

Time: 15 Minutes**Max. Marks: 08****SECTION "A" MULTIPLE CHOICE QUESTION**

1. Choose the correct answer for each from the given options:
- (i) Crossing over takes place during this stage:
• Leptotene • Zygotene • Pachytens • Diplojene
- (ii) Only this one of the following is a topographic factor of an ecosystem:
• Earthsurface • Temperature • Water • Fire
- (iii) The sea below 2000 meters having no light is called:
• Abyssal zone • Euphotic zone
• Benthic zone • Neretic zone
- (iv) Exosmosis takes place if a cell is placed in:
• Hypotonic solution • Isotonic solution
• Equitonic solution • Hypertonic solution
- (v) Plants, infected with disease, produce these chemical substances:
• Photoreceptors • Chemoreceptors
• Phytoalexins • Heat-shock proteins
- (vi) Indole acetic acid is the name of:
• Cytokinin • Auxin • Gibberellin • Abscissic acid
- (vii) Catkin inflorescence is observe in:
• Zinnia • Mulberry • Grasses • Rose
- (viii) Messenger RNA triplets are called:
• Subcodon • Codon • Anticodon • Decodon
- (ix) Scientific study of soil is called:
• Geography • Pedology • Topography • Geology
- (x) Plants of intertidal zone of sea produce a jelly-like substance called:
• cellulose • agar • pectin • lysogen
- (xi) Multiple effect of a single gene is called:
• Pleiotropy • Heleiotropy • Epistasis • Epinastic
- (xii) This biome is called the breadbasket of the world
• Tundra • Savannah • Grassland • Tropical rainforest
- (xiii) The attachment point of two chromatids of a chromosome is called:
• Centromere • Kinetochore • Chromonema • Chromomere
- (xiv) At low temperature, ice crystals are formed in:
• Mitochondria • Nucleus • Ribosome • Cell wall
- (xv) All are chemical messengers except:
• Biorhythms • Phytohormones • Growth regulators • Hormones
- (xvi) This hormone helps in the closing of stomata:
• Cytokinin • Ethane • Abscissic acid • Gibberell

BOTANY

2019

Time: 1 hours 45 Minutes

Max. Marks: 32

SECTION 'B' (SHORT-ANSWER QUESTIONS (20))

NOTE: Answer 10 questions from this question:

- I. Name any two aspects of Homeostasis.
- II. Write any two advantages of Secondary tissues.
- III. Define Pollination. Name its types.
- IV. Name the kinds of Cymose inflorescence
- V. What is meant by Double fertilization?
- VI. Draw Karyotype of Drosophila.
- VII. Name different types of Cell division.
- VIII. Name various types of plants on the basis of relative requirement of light
- IX. Name the horizontal zones of sea.
- X. How can we estimate the age of a tree?
- XI. Mention any two functions of Auxin.
- XII. Differentiate between isogamy and Oogamy.
- XIII. Name various nitrogenous bases found in DNA nucleotides.
- XIV. Which cross helps to determine the homozygosity or heterozygosity of a dominant parent?
- XV. Name the two main types of movements in plants.

3. Attempt any five-part question.

- I. Explain the responses of plants against herbivory.
- II. Define Succession. Name its various types.
- III. Classify Chromosomes on the basis of position of centromere.
- IV. Discuss advantages & disadvantages of Transpiration.
- V. Write note on any one of the following:
 - i. Seed dormancy
 - (ii) Vernalization
- VI. How is Apoptosis different from Necrosis?
- VII. Compare Mitosis with Meiosis.
- VIII. Write note on any one:
 - i. Desert ecosystem
 - ii. 4 forests of Pakistan.

SECTION "C" (DETAILED-ANSWER QUESTIONS

NOTE: Answer 2 question from this section (12)

4. Describe Watson & Crick model of DNA. How does this model explain semi-conservative replication of DNA?
5. Define sex-linked inheritance. Explain with reference to hemophilia in man.

6. What do you mean by Biogeochemical cycle? Describe Nitrogen cycle. OR Define Meiotic errors. Describe the defects caused due to abnormal number of chromosomes in human beings.

BOTANY

2018

Time: 15 Minutes

Max. Marks: 08

SECTION "A" MULTIPLE CHOICE QUESTION

1. Choose the correct answer for each from the given options:

i. The production of a pond ecosystem are:

- Phytoplankton
- Capparid
- Zooplankton
- Prosopis

ii. A type of orderly or programmed cell-death is:

- Leukemia
- Apoptosis
- Terminalization
- Necrosis

iii. In epigeal germination cotyledons are carried above the soil due to rapid growth of:

- Radicle
- Hypocotyl
- Plumule
- Epicotyl

iv. Promotion of flowering by cold treatment to the imbibed seeds is called:

- Vivipary
- Vernalization
- Garner
- Lysenko

v. Germination of seed within the fruit while still attached to the plant is:

- Epigeal
- Hypogeal
- viviparous
- oviparous

vi Movement unrelated to the direction of diffused stimuli is:

- nastic movement
- turgor movement
- nutational movement
- Curvature movement

vii. When the growth of the main axis stops, due to a flower on tip, the inflorescence is called:

- Cymose
- Racemose
- Corymb
- Catkin

viii. Both polynucleotide strands of DNA remain separated by: •

- 5 Å
- 10 Å
- 15 Å
- 20 Å

ix. Information from DNA regarding the amino acid sequence of a protein is copied into:

- mRNA
- rRNA
- tRNA
- ribosome

x. The tendency of genes located on the same chromosome to inherit together is called:

- crossing over
- co-dominance
- incomplete dominance
- linkage

xi. The result of F₁ generation for colour blindness of a carrier female is crossed with a normal male will be:

