SLR-JL-236

Seat No.	

Set P

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2019
Genetics
CONCEPTS OF GENETICS

Day & Date: Monday, 18-11-2019 Max. Marks: 70
Time: 11:30 AM To 02:00 PM

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

Q.1 Fill in the blanks by choosing correct alternatives given below. **14**

1) When normal women married to colour-blind man all her sons and daughter have- _____.
   a) normal colour vision b) colourblind vision
   c) son only colourblind d) daughter colourblind

2) Mongolism caused due to trisomy of 21st chromosome of humans is _____.
   a) Down's syndrome b) Patau's syndrome
   c) Kline felter syndrome d) Turner's syndrome

3) Mutation arising due to change in a single base pair of DNA is known as _____.
   a) chromosomal aberrations b) point mutation
   c) gene mutation d) DNA mutation

4) Sex linked characters are_____.
   a) dominant b) recessive
   c) lethal d) not inherited

5) _____ genes are present on homologuos part of 'Y' chromosome which passed directly from father to son.
   a) Hemophilia b) Holandric
   c) Hologenic d) Diandric

6) Polytene chromosome first time observed by _____.
   a) Balbiani b) Painter
   c) Bridige d) Both a and b

7) A person with 47 chromosomes due to an additional Y- chromosome suffers from condition called _____.
   a) Down's syndrome b) Supermale
   c) Turner's syndrome d) Klinefelter syndrome

8) Homo sapiens has _____ pairs of chromosome.
   a) 23 b) 24
   c) 25 d) 26

9) Daughter of a colour blind father and normal mother marries a colour blind person. Colour blindness in their progeny shall be
   a) 50% sons and 50% daughters
   b) all sons and all daughters
   c) all daughters
   d) all sons

10) Which of the following is also called bleeder's disease?
   a) Anemia
   b) Thrombocytopenia
   c) Polycythemia
   d) Haemophilia

11) Hypertrichosis or hairy ears in sex- linked character associated with the _____.
   a) X- chromosome
   b) XX- chromosome
   c) XY- chromosome
   d) Y- chromosome

12) Cri- du- chat syndrome in humans is caused by the _____.
   a) loss of the short arm of chromosome 5
   b) loss of half the long arm of chromosome 5
   c) trisomy of 21st chromosome
   d) fertilization of an XX egg by a normal Y bearing sperm

13) The person with Turner' syndrome has _____.
   a) 44 autosomes and X sex chromosome
   b) 44 autosomes and XXX sex chromosomes
   c) 45 autosomes and XXX chromosomes
   d) 44 autosomes and XY sex chromosomes

14) Which law of Mendel is universally applicable?
   a) Law of dominance
   b) Law of segregation
   c) Law of independent assortment
   d) Law of unit factor

Q.2 A) Answer the following question. (Any Four) **08**
1) What is X-Iinked gene?
2) Define dihybrid cross.
3) Define Mitosis.
4) What is Spontaneous mutation?
5) What is Chromosomal aberrations?

B) Write Notes. (Any Two) **06**
1) Explain eye colour in *Drosophila.*
2) Describe Non homologous end joining (NHEJ).
3) Explain point mutation.

Q.3 A) Answer the following question. (Any Two) **08**
1) Explain in detail, steps involved in mitosis.
2) Explain Homologous recombination.
3) Describe in brief life cycle *S.cervisiae*

B) Answer the following questions. (Any One) **06**
1) What is mutation? What are its type and add note on mutagenic agents?
2) Describe incomplete dominance with suitable example.

Q.4 A) Answer the following questions. (Any Two) **10**
1) Describe in brief Gene mapping in Prokaryotes and Eukaryotes.
2) Explain in detail mismatch repair and add a note on dark repair.
3) Explain how multiple alleles are involved in rabbit fur colour.

B) Answer the following questions. (Any One) **04**

1) Explain general outline of genome of Neurospora crassa.
2) Describe in brief Colour blindness.

Q.5 Answer the following questions. (Any Two) **14**

1) Explain mutation related with chromosomal structure.
2) Explain, why prophase-I is important in meiosis.
3) Explain Transposon mediated mutagenesis.

SLR-JL-237

Seat No.	

Set P

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2019
Genetics
BIOSTATISTICS AND POPULATION GENETICS

Day & Date: Tuesday, 05-11-2019 Max. Marks: 70
Time: 11:30 AM To 02:00 PM

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

Q.1 Fill in the blanks by choosing correct alternatives given below. 14

1) Number of fruits in a tree is a _____ Variable.
   a) Discrete b) Absolute
   c) Continuous d) Quantitative

2) _____ is the fundamental statistical indicator.
   a) Median b) Mean
   c) Variance d) Variable

3) The student's T test is _____ test.
   a) Nonparametric b) Aparametric
   c) Parametric d) comparing variances

4) If mean of 6 number 41 then sum of these numbers is _____.
   a) 252 b) 250
   c) 248 d) 246

5) Distribution whose outliers are higher values is considered as _____.
   a) Right skewed b) Left skewed
   c) Variable model d) Constant model

6) The sum of the deviation about mean is always _____.
   a) Positive b) Zero
   c) Negative d) Total standard deviation

7) _____ of the following divides a group of data into four subgroups.
   a) Decile b) Percentile
   c) Quartile d) Standard Deviation

8) The total collection of gene at any one time in a population is called the _____.
   a) Demotype b) genotype
   c) multiple -allelic group d) Gene pool

9) Genetic drift occurs when a few individuals of a species colonize as island. This particular phenomenon is known as _____.
   a) The bottle neck effect b) The founder effect
   c) assertive mating d) Random mating

10) Microevolution can be measured by comparing observed allelic frequencies with those predicted by _____.
   a) Chance b) Hardy-Weinberg equation
   c) Mendelian ratio d) All known environmental factors

11) QTL analysis is used to identify _____.
   a) Identify RNA polymerase binding sites
   b) Map genes in bacterial viruses
   c) Determine which genes are expressed at development stage
   d) Identify chromosome regions associated with a complex trait in genetic cross

12) When subpopulations are geographically isolated from each other process is known as _____.
   a) allopatric speciation
   b) post mating isolations
   c) speciation
   d) premating isolations

13) Alternative forms of gene are called as _____.
   a) Loci
   b) multiples
   c) chromosomes
   d) alleles

14) Heredity or inheritance of specific traits became clearer due to _____.
   a) Lamarck theory
   b) Mendel worked on garden peas
   c) Darwinism
   d) Neo- Darwinism

Q.2 A) Answer the following questions. (Any Four) **08**

1) Enlist the uses of statistics.
2) Define sampling and give its type.
3) Define continuous variable.
4) Define panmixis.
5) Define Hardy-Weinberg's law.

B) Write Notes. (Any Two) **06**

1) Differentiate between diagram & graph
2) Explain genetic load and its types.
3) Explain random genetic drift.

