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**M.Sc. (Semester - I) (New) (CBCS) Examination: March/April-2023**  
**GENETICS**

**Concepts of Genetics (MSC29101)**

Day & Date: Wednesday, 19-07-2023  
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) Question 1 and 2 are compulsory.  
2) Answer any Three questions from Q.3 to 7  
3) All questions carry equal marks.  
4) Draw neat and labeled diagrams wherever necessary.

**Q.1 A) Multiple Choice Questions.**

**10**

- 1) A individual with blood group heterozygous 'A', what will be the possible blood groups of his parent?
  - a) AB and O
  - b) A and O
  - c) Pure A and pure B
  - d) Option a and b
- 2) Change of a single nucleotide is called as \_\_\_\_\_.
  - a) Framshift mutation
  - b) Insertion mutation
  - c) Duplication mutation
  - d) Point mutation
- 3) The gene present on non-homologous region of Y-chromosome are called as \_\_\_\_\_.
  - a) Holandric gene
  - b) Somatic gene
  - c) Recessive gene
  - d) Hemizygous
- 4) \_\_\_\_\_ is formed by UV radiation.
  - a) Adanine dimers
  - b) Guanine dimmers
  - c) Thymine dimmers
  - d) Urasil dimmers
- 5) In Chinchilla fur colour, \_\_\_\_\_ Pigmentation is absent.
  - a) White
  - b) Yellow
  - c) Black
  - d) Red
- 6) Crossing over is advantageous because it brings about \_\_\_\_\_.
  - a) Variation
  - b) Linkage
  - c) In breeding
  - d) Stability
- 7) The phenotypic ratio of a dihybrid cross is \_\_\_\_\_.
  - a) 1:2:1
  - b) 3:1
  - c) 2:1:1
  - d) 9:3:3:1
- 8) The cross between heterozygous F1 hybrid and \_\_\_\_\_ is known as the test cross.
  - a) the dominant homozygous
  - b) F1Hybrid
  - c) the double recessive homozygous
  - d) Heterozygous
- 9) Alleles are nothing but \_\_\_\_\_.
  - a) Alternate forms of genes
  - b) Linked genes
  - c) Chromosomes that have crossed over
  - d) Homologous chromosomes

- 10) The genome of *Arabidopsis thaliana* has \_\_\_\_\_ chromosomes.
- |           |         |
|-----------|---------|
| a) Five   | b) Two  |
| c) Eleven | d) Nine |

**B) Answer the following. 06**

- 1) The crossing of F1 to either of the parents is known as \_\_\_\_\_.
- 2) An exception to Mendel's law is \_\_\_\_\_.
- 3) The tendency of an offspring to resemble its parent is known as \_\_\_\_\_.
- 4) Coat colour in Rabbit and mice is the example of \_\_\_\_\_.
- 5) Milk production in female cattle is an example of \_\_\_\_\_.
- 6) Point Mutation is nothing but change in \_\_\_\_\_.

**Q.2 Answer the following. 16**

- 1) Write about Test cross.
- 2) Explain 3:1 phenotypic ratio.
- 3) Write about complementation test.
- 4) What is heritability?

**Q.3 Answer the following.**

- |  |           |
|--|-----------|
| a) Add a note on chemical mutagenic agents.  | <b>08</b> |
| b) Describe Colour blindness and hemophilia. | <b>08</b> |

**Q.4 Answer the following.**

- |  |           |
|--|-----------|
| a) What are multiple alleles? Add a note on multiple alleles involved in Rabbit coat colour. | <b>10</b> |
| b) Explain Base Excision Repair.   | <b>06</b> |

**Q.5 Answer the following.**

- |  |           |
|--|-----------|
| a) Give general outline of <i>E.coli</i> genome.       | <b>10</b> |
| b) Explain incomplete dominance with suitable example. | <b>06</b> |

**Q.6 Answer the following.**

- |   |           |
|---|-----------|
| a) Explain law of Independent Assortment with suitable example of dihybrid cross. | <b>08</b> |
| b) Describe gene penetrance and its types.  | <b>08</b> |

**Q.7 Answer the following.**

- |  |           |
|--|-----------|
| a) Explain in detail complete and incomplete linkage with suitable examples. | <b>08</b> |
| b) Describe transposon mediated mutagenesis.                                 | <b>08</b> |

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**M.Sc. (Semester - I) (New) (CBCS) Examination March/April-2023  
GENETICS**

**Cellular and Molecular Biology (MSC29108)**

Day & Date: Saturday, 22-07-2023  
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) Question 1 and 2 are compulsory.  
2) Attempt any Three from Q.3 to Q.7.  
3) Figure to right indicate full marks.