- son 25% colour blind, daughter 25% carrier
- 50% diseased, 50% carrier
- all carrier
- all colour blind

xii. The term ecosystem was first introduced in 1935 by:

- Tansley
- Ernest Inghel
- Charles Darwin
- de Vries

xiii. Crossing over takes place during:

- leptotene
- Zygotene
- pachytene
- diplotene

xiv. Exudation of water by hydathodes is:

- Pollination
- Guttation
- Transpiration
- Transpiration

BOTANY

2018

Time: 1 hours 45 Minutes

Max. Marks: 32

SECTION 'B' (SHORT-ANSWER QUESTIONS (20))

NOTE: Answer 10 questions from this question:

- Define Paratonic movement.
 - What do you mean by Double fertilization?
 - Name various Meristematic tissues found in plants.
 - Define Karyotype.
 - Name only the biotic factors of an ecosystem.
 - How Halophytes cope with in salt marshes?
 - Define any one:
 - Incomplete dominance
 - Co-dominance
 - Give names of Racemose in florescence having elongated Axis.
 - Name polygenic traits in human, plants and animals.
 - Define test cross.
 - State the role of Pollen tube.
 - Define Deletion, Duplication, Translocation & inversion.
 - When do you find Mitotic and Meiotic cell divisions in plant?
 - Define Photoperiodism.
 - Explain Apical meristem.
- Attempt any five-part question.
 - Mention how plants respond to Drought stress?
 - Find the possible blood group of children if the blood group of father is O and that the mother is AB.
 - What is an autosome? How many Autosomes are there in a human cell?
 - What is Down's syndrome?
 - Define succession and name its various types.
 - Write a note on Phenylketonuria.
 - Define Biological Clock and Circadian Rhythm.
 - Write a note on Sclerenchyma.

SECTION “C” (DETAILED-ANSWER QUESTIONS)

NOTE: Answer 2 question from this section (12)

4. Define the term Ecosystem. Name the various abiotic components of an ecosystem. Describe climatic factors only.
5. What are Phytohormones? Name various Phytohormones and discuss the role of Auxins.
6. Describe Prophase-I of Meiosis with diagrams.
OR Describe the Law of Independent Assortment with the help of checker board.

CBSE

BOTANY

Time: 15 Minutes

2017

Max. Marks: 08

SECTION "A" (MULTIPLE-CHOICE QUESTIONS)

1. Choose the correct answer for each from the given options:

- (i) Appearance of Intermediate characters in alleles in generate is called:
- Incomplete dominance
 - Co-dominance
 - Test cross
 - Multiple alleles
- (ii) One gene-one enzyme hypothesis was given by:
- Griffith
 - T.H. Morgan
 - Chase
 - Bendle and Tatum
- (iii) For their defence, infected plants produce a variety of these chemical compounds:
- Phytoalexin
 - Phytochrome
 - Phytoplankton
 - Phytohormone
- (iv) Germination occurring in constal plants is called:
- Epigeal
 - Vivipary
 - Parthenocarp
 - Hypogeak
- (v) Fibres and sclereids are this type tissues:
- Parenchyma
 - Sclerenchyme
 - Collenchyma
 - Stele
- (vi) This is present in RNA but not DNA:
- Adenine
 - Guanine
 - Cytosine
 - Uracil
- (vii) Plant hormone responsible for ripening of fruits is:
- Auxin
 - Ethene
 - Cytokinin
 - Gibberellin
- (viii) Above 40°C plant cells synthesize relatively large amounts of special proteins called:
- Tubulin
 - Heat-shock
 - Cold-shock

- d. Ice-shock
- (ix) Plants, having both staminate and carpellate flowers, are called:
 - a. Monoecious
 - b. Dioecious
 - c. Female
 - d. Male

CBSE

- (x) A permanent alternation in the DNA sequence is called:
- Crossing over
 - Zygotene
 - Mutation
 - Linkage
- (xi) The pairing of homologous chromosomes during Meiosis is called:
- Mitosis
 - Amitosis
 - Synapsos
 - Apoptosis
- (xii) The total aggregate of genes in a population at any I time is called:
- Multiple alleles
 - Dominant alleles
 - Genes pool
 - Recessive allele
- (xiii) The cross fertilization of a phenotypically dominant individual with a homozygous recessive is called:
- Back-cross
 - Test-cross
 - Monohybrid-cross
 - Dihybrid-cross
- (xiv) The gradual process by which ecosystems change and develop over time is:
- Succession
 - Climate
 - Niche
 - Synapsis
- (xv) In this process strong winds cause deep, oceanic cold water to rise towards the surface:
- Up-welling
 - Respiration
 - Autecology
 - Ecology
- (xvi) Each chromosome is attached to spindle fibre through:
- Centriole
 - Aster
 - Kinetochores
 - Cell plate

BOTANY

Time: 1 Hours 45 Minutes

**2017
Marks: 32**

SECTION 'B' (SHORT-ANSWER QUESTIONS)(20)

NOTE: Answer 10 questions from this section.

- What do you understand by the term Hydathode?
- Give any two salient features at Gymnosperm life cycle
- Name the components of DNA.
- Name the scientists known for the following discoveries.
 - Ladder type organization of DNA.
 - One gene-one enzyme hypothesis.
- Differentiate between leptotene and zygotene.
- Define Allele.