Q.3 A) Answer the following questions. (Any Two) **08**

1) Explain essential features of table.
2) Explain Heritability and measurement of variability.
3) Explain Molecular aspect of speciation -speciation genes.

B) Answer the following questions. (Any One) **06**

1) Describe applications and uses of biostatistics.
2) Explain Post mating isolation.

Q.4 A) Answer the following questions. (Any Two) **10**

1) Explain Bar diagram with its type.
2) The weekly expenditure of 100 families are given below. Find the median weekly expenditure.

Expenditure	0-10	10-20	20-30	30-40	40-50
No. of Families	14	23	27	21	15

3) Explain Concepts of species and Models of speciation.

B) Answer the following questions. (Any One) **04**

1) The mean of 40 observations was 150. One of the observations wrongly taken as 125 instead of 165 during calculation of mean. Find the correct mean.
2) Explain Muller's view and Dobzhansky view for Origin of reproduction isolation.

Q.5 Answer the following questions. (Any Two) **14**

a) Calculate the median from following data containing student's marks in Genetics.

Marks	11-20	21-30	31-40	41-50	51-60	61-70	71-80
No. of students	42	38	125	84	45	36	30

b) Explain Statistical methods for QTL mapping.

c) Explain Estimation of breeding values and genetic variances in general pedigrees.

Seat No.	

Set **P**

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2019
Genetics
CYTOGENETIC AND GENOME ORGANIZATION

Day & Date: Thursday, 07-11-2019 Max. Marks: 70
Time: 11:30 AM To 02:00 PM

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

Q.1 Fill in the blanks by choosing correct alternatives given below. **14**

1) The XO system of sex determination is found in _____.
   a) Insects b) Birds
   c) Reptiles d) Mammals

2) _____ of the following will you expect plasmids to be absent.
   a) *Streptococcus* sp b) *Schizosaccharomyces pombe*
   c) *Drosophila* d) *Haemophilia*

3) _____ of the following plasmids for the definition of episomes.
   a) F factors b) R factors
   c) Col Factors d) RTF factors

4) _____ of the following is untrue about the genome mapping.
   a) It doesn't lead to the understanding a genome structure
   b) It involves identifying relative locations of genes
   c) It involves identifying traits
   d) It involves identifying mutations

5) Nucleosome was first described in 1974 by _____.
   a) William Asbury b) Rosalind Franklin
   c) Roger Kornberg d) John Crick

6) The extent of chromosome coiling in non - dividing cells is _____.
   a) Supercoiled b) Euchromatin
   c) Condensed d) Heterochromatin

7) _____ is a maternally inherited neurodegenerative disease in humans.
   a) Alzheimer's b) Parkinson's
   c) LHON d) Paralysis

8) The retroposons include short _____ interspersed nuclear elements (SINES).
   a) 90-4000 bp long b) 80-500 Mbp long
   c) 80-300 bp long d) 100-3000 bp long

9) _____ of the human genome comprises one particular family of the SINE Element, designated Alu (1.2 million copies).
   a) 10.7% b) 20.7%
   c) 60% d) 40%

10) _____ leads In formation of polytene chromosome.
   a) Endomitosis b) Meiosis
   c) Chromosomal aberration d) Gene duplication

11) _____ of the given features is incorrect.
   a) Transposable Elements (TE) are present in few particular chromosomes
   b) TEs are present in all of the chromosomes
   c) Abundance of TEs varies
   d) TEs can comprise a large portion of the genomes of higher eukaryotes, both plants and animals.

12) _____ of the following is a correct statement.
   a) Physical maps are constructed by using a chromosome walking technique
   b) Physical map does not use actual physical distance usually measured in number of base pairs
   c) Restriction mapping is not used for physical mapping
   d) Physical map does not illustrate the arrangement of gene on DNA

13) _____ of the following is true for *Drosophila sex* determination.
   a) Males are produced by presence of Y chromosome
   b) Females are produced by presence of Y chromosome
   c) Two X chromosome will always produce a female
   d) Two Y chromosome will always produce a male

14) _____ of the following is not true about plasmids.
   a) They are extra chromosomal DNA
   b) They are double stranded
   c) They confer antibiotic resistance
   d) They may get incorporated in chromosome

Q.2 A) Answer the following questions. (Any Four) **08**
   1) What is constitutive chromatin?
   2) What is consensus sequence?
   3) What is R banding?
   4) What are jumping genes?
   5) What is genic balance theory?

B) Write Notes. (Any Two) **06**
   1) Lamph brush chromosome
   2) Alu family
   3) Microsatellite

Q.3 A) Answer the following questions. (Any Two) **08**
   1) Describe gynandromorphs.
   2) What are LINEs?
   3) Describe cytoplasmic inheritance.

B) Answer the following questions. (Any One) **06**
   1) Describe the genome organization in animal cell.
   2) Describe chromosome structure and its organization.

Q.4 A) Answer the following questions. (Any Two) **10**
   1) What is C-value paradox?
   2) Describe plasmid as vector.
   3) Describe P-elements in *Drosophila*.

B) Answer the following questions. (Any One) **04**
   1) Describe properties of some well known plasmids.
   2) Describe the somatic cell hybridization.

Q.5 Answer the following questions. (Any Two) **14**

a) Describe G and C Chromosome banding and their applications.

b) Describe structure of gene in prokaryotes.

c) Describe the organization of nuclear and organelle genome.

SLR-JL-239

Seat No.	

Set P

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2019
Genetics
CELLULAR AND MOLECULAR BIOLOGY

Day & Date: Saturday, 09-11-2019 Max. Marks: 70
Time: 11:30 AM To 02:00 PM

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

Q.1 Fill in the blanks by choosing the correct alternatives given below: **14**

1) RNA polymerase III is located in _____.
   a) Cytoplasm b) nucleoplasm
   c) nucleolus d) mitochondria

2) _____ of the following polymers are not connected through covalent bonds.
   a) Peptide b) Glycogen
   c) DNA d) Microtubules

3) _____ is a common second messenger.
   a) cAMP b) cGTP
   c) cMHC d) cATP

4) G-proteins are _____.
   a) Homotrimeric b) hetero trimeric
   c) tetrameric d) pentameric

5) Essential components of eukaryotic cistron are _____.
   a) Introns b) exons
   c) operons d) Operator of regulatory genes

6) Glycosaminoglycan polysaccharides are found on serine and threonine residues in _____.
   a) Proteoglycans b) Collagens
   c) Laminins d) Elastins

7) _____ first confirmed that the replication of DNA was semi conservative.
   a) Chargaff and Hershey b) Watson and Crick
   c) Avery and Griffith d) Meselson and Stahl

8) Clover leaf model belongs to _____.
   a) tRNA b) DNA
   c) centriole d) flagella