**Q.1 A) Choose the correct alternatives from the given options.**

**10**

- 1) In eukaryotes rRNA is transcribed by \_\_\_\_\_.  
a) RNA polymerase I                      b) RNA polymerase II  
c) RNA polymerase III                  d) Poly A polymerase
- 2) \_\_\_\_\_ codon codes for methionine in eukaryotes.  
a) UAA    b) AUG  
c) UGA    d) UAG
- 3) In prokaryotes \_\_\_\_\_ is responsible for removal RNA primers.  
a) DNA polymerase I                      b) DNA polymerase II  
c) DNA polymerase III                  d) DNA polymerase IV
- 4) Microfilaments are polymer of \_\_\_\_\_.  
a) Tubulin dimer                              b) Globular actin  
c) Albumin                                      d) Lamin
- 5) \_\_\_\_\_ proposed the Fluid mosaic model of plasma membrane.  
a) Watson & Crick                          b) Singer & Nicolson  
c) Temin & Baltimore                      d) Jacob & Monad
- 6) \_\_\_\_\_ is not an example of passive transport.  
a) simple diffusion                          b) facilitated diffusion  
c) Osmosis                                      d) Na-K ATPase pump
- 7) In prokaryotes, elongation of transcription process is by \_\_\_\_\_.  
a) Sigma factor                              b) Rho factor  
c) Pol-  $\alpha$                                       d) Core enzyme
- 8) \_\_\_\_\_ are also known as Zonula occludens.  
a) Desmosomes                              b) Hemi-desmosomes  
c) Gap junctions                              d) Tight junctions
- 9) ARF1 is a \_\_\_\_\_ binding protein.  
a) Carbohydrate                              b) GTP  
c) GDP    d) ATP
- 10) During cell cycle \_\_\_\_\_ condition is necessary for a cell to qualify through the G2 checkpoint.  
a) Cell should be of a size sufficient enough  
b) Complete and accurate DNA replication  
c) Sufficient stockpile of nucleotides  
d) Complete attachment of mitotic spindle fibers to kinetochores

**B) Fill in the blanks.****06**

- 1) \_\_\_\_\_ enzyme required for unwinding of DNA duplex during replication.
- 2) Dyenins are \_\_\_\_\_ end directed motor proteins of microtubules.
- 3) Unit membrane model of plasma membrane was proposed by \_\_\_\_\_.
- 4) \_\_\_\_\_ proposed the Clover leaf model of tRNA molecule.
- 5) \_\_\_\_\_ are known as communicating junction in animal cells.
- 6) AGGAGGU sequences are identified as \_\_\_\_\_ binding site in prokaryotes.

**Q.2 Answer the following.****16**

- a) Describe different types of DNA polymerases in eukaryotes.
- b) Write a note on ribosomes.
- c) Describe structure and functions of actin filaments.
- d) Write a note on desmosomes.

**Q.3 Answer the following.****16**

- a) Describe mechanism of replication in eukaryotes.
- b) Describe mechanism of transcription in prokaryotes.

**Q.4 Answer the following.****16**

- a) Explain characteristics of genetic code with suitable examples.
- b) Describe structure and functions of intermediate filaments.

**Q.5 Answer the following.****16**

- a) Explain process of vesicular transport between ER and Golgi apparatus.
- b) Describe mechanism of regulation of eukaryotic cell cycle.

**Q.6 Answer the following.****16**

- a) Describe mechanism of translation in eukaryotes.
- b) Explain structure and functions of dyenins and kinesins.

**Q.7 Answer the following.****16**

- a) Explain Ras-MAP kinase signal transduction pathway.
- b) Describe structure and functions of various cell-cell adhesion molecules.

