Section – I Rewrite the following sentences by using correct alternatives: 1) Polytene chromosome first time observed by b) Painter c) Bridige d) Both a & b Stage. b) Zygotene d) Pachytene Mutation. b) Deletion d) Inversion b) Somatic gene d) Hemizygous

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017 Genetics **CONCEPTS OF GENETICS**

Day & Date: Thursday, 16-11-2017 Time: 10.30 AM to 1.00 PM

Seat

No.

Instructions: 1) Section-I is compulsory.

- 2) From Section-II attempt any four.
- 3) All questions carry equal marks.
- 4) Figures to right indicate full marks.
- 5) Draw neat and labeled diagrams.

Q.1 A)

- - a) Balbiani
- 2) Which one of the following statements is not true about meiosis?
 - a) Meiosis occurs in reproductive cells.
 - b) Meiosis results in four haploid daughter cells.
 - c) In meiosis, chromosomes do not exchange genetic material
 - d) In meiosis, homologous pairs of chromosomes are pulled apart
- Crossing over occurs during _____
 - a) Metaphase
 - c) Prophase II
- 4) Failure of chromosomes to separate during meiosis is example of
 - a) Nondisjunction
 - c) Freamshift
- 5) The gene present on non-homologous region of Y-chromosome is called as

b) Guanine dimmers

d) Urasil dimmers

d) Red

- a) Holandric gene
- c) Recessive gene
- ____ is formed by UV radiation. 6)
 - a) Adenine dimmers
 - c) Thymine dimmers
- In Chinchilla fur colour, _____ Pigmentation is absent. b) Yellow
 - a) White
 - c) Black

B) Answer the following terms.

- a) Synapsis.
- **b)** Meiosis.
- c) Recombination.
- d) X-linked.
- e) Back cross.
- f) Aneuploidy.
- g) Interphase.

07

SLR-MK-418

Set

Max. Marks: 70

07

Section – II

Q.2	Attempt any four: Explain in detail: Events involved in somatic cell division.	14
Q.3	Describe X-linked inheritance with suitable example.	14
Q.4	Explain monohybrid and dihybrid crosses with suitable example.	14
Q.5	 Answer any <i>TWO</i> of the following: a) Add a note on complete linkage and incomplete linkage. b) Describe life cycle of Human. c) Add a note on Haemophilia. 	14
Q.6	 Answer any <i>TWO</i> of the following: a) Describe Synapsis of meiotic Crossing Over. b) Explain Induced mutations. c) Write a short on Mismatch repair in <i>E. coli</i>. 	14

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017

Genetics **BIOSTATISTICS AND POPULATION GENETICS**

Day & Date: Saturday, 18-11-2017

Time: 10.30 AM to 1.00 PM

Seat

No.

Instructions: 1) All questions of Section-I are compulsory.

- 2) Answer any four questions from Section-II.
- 3) All questions carry equal marks.
- 4) Use of non-data storage calculator is allowed.

Section-I

Rewrite the following sentences by using correct alternatives: Q.1 A)

- 1) A subset of the population selected to help make inferences on a population is called
 - a) A population b) Inferential statistics c) A census d) A sample
- 2) An instructor recorded the following guiz scores (out of a possible 10 points) for the 12 students present: 7, 4, 4, 7, 2, 9, 10, 6, 7, 3, 8, 5. The mode for this set of scores is _____ a) 9.5 b) 7
 - c) 6
- 3) A process by which we estimate the value of dependent variable on the basis of one or more independent variables is called:
 - a) Correlation b) Regression d) Slope
 - c) Residual
- 4) Any hypothesis which is tested for the purpose of rejection under the assumption that it is true is called:
- c) Statistical hypothesis d) Composite hypothesis 5) ____ can cause deviation from the Hardy-Weinberg
- equilibrium. a) Small population

 - c) No selection

a) Null hypothesis

- Location of quantitative genes on chromosomes is called as a) Qualitative trait loci
 - c) Quantitative trait loci
- b) Genome mapping d) Chromosome map

b) Alternative hypothesis

- 7) In the new species evolve from continuous populations, rather than completely separate ones.
 - a) Parapatric speciation
- b) Peripatric speciation d) Quantum speciation
- c) Sympatric speciation

- b) Random mating d) No mutation





Set

Max. Marks: 70

07

07

14

14

- B) Answer the following terms.
 - a) Z-test.
 - b) Independent events.
 - c) Variable.
 - d) Habitat.
 - e) Population genetics.
 - f) Kin selection.
 - g) Co-adapted genes.