9) _____ Enzyme is called mitochondrial polymerase and is encoded in the nucleus.
   a) DNA polymerase α b) DNA polymerase β
   c) DNA polymerase γ d) DNA polymerase δ

10) In NOTCH signaling pathway receptor is cleaved by _____ enzyme.
   a) alpha secretase b) gamma secretase
   c) beta secretase d) delta secretase

11) _____ of the following molecules helps entry of water inside the cell across a phospholipid bilayer.
a) hydroporins b) hydroxyporins
c) exportins d) aquaporins

12) _____ refers to a messenger RNA which encodes only one proteins.
a) Monocistronic mRNA b) Polycistronic mRNA
c) Unicistronic mRNA d) Polyreconic mRNA

13) _____ proposed the fluid mosaic model of cell membrane structure in 1972.
a) Davson and Singer b) Frye and Edidin
c) Brown and Goldstein d) Singer and Nicholson

14) A cell makes a signaling molecules and the receptor for that signaling molecule is present on neighboring cell, _____ is this mode of signaling termed.
a) Paracrine b) Endocrine
c) Autocrine d) Neuronal

Q.2 A) Answer the following questions. (Any Four) **08**
1) Active transport
2) Desmosomes
3) Replication
4) Cell cycle
5) RTKs

B) Answer the following questions. (Any Two) **06**
1) Write a note on Gap junction
2) Explain the Structure of tRNA
3) Give applications of RNAi

Q.3 A) Answer the following questions. (Any Two) **08**
1) Explain in detail termination of DNA replication in Prokaryotes.
2) Write an account Cell matrix interacting proteins.
3) Explain Structure and function of endoplasmic reticulum.

B) Answer the following questions. (Any One) **06**
1) Explain protein synthesis in eukaryotes.
2) Explain Wnt signaling pathway.

Q.4 A) Answer the following questions. (Any Two) **10**
1) Write an account of Transport of protein from ER to Golgi apparatus.
2) Explain the components of Extra cellular matrix and give functions.
3) Explain role of Ribozymes as gene silencing mediator.

B) Answer the following questions. (Any One) **04**
1) Explain fluid mosaic model of plasma membrane.
2) Write an account on cell – cell interacting junctions.

Q.5 Answer the following questions. (Any Two) **14**
a) Explain Ras-MAP Kinase pathway.
b) Explain the mechanism of mi RNA synthesis and its action in antisense technology.
c) Explain movement of molecule across cell membrane.

SLR-JL-241

Seat No.	

Set P

M.Sc. (Semester - II) (CBCS) Examination Oct/Nov-2019
Genetics
REGULATION OF GENE EXPRESSION AND DEVELOPMENTAL GENETICS

Day & Date: Monday, 04-11-2019 Max. Marks: 70
Time: 11:30 AM To 02:00 PM

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

Q.1 Fill in the blanks by choosing correct alternatives given below. 14

1) Metamorphosis is _____.
   a) Transformation of larva into adult
   b) development of animal without fertilization
   c) Sexual intercourse of male & female frog
   d) Fusion of male and female pronucleus

2) Cavity present inside the Coeloblastula is called as _____.
   a) Blastocoel b) segmentation cavity
   c) Coelom d) Archenteron

3) According to Gilchrist (1968), the prospective _____ is called "Zone of expansion" during gastrulation in frog.
   a) Ectodermal zone b) Endodermal zone
   c) Mesodermal zone d) Notochordal zone

4) In mRNA processing, at the $3'$ end of the primary transcript _____ takes place.
   a) introns b) 7-methylguanosine cap
   c) intergenic DNA d) polyadenylation

5) _____ region is act as binding site for transcription factors in eukaryotic gene regulation.
   a) Promoter b) Enhancer
   c) Silencer d) Operator

6) _____ enzyme is used for protein folding.
   a) Aminoacyl tRNA snythetase b) DNA glycosylase
   c) Peptidyl disulphide isomerase d) Peptidyl transfersae

7) In *trp* operom, *trpE* gene encodes _____ enzyme.
   a) Anthranilate synthetase component I
   b) Tryptophan synthetase β
   c) Tryptophan synthetase α
   d) Anthranilate synthetase component II

8) _____ is responsible for intron splicing.
   a) snRNA b) snoRNA
   c) siRNA d) miRNA

9) Guide RNA *(gRNA)* is responsible for addition of poly-U stretch during _____.
   a) RNA splicing b) Capping
   c) RNA editing d) Tailing

10) In the *trp* operon tryptophan is acts as _____.
   a) Inducer b) Repressor
   c) Apo-repressor d) Co-repressor

11) _____ gene is responsible for carpel development.
   a) *agamous*+ b) *apetalla 3*+
   c) *pistillata*+ d) *apetalla 2*+

12) In honey bee _____ system of sex determination is present.
   a) Haplo-diploidy b) XX-XY
   c) XX-XO d) ZZ-ZW

13) _____ is an example of pair rule gene in Drosophila.
   a) *hunchback*+ b) *hairy*+
   c) *biocoid*+ d) *Kruppel*+

14) _____ maternal gene product specifies the terminal parts development in *Drosophila*.
   a) P-granules b) Nanos protein
   c) Bicoid protein d) Torsolike protein

Q.2 A) Answer the following questions. (Any Four) **08**
1) What are activators?
2) Define specification.
3) What is transcriptional repressor?
4) Define blastema.
5) What is a Homeotic mutant in Arabidopsis?

B) Answer the following questions. (Any Two) **06**
1) Describe structure of *ara* operon.
2) Write note on regulation of viral promoters.
3) Give embryo sac development in Arabidopsis.

Q.3 A) Answer the following questions. (Any Two) **08**
1) Describe control of lysis and lysogeny in Lambda phage.
2) Describe regulation of Cell cycle.
3) Explain cleavage and blastula formation in frog.

B) Answer the following questions. (Any One) **06**
1) Describe Cell aggregation and differentiation in *Dictyostelium*.
2) Explain shoot and root development in Arabidopsis.

Q.4 A) Answer the following questions. (Any Two) **10**
1) Describe ABC model of floral development in *Arabidopsis*.
2) Describe vulva formation in *Caenorhabditis elegans*.
3) Describe double fertilization in *Arabidopsis*.

B) Answer the following questions. (Any One) **04**
1) Explain determination and differentiation with suitable examples.
2) Describe Post Translational modification of proteins.

Q.5 Answer the following questions. (Any Two) **14**
a) Explain eukaryotic gene regulation with any two suitable examples.
b) Describe structure and regulation of trp operon.
c) Explain anterio-posterior pattern formation in *Drosophila*.

SLR-JL-242

Seat No.	