- (vii) Draw a flow chart for ecological level of organization.
 - (viii) How many types of decomposer exist in an ecosystem?
 - (ix) Name the different type of Abiotic components of Ecosystem.
 - (x) What will be the result of a cross between Haemophilia male and Normal female?
 - (xi) Describe the function of Absciscic acid OR Ethane gas.
 - (xii) Give definition of Gene pool or Creasing over.
 - (xiii) Name various aspects of Homeostasis.
 - (xiv) State the law of independent Assortment.
 - (xv) Write only the names of different kinds of Asexual reproduction.
3. Attempt any five part questions.
- (i) What are Annual rings?
 - (ii) Write five roles of Austin.
 - (iii) Write note on photoperiodism OR Vernalization
 - (iv) State coniferous forests of Pakistan
 - (v) Describe three substages of Interphase
 - (vi) Give cross b/w Red-eyed female and White-eyed male in drosophila.
 - (vii) Define Meristem and Mention its types OR Differentiate between DNA and RNA.
 - (viii) Write note on Genetic code.

SECTION 'C' (DETAILED-ANSWER QUESTIONS)

NOTE: Answer 2 question from this section (12)

- 4. Prove with the help of experiment that DNA is a genetic material. OR Explain Watson and Crick model of DNA and write its replication.
- 5. What is ecological succession? Describe various seral stages of Hydrosere.
- 6. Write Human defect disorder caused due to abnormal number of Chromosomes.

BOTANY

Time: 15 Minutes

2016

Max. Marks: 08

SECTION "A" (MULTIPLE-CHOICE QUESTIONS)

1. Choose the correct answer for each from the given options:

- (i) Sex determination in *Drosophila* was initially observed by:
- T.H. Morgan
 - Mendel
 - Watson
 - Darwin
- (ii) Protein synthesis starts with this codon:
- UAG
 - UAA
 - UGA
 - AUG
- (iii) The tendency of genes in a chromosome to remain together is called:
- Epistasis
 - Linkage
 - Pleiotropy
 - Synapsis
- (iv) Chromosomal theory of heredity was proposed by:
- Watson
 - Griffith
 - Walter Sutton
 - Chase
- (v) It is a defect in humans in which blood fails to clot after an external or internal injury:
- Sickle cell anemia
 - Phenylketonuria
 - Haemophilia
 - Colour blindness
- (vi) The cotyledon in monocot seed is called:
- Scutellum
 - Integument
 - Coleorhiza
 - Coleoptile
- (vii) In plants, the process of mitosis is:
- Amphi-astral
 - An-astral
 - Multi-astral
 - Di-astral
- (viii) In Turner's syndrome, the condition of chromosome is the example of:
- Monosomic
 - Nullisomic
 - Trisomic
 - Allosomic
- (ix) The total aggregate of genes in a population at any time is called:
- Gene pool
 - Linkage
 - Crossing over
 - Genome

- (x) The correct sequence of sub-stages during interphase is:
- G1G2S
 - SG1G2
 - G1SG2
 - G2G1S
- (xi) This Biome is called 'the Bread Basket' of the world:
- Savannah
 - Grassland
 - Desert
 - Tundra
- (xii) The net movement of water molecular remains in equilibrium, when a cell is placed in:
- Hypotonic solution
 - Hypertonic solution
 - Isotonic solution
 - None of these
- (xiii) These are found in the soil of high salt concentration:
- Hydrophytes
 - Mesosphytes
 - Halophytes
 - Xerophytes
- (xiv) Promotion of flowering by cold treatment is called:
- Apormixia
 - Photoperiodism
 - Vernalization
 - Phototropism
- (xv) Increase in diameter of a plant due to activity of vascular and cork cambium is called:
- Primary growth
 - Secondary growth
 - Abnormal growth
 - Tertiary growth
- (xvi) This bacterium lives in the root nodules of leguminous plants:
- Rhizobium
 - Clostridium
 - Cyanobacterium
 - Azotobactor

BOTANY

Time: 1 Hours 45 Minutes

**2016
Marks: 32**

SECTION 'B' (SHORT-ANSWER QUESTIONS)(20)

NOTE: Answer 10 questions from this section.

- Differentiate any one of the following:
 - DNA and RNA
 - Autosomes & Sex-chromosomes
- Draw graphically the levels of Organization.
- Define Cytokinin OR Gibberellin
- Define Germination. Describe its various types.
- Differentiate between Transpiration and Guttation.
- Write a note on Sclerenchyma tissue.
- Define vernalization OR photoperiodism
- Write a note on Phenylketonuria OR Alkaptonuria.

- (ix) Draw a chart showing phenotype and Genotype of different Blood groups
- (x) Write the Edaphic factors of Ecosystem
- (xi) Write a note on ONE of the following:
- Tundra
 - Grassland
 - Coniferous Forest
- (xii) A colour blind woman is married to a normal man. How many children of this couple are likely to be colour blind in \square_2 generation?
- (xiii) Write a note on Genetic Code
- (xiv) Write a note on the significance of Secondary Growth.
- (xv) State the Law of segregation with phenotypic ratio and genotypic ratio.

SECTION 'C' (DETAILED-ANSWER QUESTIONS)

NOTE: Answer 2 question from this section (12)

- 3.(i) Define Meiosis. Explain the various stages of Prophase-1 of Meiosis.
- (ii) Define Chromosomes. Describe with diagram the chemical composition of Chromosomes and their ultra-structure.
- (iii) Describe the Law of Independent Assortment. Explain it with the help of checker board method.

OR

What is upwelling? Describe the marine life in various zones of the sea.