Section - II

Q.2 Write an essay on different theories of evolution. 14 Q.3 14 Write an essay on speciation. Q.4 Find the correlation coefficient between age and glucose level from the 14 following data. Age (Yrs) 43 21 25 42 57 69 Glucose level (mg/dL) 99 79 75 65 87 81

Interpret the correlationship between them.

Q.5 Answer any *TWO* of the following:

- a) Single marker analysis and interval mapping.
- b) The following table shows the numbers of hours spent by a child on different events on a working day.

Activity	School	Sleep	Playing	Study	T.V	Other
No. of hours	6	8	2	4	1	3
D						

Represent the above data by pie-chart.

c) Explain in detail about genetic polymorphism.

Q.6 Answer any two of the following:

- a) Write a note on standard deviation. Enlist the merits and demerits of using it.
- **b)** Associative mapping and Genomic selection.
- c) Calculate the arithmetic mean of the following data.

No. of fruits	1	2	3	4	5	7
Number of Plants	2	1	4	4	3	4

		М.S	Sc. (Semester - I) (CBCS) Examin Genetics	ation Oct/Nov-20)17
			CYTOGENETIC	AND GENOME (ORGANIZATION	
Day a Time	& Date : 10.3	e: Tue 0 AM	esday, 21-11-2017 to 1.00 PM			Max. Marks: 70
Instr	uctio	ns: 1) 2 3 4	All questions of Se Answer any four q All questions carry Draw neat and lab	ction-I are compulso uestions from Sectio equal marks. eled diagrams where	ry. n-II. ever necessary.	
				Section – I		
Q.1	A)	Rev 1) _	vrite the following s is sex a) Colorblindness	sentences by using chromosomal disord b)	ecorrect alternative der. Thalassemia	s: 07
		2) T	Furner syndrome is an	a d) b) d)	XX XYY	
		3) S	SINE requires a) Alu gene c) P-element	nearby to tra b) d)	nspose in a genome LINES Satellite DNA	
		4) _ a	a) Metacentric c) Telocentric	omosomes appear ro b) d)	od-shaped during an Acrocentric Sub-metacentric	aphase.
		5) S	Sex determination in a) XX-XY type c) ZZ-ZW type	birds isb) d)	 XX-XX type XO-XX type	
		6) T	The end of chromoso a) Telomere c) Chromonemata	ome are called as b) d)	Chromosome Centromere	
		7) _ a	virus I a) SV 40 c) Adenovirus	nas eight segments o b) d)	of RNA as genome. Influenza HIV	
	B)	Defi a) 1 b) 5 c) 1 d) 1 e) 0 f) 1 g) 0	ne the following te Minisatellite. Somaclonal variation Nuclesome. Reverse transcriptas Chromosome. Heterochromatin. Genomics.	erms.		07

Seat No.

Page **1** of **2**

Set P

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Section - II

Q.2	Answer any four: Describe chromosome banding with a labeled diagram.	14
Q.3	Describe extra nuclear inheritance with suitable examples.	14
Q.4	Explain Mechanisms of sex determination in animals.	14
Q.5	 Answer any two of the following: a) Write a note on – Meiotic Chromosomes. b) Explain dosage compensation. c) Write on – Microsatellite DNA. 	14
Q.6	 Answer any two of the following: a) Write a note on - Chromosome painting. b) Write on - Alu family. c) Explain fine structure of gene. 	14

Seat	
No.	