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**M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2023  
GENETICS**

**Immunology & Immunotechnology (MSC29301)**

Day & Date: Monday, 10-07-2023

Max. Marks: 80

Time: 11:00 AM To 02:00 PM

- Instructions:** 1) Q. Nos 1 and 2 are compulsory.  
2) Attempt any Three questions from Q. No.3 to Q. No.7  
3) Figures to the right indicates full marks.

**Q.1 A) Choose the correct alternatives from the given options. 10**

- 1) Which among the following are Primary lymphoid organs?
  - a) Lymph nodes
  - b) Spleen
  - c) Thymus and Bone marrow
  - d) Mucosa Associated Lymphoid Tissues
- 2) Which term is used for Engulfment and destruction of pathogenic microorganisms by lymphoid cells?
  - a) Pinocytosis
  - b) Cytolysis
  - c) Phagocytosis
  - d) Plasmolysis
- 3) What is referred as when an animal is given an antigen preparation to induce the formation of antibodies and activated lymphocytes?
  - a) Artificially acquired active immunity
  - b) Naturally acquired active immunity
  - c) Artificially acquired passive immunity
  - d) Naturally acquired passive immunity
- 4) What is called as to a substance, which stimulates the production of an antibody (AMI) and reacts specifically with it when injected into the body?
  - a) Antibody
  - b) Complement
  - c) Interferon
  - d) Antigen
- 5) What does it contain in Immunoglobulin?
  - a) 1 H chain and 1 L chain
  - b) 2 H chains and 2 L chains
  - c) 3 H chains and 3 L chains
  - d) 4 H chains and 4 L chains
- 6) Which Antibody is found in colostrums, saliva and tears?
  - a) IgE
  - b) IgA
  - c) IgD
  - d) IgG
- 7) What is called to the highest dilution of the serum containing antibodies which shows an observable reaction with the antigen in the particular test?
  - a) Sensitivity
  - b) Specificity
  - c) Antibody titre
  - d) Viscosity
- 8) What is the name of process in which Histamine, leukotrienes, heparin, prostaglandins substances are released?
  - a) Allergic reaction
  - b) Vaccination
  - c) Inflammation
  - d) Phagocytosis



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**M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2023**  
**GENETICS**  
**Genetic Engineering (MSC29302)**

Day & Date: Tuesday, 11-07-2023  
 Time: 11:00 AM To 02:00 PM

Max. Marks: 80

- Instructions:** 1) Question Nos.1 and 2 are compulsory.  
 2) Attempt any three questions from Q. No. 3 to Q. No. 7.  
 3) Figure to right indicate full marks.

**Q.1 A) Choose correct alternative. (MCQ) 10**

- 1) \_\_\_\_\_ region of the phage genome is not essential for growth.
  - a) Between N and Q genes
  - b) Cohesive sites
  - c) Recombination and lysogenization
  - d) Host lysis
- 2) \_\_\_\_\_ removes a length of DNA between two telomere sequences.
  - a) EcoRI
  - b) EcoRII
  - c) BamHI
  - d) HindIII
- 3) In hybridization method, \_\_\_\_\_ is pressed onto agar.
  - a) Silicon paper
  - b) Nitrocellulose paper
  - c) Filter paper
  - d) PVDF
- 4) DNA Ligase, used in recombinant DNA technology is obtained from \_\_\_\_\_.
  - a) *E. coli* only
  - b) *E. coli* and also Ligase encoded by T4 phage
  - c) *Saccharomyces* species
  - d) Retroviruses
- 5) Size of pBR322 is \_\_\_\_\_.
  - a) 100 kb
  - b) 10 kb
  - c) 4.3 kb
  - d) 1 kb
- 6) \_\_\_\_\_ is the smallest plasmid and an ideal cloning vector.
  - a) ColE1
  - b) RP4
  - c) pUC18
  - d) F
- 7) Degradative plasmid TOL, responsible for the metabolism of toluene is present in \_\_\_\_\_.
  - a) *Escherichia coli*
  - b) *Saccharomyces cerevisiae*
  - c) *Staphylococcus aureus*
  - d) *Pseudomonas putida*
- 8) \_\_\_\_\_ is the role of Rop protein in a plasmid.
  - a) Maintaining stability
  - b) Antibiotic resistance
  - c) Maintaining copy number
  - d) Conversion into a shuttle vector

