

M.Sc. Sem.-3 Examination

503 (EA)

Human Genetics

November-2025

Time : 2-30 Hours]

[Max. Marks : 70

Q-I	1	Write a descriptive account on FISH technique.	(14)
	2	Write a note on trisomy disorders observed in humans.	
	OR		
	1	Explain the role of chromosomes in the evolution of primates.	
	2	Give the application of ultrasound and maternal blood screening in prenatal diagnosis.	
Q-II	1	Write a note on SOS repair mechanism.	(14)
	2	Write a descriptive account of Human Genome Project.	
	OR		
	1	What is the role of DNA modification & restriction in prokaryotes? Discuss.	
	2	What is the technique of subtractive hybridization? Discuss its use in gene isolation.	
Q-III	1	Describe the steps involved in the execution of EMT.	(14)
	2	Write a note on Embryonic proteins as tumour markers.	
	OR		
	1	Write a note on angiogenesis and cancer.	
	2	Enlist the properties of tumour markers.	
Q-IV	1	Describe the principle, procedure (flow chart), applications, advantages, and disadvantages of the Ames Test.	(14)
	2	What are the different methods by which drugs can be administered to the body? Give examples.	
	OR		
	1	Describe the concept and types of dose-response relationships in toxicology.	
	2	Write an account of the various factors pertaining to the organism that influence the toxicity of a substance.	
Q-V	Answer any SEVEN out of TWELVE.		(14)
	1	What is the application of cord blood sampling?	02
	2	Give karyotype of Turner syndrome.	02
	3	What is the advantage of G Banding?	02
	4	Give examples of gene families.	02
	5	Give reasons why rRNA genes were the first to be isolated.	02
	6	What is the limitation of recombination repair mechanism?	02
	7	What are prognostic cancer markers? Give two examples.	02
	8	Briefly explain the use of PET in the diagnosis of cancer.	02
	9	Briefly explain any one protein involved in the regulation of cell cycle during the development of cancer.	02
	10	List the factors of the surrounding medium that affect the toxicity of a substance.	02
	11	Write the names of four commonly used in vitro antioxidant evaluation tests.	02
12	What do you mean by IC_{50} and EC_{50} ? Define both terms.	02	

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Candidate's Seat No : _____

M.Sc. Sem.-3 Examination

503 (EC)

Human Genetics

November-2025

[Max. Marks : 70]

Time : 2-30 Hours]

Q-I	1	Explain the indications & purpose of genetic counseling.	(14)
	2	Discuss: the goals & components of genetic counseling.	
	OR		
	1	Write a detailed note on construction of pedigree.	
	2	Explain: the value of extended negative history & red flags in a family history suggestive of genetic condition.	
Q-II	1	Write a note on case preparation & management.	(14)
	2	What are the core qualities important in genetic counseling session? Explain.	
	OR		
	1	Write a note on psychotherapeutic counseling.	
	2	What are the different interviewing techniques? Discuss.	
Q-III	1	Illustrate the rules of addition and multiplication with relevant genetic examples.	(14)
	2	Explain the different components of probability with examples.	
	OR		
	1	Explain pathway-based genetic counseling for multiple genetic changes.	
	2	Write a short note on genetic diagnosis of single-gene disorders with an example.	
Q-IV	1	Describe the principle, procedure (flow chart), applications, advantages, and disadvantages of the Ames Test.	(14)
	2	What are the different methods by which drugs can be administered to the body? Give examples.	
	OR		
	1	Describe the concept and types of dose-response relationships in toxicology.	
	2	Write an account of the various factors pertaining to the organism that influence the toxicity of a substance.	
Q-V	Answer any SEVEN out of TWELVE.		(14)
	1	What is autonomy in a genetic counseling session?	02
	2	Draw a pedigree which cannot be X-linked recessive.	02
	3	Differentiate between empathy & sympathy.	02
	4	What is the importance of silence?	02
	5	Define counter transference.	02
	6	What is projective identification?	02
	7	What is Bayes' Theorem and how is it useful in genetics?	02
	8	Give the full form of "MLPA" and mention its role.	02
	9	Name two drugs used to treat cystic fibrosis.	02
	10	List the factors of the surrounding medium that affect the toxicity of a substance.	02
	11	Write the names of four commonly used in vitro antioxidant evaluation tests.	02
	12	What do you mean by IC ₅₀ and EC ₅₀ ? Define both terms.	02

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Candidate's Seat No : _____

M.Sc. Sem.-3 Examination

503 (ED)

Human Genetics

November-2025

Time : 2-30 Hours]

[Max. Marks : 70

Q-I	1	Explain the composition and fundamental roles of the Institutional Animal Committee (IAC) as mandated by CPCSEA.	(14)
	2	Explain the caging facility and physiological factors for different lab animals according to CPCSEA guideline.	
	OR		
	1	Discuss the design and construction principles for the animal house according to CPCSEA guidelines.	
	2	Explain in detail: IACUC guideline, including scope and committee structure, key responsibilities, documentation, and animal care standards for animal housing facilities.	
Q-II	1	Explain the core cellular and molecular mechanisms of hepatotoxicity. Describe the key events and how they lead to hepatocyte injury.	(14)
	2	Describe the health consequences of long-term exposure to endocrine-disrupting chemicals (EDCs) in humans.	
	OR		
	1	List the main routes by which hazardous agents enter the human respiratory system and identify the primary target organs or tissues affected by each route.	
	2	Explain in detail: Toxic response to skin.	
Q-III	1	Discuss the key parameters that influence the degree of radiotoxicity in living systems.	(14)
	2	Describe the various types of food additives and their functions.	
	OR		
	1	Give a comprehensive note on teratogens and their effects, with suitable examples.	
	2	Write an account of the classification of toxicants with suitable examples.	
Q-IV	1	Explain the principle of the Ames test used for detecting mutagenic chemicals and include its method (flow chart), applications, merits and demerits.	(14)
	2	Describe the various routes of administration of drugs, giving their advantages and disadvantages.	
	OR		
	1	Explain how the dose-response relationship is evaluated and mention its significance.	
	2	What are the major factors relating to the organisms that influence the toxic action of chemicals? Explain with examples.	
Q-V	Answer any SEVEN out of TWELVE.		(14)
	1	What are the signs of heatstroke in dogs?	02
	2	Compare the CPCSEA and IACUC guidelines. (any two)	02
	3	Define photoperiod.	02
	4	What is the meaning of genotoxic?	02
	5	Give the full name of DLCO.	02
	6	Define: Presumed Toxicity	02
	7	Expand the abbreviations NOAEL and DNEL as used in risk assessment studies.	02
	8	Differentiate between food contamination and food adulteration.	02
	9	List four examples of plant-derived pesticides.	02
	10	Write the names of environmental (surrounding medium) factors that influence toxicity.	02
	11	Give the names of four in vitro methods used for testing free radical scavenging activity.	02
12	Explain the meaning of IC ₅₀ and EC ₅₀ in toxicological evaluations.	02	