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017 Genetics CELLULAR AND MOLECULAR BIOLOGY

Day & Date: Thursday, 23-11-2017

Time: 10.30 AM to 1.00 PM

2)

Instructions: 1) Section-I is compulsory.

- 2) From Section-II attempt any four.
- 3) Figures to right indicate full marks.
- 4) Draw neat and labeled diagrams.

Section-I

Rewrite the following sentences by using correct alternatives: Q.1 A)

- 1) The initiation of DNA synthesis in prokaryotes commences through use of small RNA molecules which are synthesized by .
 - a) RNA polymerase c) DNA polymerase
- b) Primase d) Ligase
- _____ are the group of glycoprotenis that mediate Ca++ dependent cell cell adhesion.
- a) Selectin
- c) Intergrin
- RNA dependent DNA polymerase are also known as_
 - a) RNA Polymerase c) Topoisomerase
- b) Reverse transcriptase d) DNA polymerase

b) Cadherin

d) Immunoglobulins

- Clover leaf model belongs to _____ a) tRNA b) snRNA c) rRNA d) mRNA
- 5) The ______ surrounds the cell like belt, preventing the passage of substances between the cells
 - a) Gap junction
 - c) Hemi desmosome

Fluid mosaic model of cell membrane was put forward by_____ a) Daniel & Davson

- b) Singer & Nicolson
 - d) Watson & Crick

b) Desmosome

d) Tight junction

7) The genetic code translates the language of

a) RNA into DNA

c) RNA into proteins

Answer the following terms.

c) Garner & Allard

- b) DNA into RNA
- d) DNA into proteins.

07

c) Codon usage.

b) SSBPs.

B)

d) Gap junction.

a) Antisense RNA.

- e) Transcripition.
- f) Diffusion.
- g) M phase in cell cycle.

07

Max. Marks: 70

Set

Section-II

Q.2	Attempt any four: Write an essay on DNA replication in prokaryotes.	14
Q.3	Describe in detail WNT signaling pathway.	14
Q.4	Explain chemical composition of plasma membrane. Add a note on fluid mosaic model.	14
Q.5	 Answer any two of the following: a) Describe the structure and function of endoplasmic reticulum. b) Explain initiation of translation in prokaryotes. c) Explain properties of genetic code. 	14
Q.6	 Answer any two of the following: a) Vesicular transport of protein from ER to Golgi. b) Transcription. c) Cell cycle phases. 	14

Seat	
No.	

M.Sc. (Semester - I) (CBCS) Examination Oct/Nov-2017 Genetics **CLINICAL BIOINFORMATICS**

Day & Date: Thursday, 23-11-2017

Time: 10.30 AM to 1.00 PM

Instructions: 1) Part – I, Questions 1 is compulsory.

- 2) Attempt any four questions from part -II.
- 3) Figures to the right indicate full marks.

4) Answer to the Part-I and Part-II are to be written in same answer Booklet only.

Section-I

Rewrite the following sentences by using correct alternatives: Q.1 A)

- _____ also known as drug safety is the pharmacological science 1) relating to the collection, detection, assessment, monitoring, and prevention of adverse effects with pharmaceutical products. a) Clinical trial b) Pharmacovigilance
 - c) CDM d) Pharmacology
- is an affordable mapping and spatial analysis tool that allows you to easily produce publication-quality thematic maps.
 - b) MapViewer a) Microarray c) Ensemble
 - d) GEO
- CPT is a registered trademark of the _ Medical Association.
 - a) American b) Indian c) Australian
 - d) All of above
- 4) _ resource provides viral and viroid genome sequence data and related information.
 - a) ViPR b) Ensembl
 - c) dpSNP d) OMIM
- ____ can be used to filter, reformat, or trim your genomic and 5) _ metagenomic sequence data.
 - b) QPLOT a) HTQC c) PRINSEQ d) FASTX
- 6) R is an _____ language; users typically access it through a command-line interpreter.
 - a) Object oriented b) Structure oriented
 - c) Interpreted d) All
- is the total number of metabolites present within an 7) organism, cell or tissue.
 - a) Proteome c) Genome

- b) Metabolome
- d) Pharmacogenomics

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Max. Marks: 70

07

B) Answer the following terms.

