2211E785

Candidate's Seat No :_____

M.Sc Sem-3 Examination

503

Human Genetics (EA)

November-2024

Time : 2-30 Hours] **[Max. Marks : 70**

Q-I	**1**	Discuss the techniques used in non-invasive prenatal testing.	**(14)**
	2	Write a note on FISH technique and its applications.	
		OR	
	1	Discuss the role of chromosomes in human evolution.	
	2	What are the aneuploidy syndromes in humans? Explain with examples.	
Q-II	**1**	Write a note on the DNA modification and restriction in prokaryotes.	**(14)**
	2	Explain the SOS and direct repair mechanism.	
		OR	
	1	What is subtractive hybridization? Explain use of this technique in gene isolation.	
	2	Write a detailed note on the Human Genome Project.	
Q-III	**1**	Write a note on "Epithelial-mesenchymal transition and cancer".	**(14)**
	2	Describe hormones as a tumor-specific marker.	
		OR	
	1	Explain the execution of angiogenesis during the metastasis of cancer.	
	2	Explain the role of telomeres and telomerase in the development of cancer.	
Q-IV	**1**	List the factors influencing toxicity and include comprehensive information on each one.	**(14)**
	2	Write the principle, method, applications, advantages, and limitations of the Ames test.	
		OR	
	1	Explain free radical toxicity in brief.	
	2	Enumerate the various routes of administration that are helpful to evaluate the toxicity of the test substances and explain them in detail.	
Q-V		**Answer any SEVEN out of TWELVE.**	**(14)**
	1	Give two examples of chromosome abnormalities related to cancer.	**02**
	2	Write a karyotype for a female with inversion of heterochromatin region of chromosome 9.	**02**
	3	What is the application of array CGH?	**02**
	4	What is the role of DNA methylation in eukaryotes?	**02**
	5	Give two examples of disorders in humans caused due to defective DNA repair.	**02**
	6	What is the international HapMap project?	**02**
	7	What are cancer antigens? Give examples and respective cancer types.	**02**
	8	Why is the PET technique used during the diagnosis of cancer?	**02**
	9	Explain PSA as a cancer diagnostic agent.	**02**
	10	Write the advantages and disadvantages of the trypan blue dye exclusion test.	**02**
	11	Give a diagrammatic representation of the differences between apoptosis and necrosis.	**02**
	12	Define LD50 and LC50.	**02**

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2211E785-2 Candidate's Seat No :_____

M.Sc Sem-3 Examination

503

Human Genetics (EB)

Time : 2-30 Hours] **November-2024** **[Max. Marks : 70**

Q-I	**1**	Explain briefly: Hydrophobic receptors	**(14)**
	2	Discuss hormonal activation of adenylyl cyclase.	
		OR	
	1	Give a brief note on the mechanism of autophosphorylation.	
	2	Write a short note on neurotransmitter signaling with an example.	
Q-II	**1**	Explain the role of aldosterone in regulating blood pressure [renin-angiotensin-aldosterone system (RAAS)] in brief.	**(14)**
	2	Write a detailed note on any two glands of human endocrine system.	
		OR	
	1	Write a detailed note on any two disorders of the respective endocrine glands.	
	2	Describe types of hormones on the basis of the distance between the site of production and the site of action.	
Q-III	**1**	Explain glucose stimulated insulin secretion.	**(14)**
	2	Briefly explain the role of Calciferol as a hormone.	
		OR	
	1	Describe the external factors affecting pancreatic hormone secretion.	
	2	Give a brief description of hormonal control of lipid metabolism.	
Q-IV	**1**	Write the trypan blue dye exclusion assay's principle, method, advantages, and disadvantages, along with the labeled diagram.	**(14)**
	2	Explain free radical toxicity in brief.	
		OR	
	1	Write the principle, method, applications, advantages, and limitations of the Ames test.	
	2	Describe in detail: The various routes of administration to assess the toxicity of specific test substances.	
Q-V		**Answer any SEVEN out of TWELVE.**	**(14)**
	1	What is the full form of "PKC"? Mention its role.	**02**
	2	State the contribution of "Claude Bernard".	**02**
	3	Add a note on "kinases".	**02**
	4	Define mixed gland with an example.	**02**
	5	Enlist the four feel-good hormones.	**02**
	6	Define insulin and glucagon.	**02**
	7	What are the effects of insulin in muscles?	**02**
	8	What are the functions of glucagon in the liver?	**02**
	9	Name any 8 (eight) glucoregulatory hormones.	**02**
	10	Write the general phase I oxidative biotransformation formula which uses CYP450.	**02**
	11	Give four examples of endogenous xenobiotics.	**02**
	12	Define dose and threshold dose.	**02**

2211E785-3

Candidate's Seat No :_____

M.Sc Sem-3 Examination

503

Human Genetics (EC)

November-2024

Time : 2-30 Hours] **[Max. Marks : 70**

Q-I	**1**	Explain the philosophy and ethos of genetic counseling.	**(14)**
	2	What are the Practice based competencies for genetic counselors? Discuss.	
		OR	
	1	Describe the method for construction of pedigrees & establishing carriers.	
	2	What are the indications and purpose of genetic counseling?	
Q-II	**1**	What are the disruptions in a working alliance? Discuss all possible reasons.	**(14)**
	2	Explain the different interviewing techniques giving examples.	
		OR	
	1	What are the reactions and psychologically challenging experiences? Explain all points.	
	2	What are the core qualities required for a successful genetic counseling session? Discuss.	
Q-III	**1**	Pathway-based counseling in monogenic disease.	**(14)**
	2	Discuss genetic diagnosis for metabolic disorders by an example.	
		OR	
	1	What is molecular pathology? Explain with an example.	
	2	Write a short note on Bayes' theorem application in risk assessment.	
Q-IV	**1**	Write the trypan blue dye exclusion assay's principle, method, advantages, and disadvantages, along with the labeled diagram.	**(14)**
	2	Explain free radical toxicity in brief.	
		OR	
	1	Write the principle, method, applications, advantages, and limitations of the Ames test.	
	2	Describe in detail: The various routes of administration to assess the toxicity of specific test substances.	

Q-V		**Answer any SEVEN out of TWELVE.**	**(14)**
	1	What is the significance of extended negative history in a pedigree?	**02**
	2	How can variable expressivity affect interpretation of family history?	**02**
	3	What is an empathic break?	**02**
	4	Give examples of non verbal communication.	**02**
	5	Define: Working agreement in context of genetic counseling.	**02**
	6	Give two recommendations for medical documentation.	**02**
	7	Mention the purpose of a gene expression profile.	**02**
	8	Add a note on MLPA technique.	**02**
	9	What is "Gene Pool"?	**02**
	10	Write the general phase I oxidative biotransformation formula which uses CYP450.	**02**
	11	Give four examples of endogenous xenobiotics.	**02**
	12	Define dose and threshold dose.	**02**