- 9) The correct order of arrangement of cloning vectors with decreasing cloning capacity is \_\_\_\_\_.
- BAC, Cosmid, Phage, Plasmid, YAC
  - YAC, BAC, Cosmid, Phage, Plasmid
  - Phage, Cosmid, YAC, BAC, Plasmid
  - Cosmid, BAC, YAC, Phage, Plasmid
- 10) \_\_\_\_\_ is not a component of YAC.
- Centromere
  - Telomere
  - Origin of replication
  - Cos site

**B) Fill in the blanks.**

**06**

- \_\_\_\_\_ is a DNA molecule that is used to carry a foreign DNA into the host cell.
- \_\_\_\_\_ is used for making DNA fragments with blunt ends shorter from both its ends.
- \_\_\_\_\_ enzyme is used for removal of single-stranded protrusions from ends; both 3'- and 5'-extensions are removed.
- Introduction of DNA into cells by exposing to high voltage electric pulse is called as \_\_\_\_\_.
- \_\_\_\_\_ is an endo-ribonuclease that specifically hydrolyses the phosphodiester bonds of RNA which is hybridized to DNA.
- Ability of a cell to grow into a complete individual is called \_\_\_\_\_.

**Q.2 Answer the following.**

**16**

- C-DNA probes.
- Cosmids.
- Agrobacterium tumefaciens*.
- Genetic engineering in *Trypanosoma cruzi*.

**Q.3 Answer the following.**

- What are the characteristics of ideal plasmid vectors? Discuss pUC18 with its idea features. **10**
- What are restriction endonucleases? Discuss Type II restriction endonucleases with example. **06**

**Q.4 Answer the following.**

- Take a detailed account of PCR technique and its types. **10**
- Restricted Fragment Length Polymorphism. **06**

**Q.5 Answer the following.**

- What is genomic library? Write on its Construction. **10**
- Screening of Recombinant cell by colony hybridization. **06**

**Q.6 Answer the following.**

- Describe DNA sequencing by Maxam and Gilbert's method. **10**
- Write on Transformation of cell by electroporation and CaC1<sub>2</sub>. **06**

**Q.7 Answer the following.**

- Describe production of insulin by genetically engineered *E. coli*. **08**
- Discuss development of plant as edible vaccines by genetic engineering. **08**



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**M.Sc. (Semester - III) (New) (CBCS) Examination: March/April-2023**  
**GENETICS**  
**Molecular Medicine (MSC29306)**

Day & Date: Wednesday, 12-07-2023  
 Time: 11:00 AM To 02:00 PM

Max. Marks: 80

- Instructions:** 1) Q. Nos. 1 and. 2 are compulsory.  
 2) Attempt any three questions from Q. No. 3 to Q. No. 7  
 3) Figure to right indicate full marks.

**Q.1 A) Rewrite the sentence using correct alternative. 10**

- 1) The genetic and the physical maps were assigned based on \_\_\_\_\_ the genome.
  - a) Microsatellites
  - b) Macrosatellites
  - c) Kinetochores
  - d) Centromeres
- 2) If the blood group of an individual is A then the antibody present is \_\_\_\_\_.
  - a) Anti B antibodies
  - b) Anti A antibodies
  - c) Anti O antibodies
  - d) Anti OA antibodies
- 3) \_\_\_\_\_ is caused by a mutation in the HTT gene.
  - a) Agammaglobulinemia
  - b) Phenylketonuria
  - c) Parkinson's disease
  - d) Huntington disease
- 4) Stem cells are present in \_\_\_\_\_.
  - a) unicellular organisms
  - b) multicellular organisms
  - c) non-living things
  - d) viruses
- 5) The common gene delivery system for in vivo gene therapy is \_\_\_\_\_.
  - a) Electroporation
  - b) microinjection
  - c) Lipofection
  - d) adeno viral vectors
- 6) \_\_\_\_\_ is the most frequently utilized source of Mesenchymal stem cells.
  - a) Adrenal glands
  - b) Bone Marrow
  - c) Brain
  - d) Kidney
- 7) Gene therapy in humans was first practiced by Michael Blaise and W. French Anderson to cure \_\_\_\_\_.
  - a) Cystic fibrosis
  - b) Haemophilia
  - c) Thalassemia
  - d) SCID
- 8) MHC antigen in mouse is known as \_\_\_\_\_.
  - a) HLA
  - b) H-2
  - c) H-3
  - d) HLB
- 9) Bioavailability is \_\_\_\_\_.
  - a) The time of absorption of the drug from its dosage form.
  - b) The rate of absorption of the unchanged drug from its dosage form.
  - c) The time of absorption of the unchanged drug from its dosage form.
  - d) The rate of absorption of the drug from its dosage form.