BOTANY

Time: 15 Minutes

2015

Max. Marks: 08

SECTION "A" (MULTIPLE-CHOICE QUESTIONS)

1. Choose the correct answer for each from the given options:

- (i) The study of Earth's surface texture is termed:
- Topographic factor
 - Edaphic factor
 - Climatic factor
 - Biotic factor
- (ii) Double fertilization is the characteristics of:
- Bryophytes
 - Gymnosperms
 - Pteridophytes
 - Angiosperms
- (iii) The formation of mRNA from DNA in the nucleus is called:
- Transformation
 - Transcription
 - Transduction
 - Conjugation
- (iv) The diameter of stem and root increases due to:
- Intercalary meristem
 - Lateral meristem
 - Sciophytes
 - Hydrophytes
- (v) Plants growing in shade are termed:
- Halophytes
 - Heliophytes
 - Sciophytes
 - Hydrophytes
- (vi) The running water rivers, springs and streams is called:
- Lentic
 - Estuary
 - Niche
 - Lotic
- (vii) The particular array of chromosomes present in a individual is called:
- Autosome
 - Genotype
 - Karyotype
 - Phenotype
- (viii) Bivalents are formed at this shape:
- Zygotene
 - Pachytene
 - Dipoltene
 - Diakinesis
- (ix) Organisms responsible for recycling of minerals within an ecosystems are called:
- Producers
 - Primary consumers
 - Secondary consumers
 - Decomposers

- (x) A cell having 16 chromosomes, divides by meiosis. At telophase-I, the number of chromosomes in each nucleus will be:
- 08
 - 16
 - 24
 - 32
- (xi) A type of programmed cell death is:
- Apoptosis
 - Synapsis
 - Necrosis
 - Diakinesis
- (xii) During cell division, when homologous chromosomes fail to separate properly, the phenomenon is called:
- Non-disjunction
 - Polyploidy
 - Euploidy
 - Pleiotropy
- (xiii) Chromosomes normally occur as homologous pair in a/an:
- Sperm cell
 - Egg cell
 - Zygote
 - Gamete
- (xiv) This hormone acts as growth inhibitors causing stomata to close:
- Cytokinin
 - Gibberellin
 - Abscissic acid
 - Ethene
- (xv) The plant cells that have cell walls removed are called:
- Protoplasts
 - Protoplasm
 - Cytoplasm
 - Tonoplasts
- (xvi) Cells found at the stem and root apices are termed:
- Cambium
 - Lateral meristem
 - Intercalary meristem
 - Apical meristem

BOTANY

Time: 1 Hours 45 Minutes

**2015
Marks: 32**

SECTION 'B' (SHORT-ANSWER QUESTIONS)(20)

NOTE: Answer 10 questions from this section.

- What is the role of Auxins in plants?
- Write a note on natural methods of Asexual reproduction in plants.
- Explain chromosomal aberration
- Differentiate Mitosis and Meiosis
- Describe test cross of incomplete dominance.
- Describe the types of RNA
- Why did Mendel choose pea plant as an experimental material?
- What adaptations do plants make to cope with the effects of hot and cold temperatures?

- (ix) Write a note on Excretion in plants.
- (x) Describe Desert ecosystems with reference to Pakistan.
- (xi) What is syndrome? Describe the effects of XXY Trisomic condition in humans.
- (xii) Write a note on Light as a climatic factor.
- (xiii) Define Interphase. Name and explain its sub-stages.
- (xiv) Define Meristem. Give the types of Meristems and state their functions.
- (xv) Write a note on any one of the following:
 - a. Growth correlation
 - b. Seed dormancy

SECTION 'C' (DETAILED-ANSWER QUESTIONS)

NOTE: Answer 2 question from this section (12)

3.(i) Describe Watson and Cricks Model of DNA. How does DNA replicates semi-conservatively.

(ii) What is movement in plants? Describe various types of para tonic movements in plants.

OR Describe various components of Pond ecosystem

(iii) Describe various stages of Mitotic Cell division.

OR Define Sex-linked inheritance. Discuss Sex-Linked inheritance in humans.

BOTANY

Time: 15 Minutes

2014

Max. Marks: 08

SECTION "A" (MULTIPLE-CHOICE QUESTIONS)

1. Choose the correct answer for each from the given options:

- (i) The sea below 2000 meters having no light is called:
- Benthic Zone
 - Abyssal Zone
 - Euphotic Zone
 - Neretic Zone
- (ii) Water moves In or Out of a living cell by the process of:
- Plasmolysis
 - Osmosis
 - Guttation
 - Imbibition
- (iii) Growth movement of plants in response to touch stimulus is called:
- Chemotropism
 - Geotropism
 - Thigotropism
 - Hydrotropism
- (iv) In Bryophytes, growth takes place at:
- Apices
 - Lateral region
 - In the centre
 - Throughout the body
- (v) Mendel performed his famous experiment of heredity on:
- Maize
 - Pea
 - Bean
 - Gram
- (vi) The total aggregate of genes in a population at any one time is called:
- Gene pool
 - Linkage
 - Crossing over
 - Genome
- (vii) Down's syndrome is an example of this condition:
- Trisomic
 - Monosomic
 - Nullisomic
 - None of these
- (viii) One complete turn of DNA contains:
- 2 nucleotides
 - 5 nucleotides
 - 10 nucleotides
 - 20 nucleotides
- (ix) For synthesis of protein, cells use:
- DNA
 - Nucleus
 - RNA
 - Chromosomes

- (x) The concentration of oxygen in an atmosphere is about:
- 21%
 - 50%
 - 30%
 - 60%
- (xi) Producers of a pond ecosystem are:
- Bacteria
 - Zooplankton
 - Phytoplankton
 - Fungi
- (xii) These are capable of cell division:
- Mature cells
 - Meristematic cells
 - Permanent
 - Parenchyma
- (xiii) Increase in diameter of a plant due to the activity of vascular and cork cambium is called:
- Primary growth
 - Secondary growth
 - Primary & Secondary growth
 - None of these
- (xiv) Plant hormone responsible for apical dominance is:
- Auxin
 - Gibberellin
 - Cytokinin
 - Ethane
- (xv) Cells found at the stem and root apices are termed are:
- Apical meristem
 - Intercalary meristem
 - Lateral meristem
 - Cambium
- (xvi) The study of living things in relation to its environment is called:
- Community
 - Ecosystem
 - Ecology
 - Succession

BOTANY

Time: 1 Hours 45 Minutes

2014

Marks: 32

SECTION 'B' (SHORT-ANSWER QUESTIONS)(20)

NOTE: Answer 10 questions from this section.