Set P

M.Sc. (Semester - II) (CBCS) Examination Oct/Nov-2019
Genetics
CONCEPT OF BIOCHEMISTRY

Day & Date: Wednesday, 06-11-2019 Max. Marks: 70
Time: 11:30 AM To 02:00 PM

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

Q.1 Fill in the blanks by choosing correct alternatives given below. **14**

1) The phosphate and ribose group are donated by _____ during biosynthesis of nucleotides.
   a) orotate b) hypoxanthine
   c) HGPRT d) PRPP

2) The _____ phosphorylation refers to the use of light energy from photosynthesis to ultimately provide the energy to convert ADP to ATP.
   a) oxidative b) substrate level
   c) photo d) protein

3) A thermodynamic reaction cannot occur spontaneously only if the ΔG is _____.
   a) positive b) constant
   c) negative d) maximum

4) An agent that dissociates two integrated series of chemical reactions is known as an _____.
   a) inhibitor b) initiator
   c) promoter d) uncoupler

5) Bonds between carbon and nitrogen are represented by _____ angles in the Ramchandran's plot.
   a) phi b) psi
   c) rho d) sigma

6) Eleveted levels of _____ is used as a diagnostic tool for pregnancy test.
   a) GIH b) HCG
   c) TSH d) ADH

7) Condensation of fructose 6 phosphate with UDP glucose in plants results in biosynthesis of _____.
   a) starch b) cellulose
   c) lactose d) sucrose

8) Synthesis of glucose molecule from noncarbon or inorganic source is the _____.
   a) glycolysis b) glycogenesis
   c) glycogenolysis d) gluconeogenesis

9) The _____ are commonly observed complex lipids in the membranes of nerve cells.
   a) glycoproteins b) steroids
   c) sphingolipids d) bile salts

10) The _____ is minimum barrier required to be crossed for completion of catalysis.
a) entropy b) enthalpy
c) Gibbs free energy d) activation energy

11) The _____ inhibition cannot be overcome by increasing the substrate concentration.
a) competitive b) noncompetitive
c) uncompetitive d) irreversible

12) By the action of transketolase & transaldolase, the _____ pathway is linked to glycolysis.
a) C3 b) HMP
c) TCA d) C4

13) The furanose structure of sugars contain _____ number of carbon atoms in its structure.
a) eight b) seven
c) six d) five

14) Bile salts derived from _____ facilitate digestion of lipids.
a) cholesterol b) glycerol
c) palmitate d) acetyl COA

Q.2 A) Answer the following questions. (Any Four) **08**
1) State Second law of thermodynamics. What is free energy?
2) Write biological role of thiamine.
3) Draw a labeled diagram of Ramchandran plot.
4) Define enzyme activity and specific activity.
5) What is difference between cyclic and noncyclic photophosphorylation?

B) Write Notes. (Any Two) **06**
1) Define lipid. State general properties of lipids.
2) State functions of proteins.
3) Explain ultrastructure of mitochondria.

Q.3 A) Answer the following questions. (Any Two) **08**
1) Explain mechanism of enzyme action.
2) Describe structure of ATPase.
3) Give classification of amino acids with examples.

B) Answer the following questions. (Any One) **06**
1) Describe classification of enzymes with examples.
2) Describe the Pentose phosphate pathway.

Q.4 A) Answer the following questions. (Any Two) **10**
1) Describe types of reversible enzyme inhibition.
2) Write a note on cori cycle.
3) Describe the general reactions of amino acid metabolism.

B) Answer the following questions. (Any One) **04**
1) Describe secondary structure of protein.
2) Describe ATP as energy rich compound.

Q.5 Answer the following questions. (Any Two) **14**
a) Describe structure of glycogen and the mechanism of its degradation.
b) Explain an outline for the modes of nucleotide biosynthesis.
c) Derive the michalis menten equation. State significance of Km and Vmax.

SLR-JL-243

Seat No.	

Set P

M.Sc. (Semester - II) (CBCS) Examination Oct/Nov-2019
Genetics
ADVANCED MICROBIAL GENETICS

Day & Date: Friday, 08-11-2019 Max. Marks: 70
Time: 11:30 AM To 02:00 PM

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

Q.1 Fill in the blanks by choosing correct alternatives given below. **14**

1) _____ DNA molecules are transferred after each transformation.
   a) 2 b) 1
   c) 50 d) Infinite

2) _____ among the following species have not been transformed.
   a) Bacillus b) Neisseria
   c) Rhizobium d) Aspergillus

3) Transduction was discovered by _____.
   a) Iwanowsky b) Zinder and Lederberg
   c) Woolman and Hayes d) Griffith

4) When Hfr stains of *E.coli* is crossed with F strain, recombinants obtained are _____.
   a) always F^+ b) always Hfr^+
   c) rarely F+ d) rarely HFr

5) In yeast the mating type is controlled by alleles of single gene locus referred to as _____.
   a) MAZ loci b) AMP loci
   c) MAP loci d) MAT loci

6) _____ is used for production of critic acid.
   a) *Lactococcus lactis* b) *Aspergillus niger*
   c) *Srepttococcus mutans* d) Both a and b

7) The process of self-fertilization in fungi is known as _____.
   a) automixis b) amphimixis
   c) spermatization d) somatogamy

8) The bacterial strain requiring amino acid supplements for growth is termed as _____.
   a) Oligotrophy b) Auxotroph
   c) Prototroph d) Autotroph

9) Riboflavin is produced industrially by _____.
   a) *Ashbya gossypii* b) *Fusarium venenatum*
   c) *Monoascus purpureus* d) *Lactococcus lactis*

10) _____ method is used for isolation of drug resistant mutants.
   a) Plaque counting b) Colony isolation
   c) Replica plating d) Induction

11) Specialized Transduction is mediated by _____.
   a) lytic phages b) lysogenic phages
   c) T 4 phages d) none of these

12) _____ yeast strains can switch mating type.
   a) Homothallic b) Heterothallic
   c) Homozygous d) Heterozygous

13) The partial diploids formed as a result of sexual reproduction in bacteria is termed as _____.
   a) zygotes b) haplozygotes
   c) prozygote d) merozygote

14) Spontaneous mutations on the molecular level can be caused by _____.
   a) tautomerism b) depurination
   c) deamination d) all of these

Q.2 A) Answer the following questions. (Any Four) **08**
1) What is complete media?
2) What is temporal mapping?
3) How F 'cell is formed?
4) Give significance of Ori c.
5) What are virulent phages?

B) Write Notes. (Any Two) **06**
1) Merozygotes
2) Auxotrophs
3) HFr

Q.3 A) Answer the following questions. (Any Two) **08**
1) Take an account on Fungi in nature.
2) Describe life cycle of virulent phages.
3) Explain in detail temporal mapping.

B) Answer the following questions. (Any One) **06**
1) Explain Griffith's experiment and add a note on transformation.
2) Describe in detail the process of gene transfer by HFr strains.