- 10) \_\_\_\_\_ is the major process of absorption for more than 90% of drugs.
- a) Facilitated diffusion
  - b) Active transport
  - c) Endocytosis
  - d) Passive diffusion

**B) Fill in the blanks.****06**

- 1) \_\_\_\_\_ is a procedure by which amniotic fluid is removed from the uterus for diagnosis purpose.
- 2) DNA microarray is invented by scientist \_\_\_\_\_.
- 3) Trisomy 21, is also referred as \_\_\_\_\_.
- 4) \_\_\_\_\_ is defined as the study of variability in drug response due to heredity.
- 5) \_\_\_\_\_ is the principal organ for drug excretion.
- 6) Full form of MHC is \_\_\_\_\_.

**Q.2 Answer the following.****16**

- a) Write short note on Functional cloning.
- b) Write short note on Sickle cell anemia.
- c) Explain in short DNA Fingerprinting.
- d) Explain In-vivo Gene therapy.

**Q.3 Answer the following.**

- a) Explain in detail stem cells and their types.
- b) Explain the mechanism of DNA Microarray technology.

**08****08****Q.4 Answer the following.**

- a) Give an account on Prenatal Diagnosis techniques and its applications.
- b) Explain in detail Cystic fibrosis.

**10****06****Q.5 Answer the following.**

- a) Write an account on Non-Viral Methods of Gene transfer.
- b) Describe in brief Nature and Sources of drugs.

**08****08****Q.6 Answer the following.**

- a) Write an account on unique properties of stem cells.
- b) Explain Steps involved in Drug Discovery.

**10****06****Q.7 Answer the following.**

- a) Write note on Agammaglobulinemia.
- b) Give an account on Human genome project.

**08****08**

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**M.Sc. (Semester - IV) (New) (CBCS) Examination March/April-2023  
GENETICS**

**Cancer Genetics and Stem Cell Research (MSC29401)**

Day & Date: Monday, 10-07-2023  
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) Question 1 and 2 are compulsory.  
2) Attempt any Three from Q.3 to Q.7  
3) All questions carry equal marks.  
4) Draw neat and labeled diagrams wherever necessary.

**Q.1 A) Choose the correct alternatives from the given options. 10**

- 1) \_\_\_\_\_ of the following is NOT the example of proto-oncogenes.
 

a) Rb	b) Src
c) Myc	d) Abl
- 2) Cancer is caused by \_\_\_\_\_.
 

a) Necrosis
b) Uncontrolled cell division
c) Plasma membrane rupturing
d) cell signaling
- 3) Arrange the following sequences of tumor development in the correct order.
 

1) Metastasis	2) Progression
3) Promotion	4) Initiation

a) 2, 3, 4, 1	b) 4, 3, 2, 1
c) 1, 2, 3, 4	d) 1, 3, 4, 2
- 4) Angiogenesis is nothing but \_\_\_\_\_.
 

a) Differentiation process	b) Growth factors
c) Contact inhibition	d) New Blood vessel formation
- 5) The most common cancer in the world, due to which women died IS \_\_\_\_\_.
 

a) Breast Cancer	b) Ovarian Cancer
c) Rectal Cancer	d) Vaginal Cancer
- 6) \_\_\_\_\_ molecules is directly involved in angiogenesis.
 

a) VEGF	b) Cytochrome C
c) Cyclin	d) EGF
- 7) Anticancer drug that is also used to treat psoriasis and rheumatoid arthritis: \_\_\_\_\_.
 