- 2.(i) Describe any two phases of Growth OR Draw L.S of stem and root spices showing different growing zones.
- (ii) Differentiate between DNA and RNA.
- (iii) A colour blind woman marries a normal man. How many children of this couple are likely to be colour blind in \square_2 generation.
- (iv) Draw graphically the level of organization.
- (v) Write a note on Biotic components of Pond Ecosystem.
- (vi) Describe Coniferous of Temperate deciduous forests of Pakistan.
- (vii) Draw a chart showing seven pairs of contrasting characters observed by Mendel. Also mention which of these characters are dominant or recessive.

- (viii) Write a note on Neritic region of ocean.
- (ix) What is a Test Cross? Explain with example.
- (x) Write a note on Sickle cell anemia or Vernalization.
- (xi) State four points of Chromosomal theory of heredity.
- (xii) Write a note on the significance of Secondary growth.
- (xiii) Write a note on the role of Growth hormones in plant movement.
- (xiv) Write a note on any ONE of the following:
 - a. Cymose inflorescence
 - b. Tissue culture
- (xv) Explain why interphase is not a resting phase of cell cycle.

SECTION 'C' (DETAILED-ANSWER QUESTIONS)

NOTE: Answer 2 question from this section (12)

3.(i) State the Law of Independent Assortment. Explain it with the help of checker board method.

(ii) What is Ecological succession? Describe Hydrosere.

OR How do male and female gametophytes of argiospermic plants develop from anthers and ovaries respectively?

(iii) Draw and describe Prophase I of Meiotic division.

OR Describe the process of Gene expression.

BOTANY

Time: 15 Minutes

2013

Max. Marks: 08

SECTION "A" (MULTIPLE-CHOICE QUESTIONS)

1. Choose the correct answer for each from the given options:

- (i) Promotion of flowering by cold treatment is called:
- Apomixis
 - Photoperiodism
 - Vernalization
 - Phototropism
- (ii) The correct sequence of sub-stages during interphase is
- ₁₂
 - ₁₂
 - ₁₂
 - ₂₁
- (iii) This bacterium is found in the root nodules of leguminous plants:
- Azotobacter
 - Clostridium
 - Rhizobium
 - Cyanobacterium
- (iv) Diabetes is caused due to the deficiency of:
- Thyroxin
 - Pepsin
 - Insulin
 - Bile
- (v) Programmed cell death is:
- Apoptosis
 - Phagocytosis
 - Necrosis
 - Pinocytosis
- (vi) The plants living in fresh water are termed as:
- Mesophytes
 - Halophytes
 - Hydrophytes
 - Xerophytes
- (vii) Above 40°C, plant cell starts synthesizing:
- Lipid
 - Enzyme
 - Hormone
 - Heat shock protein
- (viii) Dark zone of oceanic region is:
- Euphotic
 - Aphotic
 - Abysal
 - Bathyal
- (ix) In the stem secondary growth is caused due to the activity of:
- Cambium
 - Xylem
 - Phloem
 - Pith

- (x) Each chromosome is attached to the spindle fibre with the help of:
- Centriole
 - Aster
 - Cell plate
 - Kinetochores
- (xi) This biome is called the bread basket of the world:
- Savannah
 - Grassland
 - Desert
 - Tundra
- (xii) Ecosystem having lotic water is called:
- Pond
 - Swamp
 - River
 - Tundra
- (xiii) Exudation of water by hydathode is:
- Transpiration
 - Excretion
 - Guttation
 - Respiration
- (xiv) Naturally occurring cytokinin is:
- Zeatin
 - Kinetin
 - Ethene
 - Auxin
- (xv) The cotyledon of maize is:
- Integument
 - Coleoptile
 - Coleorhiza
 - Scutellum
- (xvi) The number of bases of genetic code used to specify code used to specify an amino acid is:
- One
 - Two
 - Three
 - Four

BOTANY

Time: 1 Hours 45 Minutes

2013
Marks: 32

SECTION 'B' (SHORT-ANSWER QUESTIONS)(20)

NOTE: Answer 10 questions from this section.

- Describe Biological clock and Circadian system in plant.
- Write a note on Sclerenchyma tissues.
- Differentiate between Mitosis and Meiosis.
- Draw a chart showing genotypes and phenotypes of different Blood Groups.
- Write a note on positive or negative interaction in Organisms.
- Write a note on Co-dominance or incomplete dominance
- Write a note on Chromosomal aberration.
- Describe natural methods of Asexual Reproduction in plants.
- Write a note on any one of the following Ecosystem
 - Savannah

- b. Tundra
- c. Coniferous forests
- (x) Define Photoperiodism.
- (xi) What are tropic movements? Name different types of tropic movements.
- (xii) Draw a chart showing different zones in the sea.
- (xiii) What is Gibberellin? Give its role.
- (xiv) Define various types of RNA.
- (xv) Write a note on Genetic Code.