Q.4 A) Answer the following questions. (Any Two) **10**
1) Explain methods of artificial induction of competency.
2) Describe in detail various phases of fungal life cycle.
3) Explain analysis of mutation in biochemical pathway.

B) Answer the following questions. (Any One) **04**
1) Discuss in brief discovery of conjugation and mechanism of chromosome transfer.
2) Explain p22 mediated transduction.

Q.5 Answer the following questions. (Any two) **14**
1) Describe fluctuation test.
2) Explain map of F plasmid and its transfer into host.
3) Write on temperate Yeast matting type switching mechanism.

SLR-JL-245

Seat No.	

Set P

M.Sc. (Semester - III) (CBCS) Examination Oct/Nov-2019
Genetics
IMMUNOLOGY & IMMUNOTECHNOLOGY

Day & Date: Monday, 18-11-2019 Max. Marks: 70
Time: 03:00 PM To 05:30 PM

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

Q.1 Fill in the blanks by choosing correct alternatives given below. **14**

1) In the secondary immune response _____ antibody is predominant.
   a) IgG b) IgM
   c) IgE d) IgD

2) Mature antibody-secreting cells are called _____.
   a) plasma cells b) T cells
   c) immunoblasts d) neutrophils

3) The major function of class I MHC gene products is presentation of peptide-antigen to _____ cells.
   a) T_H b) Tc
   c) Ts d) B

4) Tumor cells are self altered cells, which are destroyed in _____ immune response.
   a) Cell mediated b) humoral
   c) primary d) secondary

5) Erythroblastosis fetalis, hemolytic disease of the newborn is called by _____ hypersensitivity.
   a) Type I b) Type II
   c) Type III d) Type IV

6) Serum sickness is example o _____ Hypersensitivity.
   a) IgE dependent b) Delayed
   c) Antibody dependent cytotoxic d) immune complex mediated

7) TAB vaccine is example of _____ vaccine.
   a) live b) killed
   c) subunit d) toxoid

8) The _____ plays a major role in mounting immune response to antigens in the blood stream.
   a) spleen b) lymph node
   c) thymus d) bone marrow

9) The mucosa-associated lymphoid tissue is ____.
   a) spleen b) lymph node
   c) thymus d) peyer's patches

10) C1 complement is synthesized in _____.
a) spleen b) liver
c) macrophages d) intestinal epithelium

11) Antigen showing immunogenicity and immunological reactivity are _____.
a) Complete antigens b) Incomplete antigens
c) Haptens d) Adjuvants

12) _____ is most likely to induce a strong immune response.
a) Nucleic acid b) Glycolipid
c) Phospholipid d) Glycoprotein

13) Most carbohydrate containing antibody is _____.
a) IgD b) IgG
c) None of these d) IgA

14) Widal test is example of _____ test.
a) precipitation b) agglutination
c) immune-electrophoresis d) RIA

Q.2 A) Answer the following questions. (Any Four) **08**
1) Write on types of acquired immunity with examples.
2) Write on components of complement system.
3) Give functions if IgG and IgM.
4) What are different types of transplants?
5) Write in short about flow cytometry.

B) Write Notes. (Any Two) **06**
1) NK cells
2) IgM
3) Inflammation

Q.3 A) Answer the following questions. (Any Two) **08**
1) Describe mechanism of phagocytosis.
2) Write on structure and functions of spleen.
3) Discuss T Cell maturation, activation and differentiation.

B) Answer the following questions. (Any Two) **06**
1) Write on MHC molecules and gene organization.
2) Describe complement fixation by classical pathway.
3) How antigen is processed and presented by the immune cells.

Q.4 A) Answer the following questions. (Any Two) **10**
1) Write on structure and functions of IgA.
2) What are monoclonal antibodies? Give its applications.
3) Explain delayed type hypersensitivity with examples.

B) Answer the following questions. (Any One) **04**
1) Discuss on immunosuppressive therapy.
2) Write on killed and attenuated vaccines with examples.

Q.5 Answer the following questions. (Any Two) **14**
a) Describe in detail the mechanism and application of complement fixation.
b) Discuss AIDS with respect to diagnosis, control and treatment.
c) Explain the mechanism and applications of RIA.

SLR-JL-246

Seat No.	

Set P

M.Sc. (Semester - III) (CBCS) Examination Oct/Nov-2019
Genetics
GENETIC ENGINEERING

Day & Date: Tuesday, 05-11-2019 Max. Marks: 70
Time: 03:00 PM To 05:30 PM

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

Q.1 Fill in the blanks by choosing correct alternatives given below. **14**

1) _____ will be the transcription product of 3'....AUCCGAGCUAAC....5' when treated with reverse transcriptase.
   a) 3'.... GTTAGCTCGGAT....5' b) 3'....AUCCGAGGAUUG ….5'
   c) 5'....GTTAGCTCGGAT....3' d) 5'....UAGGCUCGAUUG....3'

2) $\lambda_{gt}10$ vector can propagate cloned fragments up to _____.
   a) 20-25 kb b) 6-7 kbc
   c) 10-20 kb d) 15-20 kb

3) All the following are thermostable polymerases except _____.
   a) Taq polymerase b) Pfu polymerase
   c) DNA polymerase III d) Vent polymerase

4) The term 'endonuclease' refers to cutting the DNA sequence from.
   a) Exactly in the middle of the chain
   b) The ends of the chain
   c) Anywhere in the chain
   d) Only within the polynucleotide chain, not at the ends

5) Which of the following is not a function of reverse transcriptase?
   a) Exonuclease
   b) RNA dependent DNA polymerase
   c) RNase H
   d) DNA dependent DNA polymerase

6) Maximum size of foreign DNA that can be inserted into a replacement vector is _____.
   a) 25-30 kb b) 20-25 kbc
   c) 18-20 kb d) 40-50 kb

7) The variation in the restriction DNA fragment lengths between individuals of a species is called _____.
   a) AFLP b) RAPD
   c) RFLP d) PCR

8) Type II cuts the sequence in the following way _____.
   a) At 100-1000 nucleotides away from the recognition sequence
   b) It cuts randomly
   c) At 27-30 nucleotides away from the recognition sequence
   d) Within the recognition sequence

9) Autonomously Replicating Sequences (ARS) is characteristic feature of _____.
   a) Yeast vector b) Cosmid vector
   c) Phage vector d) plasmid vector

10) Which of the following is not true about phagemids?
   a) Contain λ att site
   b) Can only propagated as phage
   c) Contain functional Ori of plasmid & λ phage
   d) may be propagated as a plasmid or as phage in appropriate strain

11) How can one end be protected from the action of Exonuclease III, so that the molecule is not shortened from both the ends?
   a) By labelling one end with a radioactive compound
   b) By making both the ends double stranded in nature
   c) By using Phosphorothioate nucleotide analogue
   d) By increasing the time of exposure of the DNA molecule to the enzyme

12) _____ of the following has Cuboidal Crystal shape.
   a) Endotoxin A b) CRY I(mini)
   c) CRI II(polygroup) d) CRY II(Subgroup)

13) In Site specific mutagenesis of the cloned hGH _____ was used to changed sme of the amino acids.
   a) c DNA b) tRNA
   c) mRNA d) DNA

14) Interferon a family is coded by _____ number of genes.
   a) 10 b) 13
   c) 11 d) 14

Q.2 A) Attempt any four of the following question. **08**
1) Define genomic DNA probes.
2) Define Phagemid
3) Define alkaline phosphatases & Kinases.
4) Define shuttle vector.
5) Define Indirect screening.