- a) R scripting.b) Comparative genomics.c) Metabolome.
- d) Pharmacoviglance.
- e) Parasitic diseases.
- f) Genome Mapping.
- ý) NGS.

Section-II

Q.2	Attempt any four: Define clinical trial. Add a note on different stages.	14
Q.3	Write in detail various methods of NGS.	14
Q.4	Explain different types of host pathogen interactions.	14
Q.5	 Answer any two of the following: a) Add a note on Ensemble and Mapviewer. b) Write a note Medical coding. c) Explain the Human Genome Project. 	14
Q.6	 Answer any two of the following: a) Pharmacogenomics. b) Applications of metabolomics. c) Systems biology. 	14

Seat No.		Set	Ρ
	M.S	Sc. (Semester - III) (New) (CBCS) Examination Oct/Nov-2017 Genetics	
		IMMUNOLOGY & IMMUNOTECHNOLOGY	
Day & Time:	Date 02.30	:: Thursday, 16-11-2017 Max. Marks:) PM to 05.00 PM	70
Instru	ction	s: 1) Section-I compulsory.2) Attempt any four from Section-II.	
		Section – I	
Q.1	A)	 Choose the correct alternative and rewrite the sentences. 1) MHC genes in human are present on chromosome. a) 7 b) 14 c) 6 d) 12 	07
		 2) Phycoerythrin is used in test a) Radioimmunoassay b) Immune-fluorescence c) ELISA d) Complement fixation 	
		 3) Active immunization is done by using a) Vaccines b) Hyper immune sera c) Immune sera d) Convelescent 	
		 4) antibody in called as secretary antibody. a) IgG b) IgM c) IgA d) IgE 	
		 5) is primary lymphoid organ. a) Spleen b) Lymphnode c) Peyer's patch d) Thymus 	
		 6) The incomplete antigen is called as a) Epitope b) Adjuvant c) Hapten d) Antibody 	
		7) The first step in the classical complement activation pathway is	
		 a) Binding of C1 to antigen-antibody b) Binding of C3b to an activator c) Binding of C2 to an activator d) Binding of antigen of C1 	
	В)	 Define the following terms. a) Define acute and hyper acute graft rejection b) Properties of cytokines c) Enlist factors affecting innate immunity d) ELISA e) Difference atopy f) Give any two organ non-specific autoimmune diseases g) Function of B cells 	07

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SLR-MK-431

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Section – II Answer any four of the following

Q.2	Give structural, morphological, cultural, life cycle and pathogen city characters, Lab diagnosis, Prophylaxis of HIV virus.	14
Q.3	Explain mechanism of processing and presentation of endogenous antigen.	14
Q.4	B cell activation, proliferation and differentiation.	14
Q.5	 Answer any two from the following. a) Explain structure of MHC class II molecule. b) Explain factors affecting antigen city and types of antigens. c) Mechanism of allograft recognition. 	14
Q.6	 Answer any two from the following. a) New trend vaccines b) Classical complement pathway c) Write an essay on principle of antigen and antibody interaction 	14

M.Sc. (Semester - III) (New) (CBCS) Examination Oct/Nov-2017 Genetics GENETIC ENGINERRING

Day & Date: Saturday, 18-11-2017 Time: 02.30 PM to 05.00 PM

Instructions: 1) Section-I compulsory.

- 2) Attempt any four from Section-II.
- 3) Draw neat and labeled diagrams.

