1711E1315

Candidate's Seat No :_____

M.Sc. Sem.-3 Examination

504

C. E. & A. R. T.

November-2025

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

Q1A	Explain the process and significance of Assisted Oocyte Activation (AOA). Discuss the various chemical, mechanical, and electrical activation methods used in ART.	7 Mark
Q1B	Describe the principle, procedure, and clinical applications of Polymerase Chain Reaction (PCR) and quantitative PCR (qPCR) in infertility diagnostics.	7 Mark
	OR	
Q1A	Explain how PCR-based techniques are applied in preimplantation genetic testing (PGT) and embryo screening.	7 Mark
Q1B	Compare and contrast Sanger Sequencing and Next Generation Sequencing (NGS) in terms of workflow, accuracy, and their use in detecting genetic causes of infertility.	7 Mark
Q2A	Explain reversible enzyme inhibition and its types in detail.	7 Mark
Q2B	Explain different Proteomic strategies in embryo development analysis.	7 Mark
	OR	
Q2A	Explain IUBMB classification of enzyme in detail.	7 Mark
Q2B	Write a short note on following techniques: (a) SDS-PAGE (b) Protein detection by MS	7 Mark
Q3A	Explain the workflow of LC-MS data analysis, including sample preparation, conversion, database matching, and automated metabolite identification.	7 Mark
Q3B	Explain the components of HPLC and its role in separating and quantifying biomolecules in clinical samples.	7 Mark
	OR	
Q3A	Discuss how LC–MS combines chromatography and mass spectrometry for sensitive detection and identification of biomolecules.	7 Mark
Q3B	Discuss the role of analytical techniques (HPLC, LC-MS, NMR) in evaluating embryo culture media, follicular fluid, and serum for reproductive analysis.	7 Mark
Q4A	Discuss the medical management of male infertility, emphasizing hormonal, pharmacological, and surgical interventions.	7 Mark
Q4B	Describe the evaluation, prevention, and management of Ovarian Hyperstimulation Syndrome (OHSS) in ART.	7 Mark
	OR	
Q4A	Describe the medical management of female infertility with reference to ovulation induction, hormonal therapy, and endometrial preparation.	7 Mark

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Q4B	Elaborate on the pharmacological approaches in ART, including the role of gonadotropins, clomiphene citrate, and GnRH analogs.	7 Mark

Q 5	**Answer the following questions (Any Seven)**	**14 Marks**
1.	What is the definition of essential and non-essential amino acids?	
2.	What is meant by "retention time" in HPLC?	
3.	What does Ct value indicate in qPCR analysis?	
4.	A low Km value indicates a _____ affinity between enzyme and substrate,where as a high Km value reflects a _____affinity between them.	
5.	What is the role of calcium ionophore in oocyte activation?	
6.	Define endogenous and exogenous metabolites with one example each.	
7.	Name any two drugs used for ovulation induction.	
8.	What is meant by mass-to-charge ratio (m/z) in mass spectrometry?	
9.	What happens to enzyme when temperature is below optimum temperature and above optimum temperature?	
10.	Define luteal phase support.	
11.	List two advantages of NMR spectroscopy.	
12.	Mention any two chemical agents used in Assisted Oocyte Activation.	
13.	State one biochemical marker used in ovarian reserve assessment.	
14.	Write a definition of holo-enzyme and metal activated enzyme.	