T | F |
| vi. Linked genes can be separated by crossing over. | T | F |

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Q. 1. Fill in the blanks (8 marks)

Please fill in the blanks with appropriate terms/words

- i. _____ is a monomer of cellulose.
- ii. The fraction of protoplasm in between cell membrane and nuclear membrane is called _____.
- iii. The chromatin material consists of DNA and _____ proteins.
- iv. The function assigned to the ribosomes is the synthesis of _____.
- v. During _____ of cell cycle the DNA molecules are actually duplicated.
- vi. The condition termed as _____, when an organism gains or loses one or more chromosomes, but not a complete set.
- vii. Linked genes can be separated by _____.
- viii. The selection of organisms (crops etc.) based on human desire are called _____.
- ix. The _____ bonds hold the base pairs of DNA together.
- x. The members of the colony that share the single genetic ancestor are known as _____.
- xi. The two most popular types of vectors are _____ and viruses.
- xii. The inversions involve the _____ positioning of genes relative to other genes.
- xiii. Mendel worked on total _____ contrasting characters in pea plants.
- xiv. _____ are known as proteins synthesizing factories.
- xv. There is a specific *aminoacyl synthetase* enzyme for each _____.
- xvi. There is an only one start signal but _____ stop signals.

Q. 2. True or False statements (3 marks)

Please select true or false statement by encircling 'T' or 'F' as appropriate

- | | | |
|-------------------------------------------------------------------------------|---|---|
| i. Chloroplast does not have its own DNA. | T | F |
| ii. Genetic drift is change in allele frequency that results simply by chance | T | F |
| iii. The seed bank preserves dried seed by storing them at a high temperature | T | F |
| iv. The BT gene codes for protein toxic that specifically kills pest larvae | T | F |
| v. ATP is required for transport of molecules by passive transport | T | F |
| vi. Cell division enables an increase in size and complexity of plant body | T | F |

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NOTE: Attempt any THREE questions. All questions carry equal marks. Draw neat and labeled diagrams along with captions where necessary. (3 x 7=21 Marks)

- Q.4
- a) Name three structural components of chloroplast. 3
 - b) Write formula of triacylglycerol. 2
 - c) Differentiate between a test cross and a back cross. 2
- Q.5
- a) Give any four advantages of selective breeding 4
 - b) Give any three causes of mutations. 3
- Q.6
- a) Simply introduce methods of bacterial recombination 3
 - b) What are four different types of chromosomal aberration? effecting chromosomes structure wise? 4
- Q.7
- a) Differentiate between Monohybrid and Dihybrid crosses. 4
 - b) Give three examples of globular proteins. 3
- Q.8
- a) Give briefly four salient points of Darwin's theory of natural selection 4
 - b) Give any three practical uses of Genetic Engineering 3



UNIVERSITY OF THE PUNJAB

B.A. / B.Sc. Part – II

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Subject: Botany-II

PAPER: B (Physiology and Ecology)

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MAX. MARKS: 14

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Q 1. Fill in the blanks with appropriate terms/words

05 Marks

1. Amylase activity is increased in the presence of _____ ions.
2. The wind transported parent material is termed _____.
3. The percentage of moisture when the drainage of a wetted soil slows down is called its _____.
4. The principle buffer in blood is _____ buffer.
5. The water molecules exhibit mutual force of attraction due to presence of hydrogen bonds. This is called _____.
6. _____ light intensity promotes transpiration.
7. The excess trios-P (3-PGald) is used for _____ synthesis within the chloroplast or sucrose synthesis in the cytosol.
8. Mangrove forests replace _____ marches in tropical regions and support a rich fauna.
9. At about pH 7 the starch is converted to _____.
10. The organelle perceiving the stimulus was called _____.

Q 2. Select true or false statement by encircling 'T' or 'F'

05 Marks

- | | | |
|---------------------------------------------------------------------------------------------------------|---|---|
| 1. Organic matter of the soil has neutral charged surfaces. | T | F |
| 2. The matric potential is a measure of the tendency for a matrix to absorb additional water molecules. | T | F |
| 3. Natural ecosystems depend upon wind energy entirely. | T | F |
| 4. Epinasty is induced by ethylene and low concentration of auxin. | T | F |
| 5. The removal of water by hydrophilic surfaces is called hydration. | T | F |
| 6. The site of vernalization is the growing point. | T | F |
| 7. The long-short day plants flower in early summer or early fall. | T | F |
| 8. Hard seed coat is common in members of Leguminosae. | T | F |
| 9. The colloidal particles are large enough to be seen with naked eye. | T | F |
| 10. Proton pumps are the main electrogenic pumps of plants. | T | F |

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Subject: Botany-II
PAPER: B (Physiology and Ecology)

