

## M.Sc Sem-3 Examination

504

Zoology (EA)

Time : 2-30 Hours]

November-2024

[Max. Marks : 70]

<b>Q-I</b>	1	Explain briefly: Estrogen mechanisms of action	<b>(14)</b>
	2	Discuss signal transduction for Nitric Oxide signals.	
	<b>OR</b>		
<b>Q-II</b>	1	Give a note on mechanisms of "Receptor Protein-Tyrosine Kinases" .	<b>(14)</b>
	2	Write a short note on NF- $\kappa$ B Signaling briefly.	
	<b>OR</b>		
<b>Q-III</b>	1	Explain briefly: applications of Liposome.	<b>(14)</b>
	2	Write any one tool or technique used in nanoparticle characterization.	
	<b>OR</b>		
<b>Q-IV</b>	1	Give an account on types of nanopore and its application.	<b>(14)</b>
	2	Discuss "green synthesis of AgNPs".	
	<b>OR</b>		
<b>Q-V</b>	1	Write a note: SELEX and Microfluidics stem cell isolation techniques	<b>(14)</b>
	2	What is regenerative medicine? Write down any three types of stem cell therapy used for treatment of diabetes.	
	<b>OR</b>		
<b>Q-IV</b>	1	Write down the principle, application, advantages, and disadvantages of Magnetic activated cell sorting and Fluorescence-activated Cell Sorting techniques.	<b>(14)</b>
	2	Explain in detail: Application of stem cell therapy for skin diseases.	
	<b>OR</b>		
<b>Q-V</b>	1	Give a detailed description of the DNA vaccine's mechanism along with a labeled diagram.	<b>(14)</b>
	2	Explain the gene therapy approach that involves targeted inhibition of gene expression.	
	<b>OR</b>		
<b>Q-V</b>	1	Draw a labeled diagram of flow cytometry and explain it in detail.	<b>(14)</b>
	2	Make a list of PCR variants and explain their principles.	
	<b>Answer any SEVEN out of TWELVE.</b>		
<b>Q-V</b>	1	Give the full form of "PIP3" and mention its role.	<b>02</b>
	2	What is the role of calmodulin?	<b>02</b>
	3	Define: Signal Amplification	<b>02</b>
	4	What is "GridION"?	<b>02</b>
	5	Define: controlled drug delivery systems.	<b>02</b>
	6	Add a note on "LFIA".	<b>02</b>
	7	Write down the advantages and limitations of density gradient cell separation.	<b>02</b>
	8	What are the Yamanaka factors and its role in stem cells?	<b>02</b>
	9	What is Hyperbaric Oxygen Therapy?	<b>02</b>
	10	The full form of 'SOLiD' is _____ and it was developed by _____ company for DNA sequencing.	<b>02</b>
	11	Needle-free ZyCoV-D, manufactured by _____ company and it is the first Covid-19 vaccine approved for the _____ years age group in India.	<b>02</b>
	12	Make a labeled diagram that explains the types of gene transfer approaches used in gene therapy.	<b>02</b>

(P.T.O)

<b>Q-I</b>	1	Describe in detail Non-genetic factors affecting sex determination.	<b>(14)</b>	
	2	Write a note on Non-Invasive Prenatal diagnosis, stating the advantages.		
	<b>OR</b>			
	1	Explain the sequence of events in the development of the testis in the embryo.		
<b>Q-II</b>	2	Discuss the genes that play a role in the control of sex determination.		
	1	Explain external parts and mammary gland of female reproductive system in brief	<b>(14)</b>	
	2	Write a detailed note on any two diseases of egg cell.		
	<b>OR</b>			
<b>Q-III</b>	1	Write a detailed note on menstrual cycle	<b>(14)</b>	
	2	Write a detailed note on barrier methods of birth control		
	1	Describe the ultrastructure of sperm head and acrosome.		
	2	Explain the process of Spermatogenesis.		
<b>Q-IV</b>	<b>OR</b>			
	1	Discuss the ultrastructure and functions of the Sertoli cell.		
	2	State the role of semen. Explain the fractions of ejaculation and any 2 components.		
	1	Write a detailed account on: Competitive ELISA	<b>(14)</b>	
<b>Q-V</b>	2	What is a micromanipulator? Add a note on: MART.		
	<b>OR</b>			
	1	Describe the technique of Electrochemiluminescence.		
	2	Discuss the surgical methods used for male contraception.		
<b>Answer any SEVEN out of TWELVE.</b>			<b>(14)</b>	
1 Briefly explain: Chorionic Villus sampling			<b>02</b>	
2 Name 2 Scientists and mention their contributions related to this subject.			<b>02</b>	
3 Briefly explain any 2 abnormalities related to incomplete sex differentiation.			<b>02</b>	
4 Enlist any two functions of egg cell.			<b>02</b>	
5 Define intrauterine devices.			<b>02</b>	
6 Define primordial follicle.			<b>02</b>	
7 State 2 characteristics and the main function of the Leydig cell.			<b>02</b>	
8 List the main steps in an IVF Program.			<b>02</b>	
9 Write the reaction and limitation of IRMA.			<b>02</b>	
10 Briefly explain: Comet Assay			<b>02</b>	
11 Distinguish between: PGD and PGS.			<b>02</b>	
12 Briefly explain: Hormonal contraception in the female.			<b>02</b>	