a) mercaptomurine (6-MP)	b) methotrexate
c) procarbazine (Matulane)	d) allopurinol (Zyloprim, Purinol)
- 8) An embryonic stem cell can be described as \_\_\_\_\_.
 

a) Totipotent	b) Pluripotent
c) Multipotent	d) Unipotent
- 9) Embryonic stem cells isolated from blastula are \_\_\_\_\_.
 

a) Pluripotent	b) Multipotent
c) Oligopotent	d) Totipotent

- 10) Bioink is \_\_\_\_\_ in bioprinting.  
 a) cell carrier material                      b) cell free material  
 c) cell absorbing material                  d) cell deleting material

**B) Fill in the blanks OR Write true/false. 06**

- 1) When cancer cells are grown in culture, they do not form monolayers.  
 a) True    b) False  
 2) Apoptosis is programmed cell death.  
 a) True    b) False  
 3) Angiogenesis is not occurred in normal physiology  
 a) True    b) False  
 4) All adult body cells are not stem cell  
 a) True    b) False  
 5) \_\_\_\_\_ tumor suppressor gene is mutated in over 50% of cancers.  
 6) Caspases belong to the class of \_\_\_\_\_.

**Q.2 Answer the following. 16**

- a) Write short note on tumor suppressor gene BRCA.  
 b) Write short note on Embryonic Stem Cells.  
 c) Explain role of Epigenetic in cancer.  
 d) Write about pRb regulation.

**Q.3 Answer the following. 10**

- a) Explain in detail processes of new blood vessel synthesis in cancer region. 10  
 b) Explain role of mitochondria in apoptosis. 06

**Q.4 Answer the following. 16**

- a) Write a note on cascade event of Cancer spreading.  
 b) Write a note on Radiation therapy on Cancer.

**Q.5 Answer the following. 10**

- a) Describe different factors activating proto-oncogene to oncogene. 10  
 b) Write a note on trypsinization of tissue. 06

**Q.6 Answer the following. 16**

- a) Write a note on principle of tissue culture.  
 b) Add a note on Transplantation Technique.

**Q.7 Answer the following. 10**

- a) Explain detail about Bioprinting of Organs and Tissues. 10  
 b) Add a note on Bioartificial Pancreas. 06

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**M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2023**  
**GENETICS**

**Analytical Instruments and Techniques (MSC29402)**

Day & Date: Wednesday, 12-07-2023  
Time: 03:00 PM To 06:00 PM

Max. Marks: 80

- Instructions:** 1) Q. Nos. 1 and. 2 are compulsory.  
2) Attempt any three questions from Q. No. 3 to Q. No. 7  
3) Figure to right indicate full marks.

**Q.1 A) Choose correct alternative. (MCQ) 10**

- 1) The charged molecules can be separated by \_\_\_\_\_.  
a) Column chromatography  
b) Ion exchange chromatography  
c) Thin layer chromatography  
d) Affinity chromatography
- 2) The maximum possible numerical aperture of 1.5 is for a \_\_\_\_\_ lens.  
a) oil immersion  
b) air interface  
c) water interface  
d) Binocular
- 3) NMR spectroscopy indicates the chemical nature of the \_\_\_\_\_ and spatial positions of \_\_\_\_\_.  
a) Electrons, Protons  
b) Neutrons, electrons  
c) Nuclei, electrons  
d) Nuclei, neighboring nuclei
- 4) In the sample cell, \_\_\_\_\_ is selected to give maximum optical transmission in the UV- visible region.  
a) Tungsten  
b) Quartz  
c) Phosphor  
d) Potassium
- 5) The resolving power of TEM is derived from \_\_\_\_\_.  
a) Electrons  
b) Specimens  
c) Power  
d) ocular system
- 6) \_\_\_\_\_ centrifugation is used to separate certain organelles from whole cell.  
a) Rate-zonal centrifugation  
b) Normal centrifugation  
c) Differential centrifugation  
d) Isopycnic centrifugation
- 7) In \_\_\_\_\_ state of matter mass spectroscopy is being performed.  
a) Solid  
b) Liquid  
c) Gaseous  
d) Plasma
- 8) The cathode of transmission electron microscope consists of a \_\_\_\_\_.  
a) tungsten wire  
b) Bulb  
c) iron filament  
d) gold wire
- 9) Resolving power of a microscope is a function of \_\_\_\_\_.  
a) Wavelength of light used  
b) Numerical aperture of lens system  
c) Refractive index  
d) Wavelength of light used and numerical aperture of lens system