B) Write Notes. (Any Two) **06**
1) Write a note on human interferon production.
2) Write a note on isolation of vector.
3) Write a note on PEG mediated gene transfer.

Q.3 A) Attempt any two of the following question. **08**
1) Discuss development of transgenic sheep.
2) Explain in detail T_4 polynucleotide Kinase.
3) Describe colony Hybridization technique.

B) Attempt any one of the following question. **06**
1) Describe the method for modification of food plant test (sweetness).
2) Discuss various methods used for purification of donor DNA.

Q.4 A) Attempt any two of the following question. **10**
1) Discuss Inverse PCR.
2) Describe microinjection method of gene transfer with its application, advantages & limitations
3) Explain YAC vector.

B) Attempt any one of the following question. **04**

1) Describe Diagnosis of Sickle Cell Anemia.
2) Describe Taq DNA polymerase.

Q.5 Attempt any two of the following question. **14**

a) Explain in detail AFLP as molecular Marker.
b) Describe automated DNA sequencing method.
c) Discuss transgenic mice.

SLR-JL-247

Seat No.	

Set P

M.Sc. (Semester - III) (CBCS) Examination Oct/Nov-2019
Genetics
MOLECULAR MEDICINE

Day & Date: Thursday, 07-11-2019 Max. Marks: 70
Time: 03:00 PM To 05:30 PM

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

Q.1 Fill in the blanks by choosing correct alternatives given below. **14**

1) HGP was also focused on identifying _____.
   a) SNPs b) VNTRs
   c) Minisatellites d) Junk DNA

2) _____of the following vectors are used in HGP.
   a) Plasmid and cosmid
   b) Lambda Phage and M13 vectors
   c) Phagemid & shuttle vectors
   d) BAC & YAC

3) The short DNA fragments that are placed in microarray are called as _____.
   a) Markers b) Probes
   c) mRNA d) Test sequences

4) The introduction of remedial gene to bone marrow cell is known as _____.
   a) Germ line therapy b) Somatic cell therapy
   c) Corrective gene therapy d) Human gene therapy

5) The gammaglobelinemia is caused due to mutation in _____.
   a) CFTR b) AGL
   c) PKA d) BTK

6) The process in which one stem cell develops into two different daughter cells is called as _____.
   a) Differentiation b) Division
   c) Dedifferentiation d) None of these

7) Sweat chlorides are increased in _____.
   a) Addisons disease b) Conn's syndrome
   c) Cystic fibrosis d) Phacochromacytoma

8) The β-globulin gene mutation leads to a blood diseases known as _____.
   a) Sickle cell anemia b) Phenylketonuria
   c) Haemophilia d) Turner's syndrome

9) Stromal cells are _____cells.
   a) Nerve cells b) Stem cells
   c) Nutritive cells d) B cells

10) _____of the following is most controversial approach in gene therapy.
   a) Germ line therapy b) Somatic therapy
   c) Ex-vivo therapy d) Antisense therapy

11) Stem cells are present in _____.
   a) Unicellular organism b) Multicellular
   c) Viruses d) Nonliving things

12) SCID stands for _____.
   a) Severe combined Immuno diagnosis
   b) Semi combined immune disease
   c) Severe combined Immuno deficiency
   d) Severe common Immuno deficiency

13) The human genome project was initiated by _____.
   a) NIH and EBI b) NIH and DOE
   c) DOE and DDBI d) NIH and DDBI

14) Huntington's disease is an inherited disease that causes the progressive breakdown of _____cells.
   a) Muscle cells b) Nerve cells
   c) Hepatocytes d) Epithelial cells

Q.2 A) Answer any four of the following questions. **08**

1) Define Totipotency.
2) Applications of tissue engineering.
3) Define Retroviruses and give its examples.
4) Define Amniocentesis and its use.
5) Define Positional cloning.

B) Answer any two of the followings. **06**

1) Explain chorionic villus sampling.
2) Explain Down's syndrome.
3) Explain regenerative medicines.

Q.3 A) Answer any one of the followings. **08**

1) Explain Gene therapy and its types.
2) Explain stem cell, its types and functions.
3) Explain Phenylketonuria with defect in biochemical pathway.

B) Answer any one of the followings. **06**

1) Explain in different steps involved drug discovery.
2) Explain in detail DNA foot printing.

Q.4 A) Answer any two of the followings. **10**

1) Explain in detail pharmacogenetics with its application.
2) Explain types of viruses used in gene therapy.
3) Explain Duncchene Muscular dystrophy.

B) Answer any one of the followings. **04**

1) Explain in detail Human genome project.
2) Explain properties and function of mesenchymal cells.

Q.5 Answer any two of the followings. **14**

1) Explain Bioavailability of drugs and its effectiveness during target drug delivery.
2) Explain DNA microarray.
3) Explain vector and non vector mediated gene therapy.

SLR-JL-249

Seat No.	

Set P

M.Sc. (Semester - IV) (CBCS) Examination Oct/Nov-2019
Genetics
CANCER GENETICS AND STEM CELL RESERACH

Day & Date: Monday, 04-11-2019 Max. Marks: 70
Time: 03:00 PM To 05:30 PM

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

Q.1 Fill in the blanks by choosing correct alternatives given below. **14**

1) _____ is not a tumor suppressor gene.
   a) $p53$ b) Rb
   c) $INK4$ d) $ERBB2$

2) A stem cell transplant using a patient's own stem cells is described as _____.
   a) Syngenic b) Autologous
   c) Allogeneic d) Non Autologous

3) The process whereby cells or tissue are frozen is called _____.
   a) Cryopreservation b) Cryoprotection
   c) Lyophilization d) Freezing

4) _____cells can differentiate into a few different cell types.
   a) Oligopotent b) Unipotent
   c) Pluripotent d) Multipotent

5) _____ is oncogene.
   a) Bcl-2 b) BTK
   c) cyp450 d) Hsp-60

6) Study of gene regulation is known as _____.
   a) genetics b) epigenetics
   c) transcription d) Gene expression

7) _____ chemical is used to culture the stem cells.
   a) E-Adherin b) E-cathedrin
   c) E-cadherin d) E-cadrin