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Zoology (EC)

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Q-I	1	Describe the wildlife crime scene.	(14)	
	2	Write a note on Wildlife poaching in India.		
	<b>OR</b>			
	1	Explain the collection of evidence at the wildlife poaching site.		
Q-II	2	Write a note on the Wildlife crime scene documentation.		
	1	What role does arthropoda play in forensic evidence?	(14)	
	2	Mention the developmental stages of an insect with an example.		
	<b>OR</b>			
Q-III	1	Explain "types of sampling methods" in brief.	(14)	
	2	Describe "molecular technique used in forensic entomology".		
	1	Write a note on "Structure of hair".		
	2	Write a note on Reptile scale identification in major reptile groups.		
Q-IV	<b>OR</b>			
	1	Explain any one technique used in the studying of hair for forensic application.	(14)	
	2	Write a note on "Value of international trade in reptile skins and skin products".		
	1	Explain the isolation of DNA using silica membrane.		
Q-V	2	Write a note on RT-PCR.	(14)	
	<b>OR</b>			
	1	Write a note on RFLP.		
	2	Describe the clean room arrangement for the isolation of DNA and PCR setup for forensic analysis.		
<b>Answer any SEVEN out of TWELVE.</b>			(14)	
Q-V	1	Briefly explain the most often cases of human-wildlife conflict at Gir sanctuary.	02	
	2	Explain the leopard as a main mammal responsible for human-wildlife conflict in Mumbai.	02	
	3	How are animal burial sites located?	02	
	4	Explain "abundance".	02	
	5	Define: entomotoxicology	02	
	6	How do clothes moths contribute to corpse decomposition?	02	
	7	What is hair pigmentation? Name any two pigments that impart color to hairs.	02	
	8	Name any two forms of hair medulla and species in which these forms are present.	02	
	9	State any four reasons for difficulty in the identification of reptilian skin products.	02	
	10	Why are mitochondrial DNA-encoded genes considered best for the determination of species in forensic analysis?	02	
	11	Give full form and application of AFLP.	02	
	12	What are chaotropic agents? Why are they used in DNA isolation?	02	

(P.T.O)