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**M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2023  
GENETICS**

**Agriculture Science and Seed Technology (MSC29403)**

Day &amp; Date: Friday, 14-07-2023

Max. Marks: 80

Time: 03:00 PM To 06:00 PM

- Instructions:** 1) Question no. 1 and 2 are compulsory.  
2) Attempt any three questions from Q. No. 3 to Q. No. 7.  
3) Figure to right indicate full marks.

**Q.1 A) Multiple choice questions.****10**

- 1) Water Available for Plants within the Soil is Known as\_\_\_\_\_.  
a) Mineral water                      b) Hygroscopic water  
c) Capillary water                      d) Chemically bound water
- 2) Wilting of a Plant is a Result of Excessive\_\_\_\_\_.  
a) Transpiration                      b) Absorption  
c) Photosynthesis                      d) Respiration
- 3) Among the following, \_\_\_\_\_ Acid is a Derivative of Carotenoids.  
a) Gibberellic acid                      b) Indole butyric acid  
c) Indole-3-acetic acid                      d) Abscisic acid
- 4) In India types of soil found are\_\_\_\_\_.  
a) 6    b) 4  
c) 5    d) 8
- 5) \_\_\_\_\_ determines color, texture, chemical properties, mineral content and permeability of soil.  
a) flora and fauna                      b) Time  
c) Climate                                      d) parent rock
- 6) The chief characteristics of mix farming is\_\_\_\_\_.  
a) Cultivation of both cash crops and food crops  
b) cultivation of two or more crops in the same field  
c) Rearing of animals and cultivation of crop together  
d) none of the above
- 7) Free from inert matter and defective seeds are termed as\_\_\_\_\_.  
a) Natural purity                      b) Genetic purity  
c) Physical purity                      d) chemical purity
- 8) Seed meant for generation, distribution to the farmers for commercial seed production is called as\_\_\_\_\_.  
a) Breeder seed                      b) Foundation seed  
c) Nucleus seed                      d) Certified seed
- 9) Collective name of layers of soil is called as\_\_\_\_\_.  
a) soil layer                                      b) soil profile  
c) soil rate                                      d) soil texture
- 10) Which of the following is not a biofertilizer?  
a) Mycorrhiza                                      b) Rhizobium  
c) Agrobacterium                                      d) Nostoc

**B) Fill in the blanks OR Write true/false.**

- 1) The manure from animals is used as fertilizer for the soil in which crops are grown.
  - a) True
  - b) False
- 2) Turgidity of cell is maintained by wall pressure.
  - a) True
  - b) False
- 3) Abscisic acid is reason for seed dormancy.
  - a) True
  - b) False
- 4) The physical process involved in diffusion of molecular oxygen from leaves is known as diffusion.
  - a) True
  - b) False
- 5) Fungi and bacteria usually enter through hydathodes in plants.
  - a) True
  - b) False
- 6) The grow out test is done for verification of genetic purity.
  - a) True
  - b) False

**Q.2 Answer the following.**

16

- a) Explain plant cell water relation.
- b) Explain mineral deficiencies and their symptoms in plants.
- c) Explain soil types in India.
- d) Explain photo oxidative stress.

**Q.3 Answer the following.**

16

- a) Explain mineral and organic constituents of soil and its role in crop production.
- b) Explain chemical and microbiological properties of soil.

**Q.4 Answer the following.**

16

- a) Explain physiological and molecular response to salinity stress, temperature stress.
- b) Explain Animal breeding with example.

**Q.5 Answer the following.**

16

- a) Explain principle of soil fertility and soil composition.
- b) Explain Seed dormancy and germination.

**Q.6 Answer the following.**

16

- a) Explain process of fruit ripening and its control.
- b) Explain plant growth hormones and its role in plant growth.