SECTION 'C' (DETAILED-ANSWER QUESTIONS)

NOTE: Answer 2 question from this section (12)

- 3.(i) Write a note on different approaches used for Ecological investigation.
 - (ii) Describe Watson and Crick model of DNA and its replication.
 - (iii) What are phytohormones? Give names of different types of hormones. Describe only two types of hormones.
- OR** Discuss Sex-Linked inheritance in humans.

BOTANY

Time: 15 Minutes

2012

Max. Marks: 08

SECTION "A" (MULTIPLE-CHOICE QUESTIONS)

1. Choose the correct answer for each from the given options:

- (i) In grasses, intercalary meristem occurs:
- At the base of internodes
 - Below the node
 - At the tip of the shoot
 - At the tip of the root
- (ii) At this meiotic prophase-I sub stage, terminalization takes place:
- Diakinesis
 - Zygotene
 - Diplojene
 - Leptotene
- (iii) Plants growing in shade are known as:
- Heliophytes
 - Mesophytes
 - Halophytes
 - Sclophytes
- (iv) In this type of germination, the seed germinations inside the fruit while still attached to the parent plant and nourished by it:
- Hypogeal germination
 - Epigeal germination
 - Viviparous germination
 - Parthenocarp
- (v) Protein synthesis starts with this codon:
- UAG
 - UAA
 - UGA
 - AUG
- (vi) The dept of oceanic zone where light reaches is called:
- Euphotic
 - Aphotic
 - Bathyal
 - Abyssal
- (vii) For their defense, infected plants produces a variety of chemical compounds:
- Phytochrome
 - Phytohormone
 - Phytoalexin
 - Phytoplankton
- (viii) This is a type of orderly or programmed cell death:
- Necrosis
 - Synapsis
 - Mitosis
 - Apoptosis
- (ix) It is a defect in humans in which blood fails to clot after an external injury:
- Phenylketonuria
 - Haemophilia
 - Colour blindness
 - Sickle cell anaemia

- (x) It helps in determining the homozygosity or heterozygosity of the dominant parent:
- Co-dominance
 - Incomplete dominance
 - Epistasis
 - Test Cross
- (xi) The capacity of a living system to lose water is:
- Osmotic pressure
 - Water potential
 - Osmosis
 - Plasmolysis
- (xii) Plants growing in saline marshlands are termed:
- Hydrophytes
 - Halophytes
 - Mesophytes
 - Xerophytes
- (xiii) Number of chromosomes in sugar cane is:
- 80
 - 46
 - 100
 - 95
- (xiv) The coldest desert is:
- Gobi
 - Thar
 - Thull
 - Cholistan
- (xv) The net movement of water molecules remains in equilibrium when a cell is placed in:
- Hypotonic solution
 - Hypertonic solution
 - Isotonic solution
 - None of these
- (xvi) Phototropic curvature is due to light effect on distribution of this hormone:
- Gibberellin
 - Auxin
 - Cytokinin
 - Ethene

BOTANY

Time: 1 Hours 45 Minutes

2012
Marks: 32

SECTION 'B' (SHORT-ANSWER QUESTIONS)(20)

NOTE: Answer 10 questions from this section.

- Write a note on the role of Auxin.
- Differentiate any one of the following:
 - Activities of Vascular cambium and Cork Cambium
 - Heartwood and Sapwood
- Define Seed dormancy or Vernalization
- Write a note on the phases of growth in plants.
- Define Linkage and crossing over.
- Write a note on Down's syndrome
- Define Point mutation. Discuss sickle cell Anaemia or phenylketonuria.
- Write a note on various ecological levels of organization.

- (ix) Define \square^h factor. Describe how children are in danger of being born with the disease 'Erythroblastosis foetalis'.
- (x) Write a note on Test Cross?
- (xi) Write a note on Excretion in Plants.
- (xii) How do plants cope with Cold and Heat Stress?
- (xiii) Explain either positive or negative interactions.
- (xiv) Write a note on Flow of Energy in an Ecosystem.
- (xv) Explain the significance of Secondary growth.

SECTION 'C' (DETAILED-ANSWER QUESTIONS)

NOTE: Answer 2 question from this section (12)

- 3.(i) Define Mitosis. Describe various stages of Mitosis with the help of diagram.
- (ii) Define Ecosystem. Describe Desert or any type of Forest Ecosystem with special reference to Pakistan.
- (iii) Why did Mendel choose Garden pea for his experiments? State the Law of Segregation. Prove it with the help of Monohybrid cross.
- OR** What is Osmoregulation? Classify various types of plants on the basis of Osmoregulation.

BOTANY

Time: 15 Minutes

2011

Max. Marks: 08

SECTION "A" (MULTIPLE-CHOICE QUESTIONS)

1. Choose the correct answer for each from the given options:

- (i) The group of cells which is capable of division is called:
- Permanent
 - Meristematic
 - Mature
 - Storage
- (ii) In this sub-stage of prophase I of meiosis, crossing over occurs:
- Diplole
 - Diakinesis
 - Paehytene
 - Zygotene
- (iii) This bacterium lives in the root nodules of leguminous plant:
- Rhizobium
 - Clostridium
 - Cyanobacterium
 - Azotobacter
- (iv) Sex determination in Drosophila was discovered by:
- T.H. Morgan
 - Mendel
 - Watson
 - Darwin
- (v) Estuary is the meeting place of:
- Sea and pond
 - River and sea
 - Two seas
 - Lake and pond
- (vi) The salt concentration of sea water is generally:
- 3.5%
 - 5%
 - 4.6%
 - 4%
- (vii) In a cross, appearance of intermediate character is known as:
- Co-dominance
 - Epistasis
 - Incomplete dominance
 - None of these
- (viii) Cell becomes flaccid in this solution:
- Isotonic
 - Hypertonic
 - Hypotonic
 - None of these
- (ix) An example of growth inhibitor is:
- Indol acetic acid
 - Gibberellins
 - Zeatin
 - Abscistic acid