8) _____ is not a proto-oncogene.
   a) KRAS b) BRAF
   c) INK4 d) cyclin E

9) DNA methylation occurs at _____ site.
   a) ApG b) TpG
   c) GpC d) CpG

10) _____ disease is not cured by using stem cell.
   a) Arthritis b) Stroke
   c) Diabetes d) Leprosy

11) Study of cancer-associated genes is called _____.
   a) oncogenomics b) epigenetics
   c) oncogences d) epigenomics

12) _____ chemical is used to culture the stem cells.
a) Melanin b) Kinetin
c) Creatin d) Laminin

13) The word “embryonic stem cell” was first coined by _____.
a) David Thomson b) Gail Martin
c) Luis Albert d) Robert Brown

14) ____can be used to print tissues and organs to help research drugs and pills.
a) Bioprinting b) Biomachine
c) 3D printing d) Tissue printing

Q.2 A) Answer the following questions. (Any Four) **08**
1) What is morphogenesis?
2) Enlist the anti-viral drugs.
3) What is the role of extracellular matrix in stem cell culture?
4) What is RAS protein?
5) What are mESCs?

B) Write Notes on. (Any Two) **06**
1) Write note on bioartificial pancreas.
2) Write note on primary cell culture.
3) Write note on characteristic features of cancer cell.

Q.3 A) Answer the following questions. (Any Two) **08**
1) Give account on metastatic cascade.
2) Give account on radiation therapy in cancer therapy.
3) Write a note on characterization of stem cell.

B) Write Notes on. (Any One) **06**
1) Write note on types of stem cells.
2) Explain modes of cell and tissue delivery.

Q.4 A) Answer the following questions. (Any Two) **10**
1) Explain the types of epigenetic modifications.
2) Explain stem cell transplantation technique.
3) Explain the use of immunotoxins in cancer therapy.

B) Answer the following questions. (Any One) **04**
1) Describe the physical and chemical carcinogens.
2) Explain the regeneration of bone and cartilage.

Q.5 Answer the following questions. (Any Two) **14**
a) Explain the methods of diagnosis of cancer.
b) What are the issues around stem cells and add a note on safety & side-effects.
c) Explain applications of stem cells.

SLR-JL-250

Seat No.	

Set P

M.Sc. (Semester - IV) (CBCS) Examination Oct/Nov-2019
Genetics
ANALYTICAL INSTRUMENTS AND TECHNIQUES

Day & Date: Wednesday, 06-11-2019 Max. Marks: 70
Time: 03:00 PM To 05:30 PM

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

Q.1 Fill in the blanks by choosing correct alternatives given below. **14**

1) When the power of ocular lens is 10 X and objective lens is 20 X, the magnification is _____.
   a) 30 times b) 20 times
   c) 200 times d) 2000 times

2) _____ of the following is used in electron microscope.
   a) electron beams
   b) magnetic fields
   c) light waves
   d) electron beams and magnetic fields

3) In X-ray spectrometers, the specimen or the sample is placed in _____ of the following components.
   a) X-ray tube b) Monochromator
   c) Collimator d) Detector

4) Beer's law states that the intensity of light decreases with respect to _____.
   a) Concentration b) Distance
   c) Composition d) Volume

5) NMR is the study of absorption of _____ by nuclei in a magnetic field.
   a) Radioactive radiation b) IR radiation
   c) Radio frequency radiation d) Microwaves

6) Number of protons in an atom determines_____.
   a) chemical properties b) physical properties
   c) magnetic properties d) electrical properties

7) Types of radiations emitted by radioactive substance are _____.
   a) 2 b) 4
   c) 5 d) 3

8) In liquid scintillation counter, _____ of the following is a fluorescent substance.
   a) Solvent b) Solute
   c) Crystal d) Reagent

9) Electrophoresis was developed by _____.
   a) Tswett b) Tsvedberg
   c) Tiselius d) Sanger

10) If proteins are separated according to their electrophoretic mobility then the type of electrophoresis is _____.
a) SDSPAGE b) Affinity Electrophoresis
c) Electro focusing d) Free flow electrophoresis

11) In _____ type of chromatography, the stationary phase held in a narrow tube and the mobile phase is forced through it under pressure.
a) Column chromatography b) Paper chromatography
c) Liquid chromatography d) Gas chromatography

12) In Thin layer chromatography, the stationary phase is made of _____ and the mobile phase is made of _____.
a) Solid, liquid b) Liquid, liquid
c) Liquid, gas d) Solid, gas

13) Radioactive particles give off _____.
a) waves b) rays
c) energy d) light

14) In Atomic Absorption Spectroscopy, _____ of the following is the generally used radiation source.
a) Tungsten lamp
b) Xenon mercury arc lamp
c) Hydrogen or deuterium discharge lamp
d) Hollow cathode lamp

Q.2 A) Answer the following. (Any Four) **08**
1) Give any two applications of Dot blotting.
2) Give Factors affecting electrophoretic mobility.
3) Enlist steps involved in Synthesis of radioactive labeled compounds.
4) Define Fluorescence microscope and its anyone application.
5) Applications of Radioisotopes in Biological Sciences.

B) Answer the following. (Any Two) **06**
1) Define Principle, and applications of Liquid Chromatography- Mass Spectrometry (LCMS).
2) Explain principle, procedure and application of Western Blotting technique.
3) Explain principle, procedure and application of SDS-PAGE.

Q.3 A) Answer the following. (Any Two) **08**
1) Give principle of any four Types of Microscopes.
2) Explain principle and application of Native PAGE.
3) Explain Column Chromatography.

B) Answer the following. (Any One) **06**
1) Explain Basic principle of electrophoresis and Factors affecting electrophoretic mobility.
2) Explain Solid Scintillation counting and Liquid Scintillation counting.

Q.4 A) Answer the following. (Any Two) **10**
1) Explain principle, instrumentation and application Atomic Absorption Spectroscopy.
2) Principle, procedure and applications of Affinity chromatography with example.
3) Explain Image formation by compound light microscope & electron microscope.

B) Answer the following. (Any One) **04**

1) Explain Gas Chromatography- Mass Spectrometry(GCMS).
2) Explain Paper Chromatography.

Q.5 Answer the following (Any two) **14**

1) Explain principle, instrumentation & applications of Colorimetry.

2) Explain - principle, instrumentation & applications Scanning electron Microscopy.

3) Explain in detail Autoradiography.

SLR-JL-251

Seat No.	