MAX. TIME: 2 Hrs. 30 Min.
MAX. MARKS: 21

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NOTE: Attempt any THREE questions. All questions carry equal marks. Draw neat and labeled diagrams along with captions where necessary. (3 x 7=21 Marks)

- Q 4. a) Describe the role of Auxins in various developmental phenomena in plants. 4
b) What is soil organic matter and its importance? 3
- Q 5. a) What is respiration? Discuss its efficiency as an energy releasing process. 3
b) Differentiate between 4
i. Water Potential and Osmotic Potential
ii. Soil structure and Soil texture
- Q 6. a) Explain the cohesion-tension theory of ascent of water in plants. What objections were raised on it? 4
b) Write a note on Nastic movements. 3
- Q 7. a) What is the importance of light, water and temperature for plant growth and distribution? 4
b) Write a note on buffers and their biological significance. 3
- Q 8. a) What is the importance of precipitation to plants? Also give the names of their types. 3
b) Give a brief account of Krebs cycle. Illustrate with help of sketch. 4



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- Q2. a) What are Colloids? Describe their Nature and Biological significance. 3
b) Write note on 4
i). Climax Vegetation ii). Methods of seed dispersal
- Q3. a) Describe different steps involved in Calvin Cycle. 3
b) What is Plant Succession? Describe Xerosere in detail. 3
c) What is Local Vegetation? 1
- Q4. a) Define Transpiration. Describe mechanism of opening and closing of stomata and their role in Transpiration. 5
b) Write note on Soil Organisms. 2
- Q5. a) What are Growth Regulators and Growth Inhibitors? Describe role of Cytokinins and ABA on plant growth. 4
b) What are the causes of Water Logging in Pakistan? 2
c) Draw Water Cycle. 1
- Q6. a) Define Dormancy. What are the causes of Seed Dormancy? 3
b) Write a note on Ecological Pyramids. 2
c) Differentiate between Soil Structure and Soil Texture. 2



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Q1. Attempt All the Following Parts of Question

A. Fill in the Blanks with appropriate terms/words.

(8 Marks)

1. The term _____ is defined as "the negative logarithm of the hydrogen ion concentration.
2. When the turgor pressure equals the osmotic potential of a solution; the water potential of that solution equals to _____.
3. About _____ % of the total transpiration is cuticular.
4. After nitrogen and phosphorus, soils are usually most deficient in _____.
5. Starch is broken down by enzyme amylase, therefore _____ is the substrate.
6. The Krebs cycle takes place in the matrix of _____.
7. _____ is the first plant hormone to be discovered.
8. Garner and Allard called *Maryland mammoth* a _____ day plant.
9. Fermentation is a sequential series of reactions that occurs in the absence of _____.
10. _____ is the study of a group of different populations associated together as a community.
11. The _____ horizon is the surface layer composed of fresh or partially decomposed organic matter.
12. The plants that grow best at low light intensity are known as _____.
13. Removal of soil from one part to another usually down hill, by the action of water is known as _____.
14. Precipitation (rainfall, snowfall) is the major source of soil _____.
15. The transfer of food energy from the source in plants through a series of organisms with repeated eating and being eaten is referred to as the _____.
16. The study of population dynamics is called _____.

P.T.O.

B. True or False Statements**(3 Marks)***Please select true or false statement by encircling 'T' or 'F' as appropriate*

- | | | |
|------------------------------------------------------------------------------------------|----------|----------|
| 1. The colloidal systems with the property of fluidity is called gel. | T | F |
| 2. The concentration of sucrose ranges from 0.3 to 0.9 M in phloem. | T | F |
| 3. Coenzymes are usually not loosely held to the enzymes. | T | F |
| 4. Humus acts as buffer and helps in maintaining a uniform pH. | T | F |
| 5. ESP is exchangeable sodium percentage. | T | F |
| 6. A series of aquatic communities that develop in a bare land body is called hydrosere. | T | F |

C. Multiple Choice Questions**(3 Marks)***Please Encircle the Appropriate Letter (a, b, c or d) of the Correct Answer*

- The negative logarithm of the hydrogen ion concentration is
 - pH
 - TCE
 - buffer
 - acid
- Which one of the enzyme is for break down of cellulose
 - ligases
 - cellulases
 - amylases
 - non of these
- How many ATP are produced during break down of glucose
 - 34
 - 36
 - 38
 - 40
- The partial decomposition of plant material is called
 - litter
 - humus
 - duff
 - all of these
- The removal of soil by the action of air is called
 - water erosion
 - soil formation
 - wind erosion
 - both a&b
- The root nodules bacteria fix _____ in soil from air
 - nitrogen
 - phosphorous
 - sulpher
 - iron