- (x) Secondary growth in stem is caused due to activity of:
- Cambium
 - Xylem
 - Phloem
 - None of these
- (xi) This is a type of orderly or programmed cell death:
- Necrosis
 - Apoptosis
 - Synapsis
 - Mitosis
- (xii) This gametes of YYRR will be:
- YY
 - YR
 - RR
 - All of these
- (xiii) This is an example of sex-linked inheritance in human beings:
- Colour blindness
 - Sickle cell anaemia
 - Huntington's disease
 - Cystic fibrosis
- (xiv) The study of living things in relation to its environment is called:
- Community
 - Ecosystem
 - Ecology
 - Succession
- (xv) The decomposers of an ecosystem are:
- Parasitic bacteria
 - Fungi
 - Bacteria
 - Bacteria & Fungi
- (xvi) These are the producers of a pond ecosystem:
- Bacteria
 - Fungi
 - Zooplankton
 - Phytoplankton
 - e.

BOTANY

Time: 1 Hours 45 Minutes

**2011
Marks: 32**

SECTION 'B' (SHORT-ANSWER QUESTIONS)(20)

NOTE: Answer 10 questions from this section.

- Define Autosomes and sex chromosomes.
- How do plants cope with heat stress and cold stress? Explain.
- Write a note on Sclerenchyma and its type.
- What is a meristem? Give its types.
- Differentiate between Racemose & Cymose inflorescenc.
- Explain interphase stage of cell cycle.
- Write a note on any ONE:
 - Photoperiodism
 - Types of seed germination

(viii) Write a note on any ONE:

- Light as a climatic factor
- Topographic factor

(ix) Write a note on any ONE:

- Coniferous forest
- Tundra Blome

(x) Write a note on Genetic code or Chromosomal aberration.

(xi) Write a note on Down's syndrome.

(xii) Write a short note on tissue culture.

(xiii) Define Incomplete dominance or Co-dominance?

(xiv) What do you mean by Necrosis and Apoptosis?

(xv) Make a chart showing chemical composition of chromosome.

SECTION 'C' (DETAILED-ANSWER QUESTIONS)

NOTE: Answer 2 question from this section (12)

3.(i) Discuss Watson and crick model of DNA and its replication.

OR

What is ecological succession? Describe Hydrosere or Xerosere in detail.

(ii) Define Meiosis. Describe various stages of Prophase-I of Meiosis.

(iii) How many types of movements are found in plants? Describe Paratonic movement in detail.

BOTANY

Time: 15 Minutes

2010

Max. Marks: 08

SECTION "A" (MULTIPLE-CHOICE QUESTIONS)

1. Choose the correct answer for each from the given options:

- (i) This is found in the soil of high salt concentration:
- Hydrophytes
 - Mesophytes
 - Halophytes
 - Xerophytes
- (ii) Thigmotropism is caused by:
- Heat
 - Touch
 - Light
 - Gravity of the earth
- (iii) The first line of defence against pathogens in plants is:
- Endodermis
 - Cortex
 - Cuticle
 - Epidermis
- (iv) This one is sexual reproduction:
- Apomixis
 - Anisogamy
 - Sporulation
- d. Tissue culture
- (v) Human gamete has:
- 23 chromosomes
 - 26 chromosomes
 - 36 chromosomes
 - 46 chromosomes
- (vi) The scientists who won the Nobel Prize in 1962 for discovering the structure of DNA is/are:
- James D. Watson
 - Francis H. Crick
 - All of them
 - Maurice H.F. Wilkins
- (vii) In a DNA duplex, cytosine always pairs with:
- Thymine
 - Adenine
 - Guanine
 - Uracil
- (viii) In humans the monosomic condition is:
- Down's syndrome
 - Turner's syndrome
 - Mongolism
 - Klinefelter's syndrome
- (ix) John Mendel explained his Law of Independent Assortment by:
- Two trait inheritance
 - Single trait inheritance
 - Test Cross
 - Sex linked inheritance

- (x) The tendency of genes in a chromosome to remain together is called:
- Epitasis
 - Lindage
 - Pleiotropy
 - Synapsis
- (xi) The Lowest Level of biological organization is:
- Ecosystem
 - Community
 - Habitat
 - Population
- (xii) The relationship of Predation is found in:
- Horse grass
 - Tiger deer
 - Alga fungus
 - Host parasite
- (xiii) The Lentic Ecosystem is found in:
- Lake
 - Spring
 - River
 - Tundra
- (xiv) The biome which is the bread basket of the world is called:
- Savannah
 - Grassland
 - Tundra
 - Tropical rain forests
- (xv) The secondary growth is caused by the activity of:
- Cambium
 - Phellogen of cork
 - Both cambium & phellogen of cork
 - None of them
- (xvi) To specify amino acid the genetic code uses:
- One base
 - Two bases
 - Three bases
 - Four bases

BOTANY

Time: 1 Hours 45 Minutes

2010
Marks: 32

SECTION 'B' (SHORT-ANSWER QUESTIONS)(20)

NOTE: Answer 10 questions from this section.

