

Reg. No.:



Name:

University of Kerala

Y7605

Fourth Semester FYUGP Degree Examination, May 2026

Discipline Specific Elective

BIOTECHNOLOGY

UK4DSEBIT206 - Biophysics and Instrumentation

Academic Level: 200-299

2024 Admission

Time: 1 Hour 30 Minutes(90 Mins.)

Max. Marks: 42

Part A. 6 Marks.Time:6 Minutes.(Cognitive Level:Remember(RE)/Understand(UN)) Objective Type. 1 Mark
Each.Answer all questions

Qn No.	Question	CL	CO
1	Give two examples of exergonic reactions in biological system ?	RE	1
2	What is density gradient centrifugation?	RE	3
3	Explain the principle of IR spectroscopy?	UN	4
4	Explain the function of Troponin in muscle contraction.	UN	2
5	Describe the role of the cochlea in hearing?	UN	2
6	Discuss proton gradient in ATP synthesis	UN	1

Part B. 8 Marks.Time:24 Minutes.(Cognitive Level:Understand(UN)/Apply(AP))Short Answer. 2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	Explain the principle of electrophoresis.	UN	3
8	Outline the principle of pH meter.	UN	4
9	Illustrate how hearing aids help individuals with partial hearing loss.	AP	2
10	Illustrate the role of proton gradient in ATP production.	AP	1

Part C. 28 Marks.Time:60 Minutes (Cognitive Level:Apply(AP)/Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer.7 marks each.Answer all 4 Questions choosing among options * within each question

Qn No.	Question	CL	CO
11	A) You want to separate DNA fragments of 500 bp and 5 kb. Which electrophoresis method will you choose and why? OR B)	AP	3, 3

Qn No.	Question	CL	CO
	Apply thin layer chromatography to explain how would you separate amino acids from a mixture.		
12	A) Analyse the first, second and third laws of thermodynamics collectively with suitable examples OR B) Analyse how changes in ion permeability affect membrane potential?	AN	1, 1
13	A) Evaluate the principle and working of hearing aids, and assess their effectiveness in restoring hearing ability in different types of hearing loss. OR B) Evaluate how image formation in the eye is altered in myopia and hypermetropia, and suggest various corrective measures.	EV	2, 2
14	A) Construct a workflow to analyze cellular ultrastructure using TEM and SEM. OR B) Design a procedure to identify an unknown compound using IR spectroscopy.	CR	4, 4