Set P

M.Sc. (Semester - IV) (CBCS) Examination Oct/Nov-2019
Genetics
AGRICULTURE SCIENCE AND SEED TECHNOLOGY

Day & Date: Friday, 08-11-2019 Max. Marks: 70
Time: 03:00 PM To 05:30 PM

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

Q.1 Fill in the blanks by choosing correct alternatives given below. **14**

1) Bending of plant shoot towards light is called as _____.
   a) Autotropism b) Gravotropism
   c) Xerotropism d) Phototropism

2) Absorption of water by a solid substance for its swelling is called _____.
   a) Osmosis b) Imbibition
   c) Guttation d) Diffusion

3) Azolla is _____ which is used for green manuaring.
   a) Orchid b) Fern
   c) Mangrove d) Blue-green algae

4) _____ hormone is responsible for bud and seeds dormancy.
   a) Abscisic acid b) Cytokinine
   c) Auxin d) Gibberellin

5) The pressure developed within the protoplasm to stretch the cell wall is called _____.
   a) Adsorption b) Turgor pressure
   c) Water potential d) Water force

6) Black soil is also called as _____.
   a) Ground nut soil b) Rice soil
   c) Mango soil d) Cotton soil

7) Programed cell death is scientifically known as _____.
   a) Automy b) Cell lysis
   c) Apoptosis d) None of these

8) The term phytochrome was introduced by _____.
   a) Borthwick b) Borthwick and Hendricks
   c) Moore d) Garner and Allard

9) Seed dormancy can be broken by _____.
   a) ABA and ethylene b) Auxin and GA
   c) GA and cytokinin d) Auxin and ABA

10) Metabolic precursor for the synthesis of ethylene is _____.
   a) Citric acid b) α –ketoglutaric acid
   c) Succinic acid d) Methionine

11) Ripening of fruits can be fastened by treatment of _____.
   a) GA b) Cytokinin
   c) Ethylene d) Auxin

12) _____ is a long day plant.
   a) Cocklebur
   b) Biloxy variety of soyabean
   c) Maryland mammoth variety of tobacco
   d) Black henbane

13) Jasmonate plays role in _____.
   a) Inhibition of growth of plants
   b) Enhancement of growth of plants
   c) Root initiation
   d) Breaking of seed dormancy

14) CCC is inhibitor of _____.
   a) GA biosynthesis
   b) Auxin biosynthesis
   c) Kinetin biosynthesis
   d) None of the above

Q.2 A) Answer the following questions. (Any Four) **08**
1) What is phytochrome?
2) Define senescence.
3) What is vernalization?
4) Define plant growth regulators.
5) What is soil capacity?

B) Write Notes. (Any Two) **06**
1) Describe Cryptochrome
2) Give an account on Biominearlization.
3) Explain Metabolism of stored seeds.

Q.3 A) Answer the following questions. (Any Two) **08**
1) Describe the biochemical changes during petal senescence.
2) Add a note on seed testing.
3) Explain importance of Nitrogen, Phosphorus and potassium in plant growth.

B) Write Notes. (Any One) **06**
1) Describe fruit ripening process in brief.
2) Give an account of discovery, properties and role of phytochrome in plants.

Q.4 A) Answer the following questions. (Any Two) **10**
1) Describe in brief seed certification.
2) Describe relationship between plant and animal husbandry.
3) Describe soil types of India.

B) Write Notes. (Any One) **04**
1) Describe in brief Biocomposting.
2) Explain photorespiration.

Q.5 Answer the following questions. (Any Two) **14**
a) Explain mineral deficiencies and their symptoms in details.
b) Add a note on ‘Auxin transport’.
c) Describe the role of microorganisms in soil fertility.

SLR-JL-252

Seat No.	

Set P

M.Sc. (Semester - IV) (CBCS) Examination Oct/Nov-2019
Genetics
RESEARCH METHODOLOGY AND SCIENTIFIC REPORT WRITING AND IPR

Day & Date: Monday, 11-11-2019 Max. Marks: 70
Time: 03:00 PM To 05:30 PM

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

Q.1 Fill in the blanks by choosing correct alternatives given below. 14

1) _____ of the following is the first step in starting the research process.
   a) Searching sources of information to locale problem
   b) Identification of problem
   c) Survey of related literature
   d) Searching of solution to the problem

2) Mean, Median and mode are _____.
   a) Measures of deviations C b) Ways of sampling
   c) Measures of control tendency d) None of above

3) In the process of conducting research 'Formulation of hypothesis' is followed by _____.
   a) Statement of objectives b) Analysis of data
   c) Selection of research tool d) Collection of data

4) _____ of the following variables cannot be expressed in quantitative terms.
   a) Numerical aptitude b) Socio economic status
   c) Marital status d) Professional attitude

5) ANOVA was developed by statistician and evolutionary biologist _____.
   a) Ronald Fisher b) Watsun Fisher
   c) Jerzy Neyman d) Jerzy Fisher

6) Cost effectiveness of primary data is _____.
   a) Economic b) Within range
   c) Expensive d) Not confirmed

7) A Scientific method is preferred to thesis writing because it is _____.
   a) Reliable b) Systematic
   c) Accurate d) All of above

8) _____ should be chapter 1st inthesis writing as per university rules.
   a) Review of literature b) Results and discussion
   c) Introduction d) Materials and methodology

9) Geographical indications is a _____.
   a) Private right b) Community right
   c) IPR d) Both b and c

10) Intellectual property rights protect the use of information and ideas that are of _____ value.
a) Commercial b) Ethical
c) Moral d) Social

11) _____ of the following is geographical indications.
a) BMW b) Champagne
c) Play station d) World wide web

12) UPOV stands for _____.
a) International union for protection of new variety of plants
b) United policy of protection of new plant variety
c) National union for protection of new variety of plants
d) United policy of protection of variety of plants

13) The plant variety protected in India includes _____.
a) Explants variety b) Essential derived variety
c) Farmers variety d) All of Above

14) Patenting genetic resources may leads to _____.
a) Conservation of biodiversity b) Protection of biodiversity
c) Destruction of biodiversity d) All of Above

Q.2 A) Answer the following questions. (Any Four) **08**
1) What is the importance of research?
2) What are advantages of sample theory?
3) Tell uses of figures in research paper.
4) Define trade Secrete.
5) Give objectives of research.

B) Write notes. (Any Two) **06**
1) Copyright
2) Account on the primary data
3) Patent

Q.3 A) Answer the following questions. (Any Two) **08**
1) Brief account on Chi square test.
2) Review of literature.
3) Write in short use of Audio-Visual aids in presentation.

B) Answer the following questions. (Any One) **06**
1) Brief account of testing of significance of mean.
2) Describe farmers right with respect to PBR.

Q.4 A) Answer the following questions. (Any Two) **10**
1) Geographical indications.
2) Give an account on Intellectual property rights.
3) Describe the methods of data collection.

B) Answer the following questions. (Any One) **04**
1) Use of computer and Internet in research.
2) Steps involved in thesis writing.

Q.5 Answer the following questions. (Any Two) **14**
a) Types and steps in sampling.
b) Write an account of preparation of manuscript for publication in national international journals.
c) Describe the patenting procedure in India.