- (i) What are secondary tissues in plants? Write their significance.
- (ii) Differentiate between cymose and Racemose inflorescence.
- (iii) Write the role of Auxin in plant.
- (iv) Differentiate between any one of the following:
- Epigeal germination and Hypogeal germination
 - Photoperiodism and Phototropism
- (v) Define Chromosome. Write down the number of chromosomes of the following species.
- Frog
 - Human
 - Drosophila

- (vi) Differentiate any one of the following:
 - a. Co-dominance and Incomplete dominance
 - b. Significance of Meiosis and Mitosis
- (vii) Describe sickle cell anaemia.
- (viii) Explain Mendel's single trait inheritance.
- (ix) What is Test Cross? Explain it with one example.
- (x) Why is haemophilia rare in women as compare to men? Explain.
- (xi) Write briefly the topographic factors of Ecosystem.
- (xii) What is Symbiosis? Describe its various types.
- (xiii) What are the adaptations developed in Xerophytes to conserve water and survive during drought conditions?
- (xiv) Give the effects of red light and far red light in phytochrome system.
- (xv) What are the characteristics of coniferous forests? Write the location of these forests in Pakistan.

SECTION 'C' (DETAILED-ANSWER QUESTIONS)

NOTE: Answer 2 question from this section (12)

3.(i) What is environmental stress? Write its various types to explain their adverse effects on plants.

OR Define Mitosis. Describe various stages of mitosis with labeled diagrams.

- (ii) Define Mutation and describe its various types. How radiation and chemical mutagen damage DNA.
- (iii) What is upwelling? Describe in detail marine life in various zones.

BOTANY

2009

NOTE: Answer any Three questions.

- 1.(a) What is osmoregulation? Describe various types of plants on the basis of osmoregulation.
(b) Describe briefly the structure and function of Sclerenchyma Cell.

(c) What is Test Cross? Why is it performed?

(d) Write True or False for the following statements:

- (i) Nitrogen Deficiency in soil increases the growth rate of plant. **(F)**
- (ii) The no. of the pairs of chromosomes in a frog is 15. **(F)**
- (iii) The phenylketonuria is a genetic disorder in human. **(T)**
- (iv) In Pakistan, the forest occupy about 6% of the total land area. **(T)**
- (v) The term Ecosystem was first used by Tansley in 1935. **(T)**
- (vi) \square^h positive is about 65% of population. **(F)**

2.(a)(i) Where do you find the Meiotic and mitotic cell division in plants?

(ii) Describe various sub-stage of Prophase-1 of meiosis, with well labeled diagram.

(b) What is Pollination? Describe the role of pollen tube in fertilization.

(c) Write a short note on Positive OR negative interaction in organisms.

(d) Choose the correct answer for each from the given options:

(i) The net movement of molecules remains in equilibrium when a cell is placed in:

- a. Hypotonic solution
- b. Hypertonic solution
- c. Isotonic solution
- d. None of these

(ii) The sclereids cells are type of:

- a. Parenchyma
- b. Collenchyma
- c. Xylem
- d. Sclerenchyma

(iii) The movement which occurs due to differences in the rate of growth on the two opposite sides of a plant organ is called:

- a. Nastic
- b. Tropic
- c. Tactic
- d. All of these

(iv) The type of inflorescence in Banana is:

- a. Corymb
- b. Capitulum
- c. Spadix
- d. Catkin

(v) The multiple effects of a single gene or allele are called:

- a. Epistasis
- b. Polygenic inheritance
- c. Pleiotropy
- d. Erythroblastosis

(vi) Highly condensed portion of the chromatin are called:

- a. Euchromatin
- b. Heterochromatin
- c. Both of these
- d. None of these

3.(a) Would the result of the following two crosses be same? If no, give the reasons.

(i) Red eyes female drosophila X white eyed male drosophila

(ii) Red eyed male drosophila X White eyed female drosophila

(b) Differentiate between Asexual and Sexual type of reproduction in plants & write only the names of the type

(c) Write a short note on Sickle cell anemia or photoperiodism.

(d) Fill in the blanks with appropriate words:

(i) All aquatic and terrestrial ecosystem collectively constitute _____

(ii) Plant hormone responsible for apical dominance is _____

(iii) The simplest form of sexual reproduction in plant is _____

(iv) The tendency of gene in a chromosome to remain together. Is called _____

(v) In plant, The movements which occur due to internal stimuli are called _____

(vi) Seed develops into a new plant by a process of _____.

4.(a)(i) State the law of independent assortment with phenotypic ratio:

(ii) Differentiate between Alleles and multiple alleles.

(iii) Describe different blood groups and blood types in human beings.

(b) Write short note on any one of the following:

(i) Different Approaches to Ecology

(ii) Significance of Secondary Growth

(c) How and when does the Meiotic error take place? Describe any one type of Syndrome.

(d) Write whether the following statements are True or False:

(i) Diabetes mellitus type I is insulin dependent diabetes. **(T)**

(ii) One-gene enzyme hypothesis was suggested by Beadle and Tatum. **(T)**

(iii) Crossing over may occur at more than one point. **(T)**

(iv) Movement in curvature of the whole organ towards or away from the stimuli is the growth movement. **(T)**

(v) Light cannot reach to the producer in the Euphotic zone of the sea. **(F)**

(vi) The flowers of Nicotia are closed in day and open at night. **(F)**

5.(a) How did Griffith, Harshay and chase proved that DNA is a genetic material?

OR By specifying your enzyme, DNA specifies you' justify this statement with the help of experiments on Neurospora.

(b) Describe in detail the Chromosomal Aberrations or genetic Code.

(c) Differentiate between Racemose and Cymose inflorescence.

(d) Fill in the blanks with the correct answer:

(i) In an ecosystem the micro-saprotrophs are called _____

(ii) Age of an old plant can be estimated by their _____

(iii) The particular array of the chromosomes that an individual possesses is called _____

(iv) DNA is made of billions of units called _____

(v) The process of the separation of bivalents during is called _____

(vi) The movement of plant in response to touch stimuli is _____