JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS- 2026

B.Tech-4th Semester (BT)

COURSE CODE (CREDITS): 25B1WBT433 (3) MAX. MARKS: 35

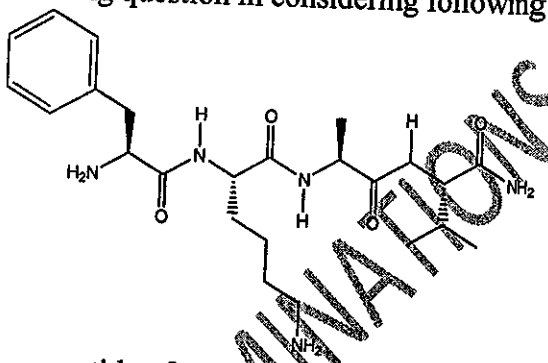
COURSE NAME: PEPTIDE THERAPEUTICS

COURSE INSTRUCTOR: DR. GOPAL S BISHT MAX. TIME: 2 Hour

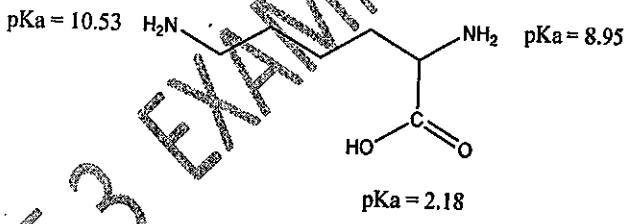
Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Use of calculator is allowed

Q.No	Question	CO	Marks
Q1	Answer the following question in considering following peptides.  a) Examine peptide fragmentation pattern of the following peptides in mass spectroscopy. b) Calculate its net charge at neutral pH. c) Analyze importance of MS/MS in peptides sequencing.	V	[3] [1] [2]
Q2	Gel permeation chromatography was carried out on a set of proteins of known M_r. The elution volumes and the M_r values are given below. A newly isolated protein has an elution volume form the same column of 58.0 mL. Estimate its M_r.	V	[4]

PROTEIN	Relative molecular mass (Da)	Elution Volume cm^3
A	160000	47
B	70000	55.2
C	45000	61.5
D	36000	67.3
E	29000	72.8
F	20000	84
G	14000	96.5

Q3	a) Host defense peptides (HDPs) are emerging as promising alternatives to conventional antibiotics. Critically analyze the mechanisms of action of host defense peptides against microbial pathogens. Evaluate their advantages and limitations in therapeutic applications. b) Critically explain the mechanisms of action of antihypertensive peptides in the regulation of blood pressure. list FDA-approved peptide-based antihypertensive agents. c) Explain physiological functions of Oxytocin in the human body. Illustrate how its structure is related to its biological activity. d) Explain the mechanism by which valinomycin acts as an ionophore e) Analyze the importance of studying conformation of peptides.	IV	[4] [3] [3] [3] [2]
Q4	Appraise stability issues of peptides and proteins and consequences for their pharmaceutical application.	III	[4]
Q5	Argue the need of peptidomimetics in research. What is conformational effect of following substitution a) D-amino acid or proline substitution b) dehydroamino acid	III	[4]
Q6	Justify the structure and charge of following amino acid at pH 1, pH 7, pH 9.5 and pH 13.  	II	[2]