Section-I Rewrite the sentence after choosing the correct answer from the

given alternatives. 1) Which of the following DNA polymerase don't have 5' to 3' exonuclease activity? a) Klenow b) Kornberg c) Klenew d) Korenberg is the technique used for characterizing large region of 2) chromosome. a) RAPD b) Chromosome walking c) PCR d) RFLP 3) In Maxam's Gilbert's method guanine is methylated by a) Dumethyl Sulphonate b) Dinethy Succinate c) Dimethyl Sulphate d) Dimethyl Acetate 4) Blue – white selection method is an example of _____ type of screening method. a) Direct b) Immunological c) Hybridization d) Indirect 5) _____ is a source of Ribonuclease A. a) Bovine pancreas b) Aspergillus niger d) Pseudomonas Putida c) Horse pancreas 6) Colony hybridization technique has been developed by a) Murashigue & Skoog b) M. Grustein & D. S. Hogness c) Mertz & Davis d) Hugh & Birnstil vector is used in both prokaryotes & eckaryotes. a) M 13 b) Cosmid c) Shuttle d) Phagemid B) **Definitions.** 07 a) Genomic library **b)** Microinjection c) Endonucleases d) Donar DNA e) Exonucleases f) Cosmid g) Plasmid

Max. Marks: 70

07

Seat No.

Q.1

A)

Section – II

Q.2	Explain chain termination method of DNA sequencing.	14
Q.3	Explain in detail RFLP & add a note on its applications.	14
Q.4	Explain with example plasmid as a cloning vector.	14
Q.5	 Answer any two from the following. a) Explain how will you produce salt tolerant plant. b) Describe direct DNA transfer method by using syringe & needle. c) Explain direct screening method for recombinants. 	14
Q.6	 Write short notes on. (Any two) a) Explain the methods of labeling of probes. b) Write a note on synthesis of human interferon. c) Explain production of Hepatitis B recombinant vaccine. 	14

nmaglobulinemia	d)	Marfan syndrome		
is defined as compounded that desired biological				
on molecular target.				
1	b)	Genome		
cury	d)	Iron		

Seat No. M.Sc. (Semester - III) (New) (CBCS) Examination Oct/Nov-2017

SLR-MK-433

Max. Marks: 70

Day & Date: Tuesday, 21-11-2017 Time: 02.30 PM to 05.00 PM

Instructions: 1) All question of Section-I are compulsory.

2) Answer any Four questions from Section-II.

3) All questions carry equal marks.

4) Draw neat and labeled diagrams wherever necessary.

Section-I

Genetics MOLECUALR MEDICINE

Q.1 A) Rewrite the sentence after choosing the correct answer from the 07 given alternatives. 1) ____gene is mutated in cystic fibrosis. a) CFTR b) Actin c) Cadherin d) Fibrin 2) Nerve tangles in alzheimer's disease is caused due to protein. a) Ameloid beta b) Tau protein d) Delta c) Sigma 3) Stem cell exhibits _____ properties. a) Only potency b) Potency and self renewable c) Potency and non renewable d) Only self-renewable 4) The α -globin gene of haemoglobin is located on chromosome number_____. a) 11 b) 12 d) 18 c) 16 5) MHC Antigen is human is known as_ b) ALC a) ASB c) HLA d) HSB 6) Mutation in BTK gene leads to condition known as a) Phenylketonuria b) Haemoglobinopathies c) Agan 7) ___ activity of a) Lead c) Merc

Set

B) Definitions.

- a) DNA fingerprinting.
- b) Pharmacogenetics.c) Stem cells.
- d) Positional cloning.
- e) Lead optimization.
- f) In-vivo gene therapy.
- g) Microarray.

Section-II

Answer any of the following.

Q.2	Explain in detail steps involved in drug discovery and its design.	14
Q.3	Write a note on different types of gene therapies.	14
Q.4	Explain in detail process of gene transfer by viruses and other methods.	14
Q.5	 Answer any <i>TWO</i> from the following. a) Give an account on phenyketonuria. b) Describe the difference between adult and embryonic stem cells. c) Explain in detail prenatal diagnosis and its methods. 	14
Q.6	 Write short notes on any <i>TWO</i> of the following. a) Describe disease related to permanent memory loss. b) Describe in detail route of administration of drugs. 	14

c) Write a note on Parkinson's disease.