<b>Q-I</b>	<b>1</b>	Explain: Chorion villus and fetal blood sampling.	<b>(14)</b>
	<b>2</b>	Write a note on importance & applications of maternal blood screening and ultrasound in prenatal diagnosis.	
	<b>OR</b>		
	<b>1</b>	What is newborn screening? Discuss.	
	<b>2</b>	Discuss the criteria for invasive prenatal diagnosis. Also, mention the ELSI in invasive testing.	
	<b>OR</b>		
<b>Q-II</b>	<b>1</b>	Write on the New Genome Testing Techniques and their Interpretation.	<b>(14)</b>
	<b>2</b>	What is Pre-symptomatic testing? Explain.	
	<b>OR</b>		
<b>Q-III</b>	<b>1</b>	What are the detection methods for unknown mutations? Discuss.	<b>(14)</b>
	<b>2</b>	Explain in detail all the versions of PCR used for genetic diagnostics.	
	<b>OR</b>		
<b>Q-IV</b>	<b>1</b>	Write on the ethical, legal & social issues in gene therapy & clinical trials.	<b>(14)</b>
	<b>2</b>	What is the Impact of Genetic Disease on patients and families? Discuss.	
	<b>OR</b>		
	<b>1</b>	Write a descriptive note on Genetic Engineering and Ethics.	
	<b>2</b>	What is the significance of interaction with parents & families for a new counselor? Discuss giving your experience.	
	<b>OR</b>		
<b>Q-V</b>	<b>Answer any SEVEN out of TWELVE.</b>		
	<b>1</b>	How can neural tube defects be detected prenatally?	<b>02</b>
	<b>2</b>	How is true mosaicism and pseudo-mosaicism distinguished in cultures of invasive testing?	<b>02</b>
	<b>3</b>	When is PGD suggested?	<b>02</b>
	<b>4</b>	What is genetic discrimination?	<b>02</b>
	<b>5</b>	What are Genetic linkage maps?	<b>02</b>
	<b>6</b>	What are genetic markers?	<b>02</b>
	<b>7</b>	What is Paternity testing?	<b>02</b>
	<b>8</b>	What are the barriers to accessing genetic counseling and testing?	<b>02</b>
	<b>9</b>	What are hereditary cancers?	<b>02</b>
	<b>10</b>	What is informed consent?	<b>02</b>
	<b>11</b>	What is the status of Medical ethics in India?	<b>02</b>
	<b>12</b>	What are Direct-to-consumer genetic Tests?	<b>02</b>

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[Max. Marks : 70]

<b>Q-I</b>	<b>1</b>	Write an account on HPRT and Xprt assay.	<b>(14)</b>	
	<b>2</b>	Write a detailed note on SSGE assay and draw the labeled diagram.		
	<b>OR</b>			
	<b>1</b>	Describe the sister chromatid exchange analysis test in detail.		
<b>Q-II</b>	<b>2</b>	Provide information on the LDH assay.		
	<b>1</b>	AHR plays an important role in the field of ecotoxicology. Explain in detail.	<b>(14)</b>	
	<b>2</b>	Enlist and explain the diseases caused due exposure to contaminated soil.		
	<b>OR</b>			
<b>Q-III</b>	<b>1</b>	What is ecotoxicogenomics? Explain in detail.	<b>(14)</b>	
	<b>2</b>	Explain in detail about the principles of ecotoxicology.		
	<b>1</b>	Write a note: Arsenic toxicity and Cadmium toxicity.		
	<b>2</b>	What are Cyanotoxins? Write down different types, environmental factors, health risk, regulation and management of cyanotoxins.		
<b>Q-IV</b>	<b>1</b>	Explain in detail: Mercury toxicity and Chromium toxicity.	<b>(14)</b>	
	<b>2</b>	What is soil pollution? Write down the types of soil pollutants, sources, diseases, treatment and prevention caused due to soil pollutants.		
	<b>1</b>	What is Labeling? Explain its importance.		
	<b>2</b>	Explain briefly: Role of Central Drugs Standard Control Organization.		
<b>Q-V</b>	<b>OR</b>			
	<b>1</b>	Give a note on "Types of Guidelines".	<b>(14)</b>	
	<b>2</b>	Write a short note on toxicological evaluations of occupational agents.		
	<b>Answer any SEVEN out of TWELVE.</b>			
<b>Q-V</b>	<b>1</b>	Write the full form of GST and SOD.	<b>02</b>	
	<b>2</b>	The _____ quantifies genetic alterations affecting the expression of the thymidine kinase (Tk) gene which is located on chromosome _____ and part of the salvage pathway for pyrimidine nucleic acid breakdown product.	<b>02</b>	
	<b>3</b>	Write the advantages of MTT assay.	<b>02</b>	
	<b>4</b>	What is the common name of the disease Coccidioidomycosis? Which fungus is responsible for this disease?	<b>02</b>	
	<b>5</b>	Give 2 symptoms of tetanus infection.	<b>02</b>	
	<b>6</b>	Give the name and shape of the organism responsible for Botulism.	<b>02</b>	
	<b>7</b>	Give full name of PFAS and PCDF.	<b>02</b>	
	<b>8</b>	Define: Phytoremediation	<b>02</b>	
	<b>9</b>	Which are the methods used for identification of Hazards?	<b>02</b>	
	<b>10</b>	What is the Permissible Exposure Limit (PEL)?	<b>02</b>	
	<b>11</b>	Define: Service Standards.	<b>02</b>	
	<b>12</b>	Give the full form of "FFDCA" and mention its role.	<b>02</b>	