**Q.7 Answer the following.**

16

- a) Explain relation between plant and animal husbandry and mixed farming.
- b) Explain New seed policy and seed control order.



Seat No.	
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Set P
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**M.Sc. (Semester - IV) (New) (CBCS) Examination: March/April-2023**  
**GENETICS**  
**Research Methodology and Scientific report writing and IPR**  
**(MSC29406)**

Day & Date: Sunday, 16-07-2023

Max. Marks: 80

Time: 03:00 PM To 06:00 PM

- Instructions:** 1) Q. Nos. 1 and 2 are compulsory.  
2) Attempt any Three questions from Q.No.3 to Q.No.7.  
3) Figures to the right indicate full marks.

**Q.1 A) Choose the correct alternatives from the options. 10**

- 1) \_\_\_\_\_ is related to some abstract idea.
  - a) Conceptual
  - b) Clinical
  - c) Quantitative
  - d) Applied
- 2) Which of following is not a characteristic of hypothesis?
  - a) Hypothesis should be consistent with most unknown facts
  - b) Hypothesis should be amenable to testing within a reasonable time.
  - c) Hypothesis should be limited in scope and must be specific.
  - d) Hypothesis should be capable of being tested.
- 3) \_\_\_\_\_ are conducted in case of descriptive research studies.
  - a) Surveys
  - b) Experiments
  - c) Both surveys and experiments
  - d) Neither Surveys nor experiments
- 4) \_\_\_\_\_ should placed at bottom of page in a document.
  - a) Title
  - b) Footnotes
  - c) Dates
  - d) Place
- 5) Analysis of variance is statistical method of comparing the several population \_\_\_\_\_.
  - a) Means
  - b) Variance
  - c) SD
  - d) Interaction
- 6) Plagiarism in research is \_\_\_\_\_.
  - a) creative use of previous data
  - b) Copying unscrupulous and making use of it
  - c) Quoting someone and citing him or her
  - d) Referring to previous data and working over it with new objectives

- 7) IPR in India covers \_\_\_\_\_.
  - a) Patent
  - b) Copyrights
  - c) Trademarks
  - d) All of above
- 8) Trade marks in India enacted in \_\_\_\_\_.
  - a) 1999
  - b) 2000
  - c) 2001
  - d) 2002
- 9) Exploitation of indigenous knowledge without proper compensation termed as \_\_\_\_\_.
  - a) Biodiversity
  - b) Bioprospecting
  - c) Biopiracy
  - d) Traditional knowledge
- 10) How many years a patent is valid in India?
  - a) 30
  - b) 20
  - c) 40
  - d) 10

**B) State whether statement is true or false** **06**

- 1) Applied research aims at finding a solution for an immediate problem facing a society or industrial organization.
- 2) Sampling theory is applicable only to random samples.
- 3) Bibliography should always right first.
- 4) Trademark registration gives exclusive proprietary rights to trademark owner.
- 5) Composition of matter cannot be patented.
- 6) Farmers cannot claim for compensation if the registered variety of seed fails to provide expected performance under given conditions.

**Q.2 Write a note on** **16**

- a) Criteria of good research
- b) Cautious taken during secondary data collection
- c) Significance of report writing
- d) Traditional knowledge

**Q.3 Answer the following.**

- a) What is hypothesis? Explain procedure of hypothesis testing. **10**
- b) Research is much concerned with proper fact-finding, analysis of evaluation. Do you agree with this statement give the reasons to support your answer? **06**

**Q.4 Answer the following.**

- a) Write a note on Chi-square as non-paramatic test. **08**
- b) Explain in Characteristics of a Good Sample Design and types of sample designs. **08**

## SLR-SK-17

**Q.5 Answer the following.**

- a) Describe, in brief, the layout of a research report, covering all relevant points. **08**
- b) 'Interpretation is a fundamental component of research process', Explain. Why so? **08**

**Q.6 Answer the following.**

- a) Write a note on plagiarism. Mention tools used in detection of plagiarism. **08**
- b) Describe in brief patent procedure in India. **08**

**Q.7 Answer the following.**

- a) Give an account of Technology transfer and Indian scenario. **08**
- b) Detailed note. 'plant breeder's rights'. **08**