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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2026

B.Tech-I Semester 4th (BT)

COURSE CODE (CREDITS): 25B1WBT433 (3)

MAX. MARKS: 25

COURSE NAME: PEPTIDE THERAPEUTICS

COURSE INSTRUCTOR: DR. GOPAL S BISHT

MAX. TIME: 1 Hour 30 Min

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 not allowed

Q.No	Question	CO	Marks
Q1	<p>a) Deduce the sequence of amino acids in a peptide from the following information: A) composition= phe+pro+glu+2 lys B) treatment with Edman reagent yielded PTH-glutamate: and C) trypsin, carboxypeptidase A, carboxypeptidase B did of release any smaller peptides or amino acids.</p> <p>b) Draw titration curve of glycine with NaOH. Predict the predominant form of glycine at pH 1, pH 6, and pH 11 during titration with NaOH.</p> <p>c) Analyze the cleavage specificity of Trypsin and Chymotrypsin and explain how their combined use improves peptide sequencing.</p>	II	[3+2+2]
Q2	<p>a) A solution of the peptide Ac-Trp-Tyr-Phe-Gly-NH₂ is prepared. At wavelength 280nm, the absorbance is 0.550 in a 1 cm cuvette. Calculate the molar concentration μM of the peptide. (Extinction coefficients epsilon at 280 nm: Trp = 5690 $\text{M}^{-1}\text{cm}^{-1}$, Tyr = 1280 $\text{M}^{-1}\text{cm}^{-1}$, Phe = 0).</p> <p>b) Explain the significance of ramachandaran plot</p>	I	[1.5+1.5]
Q3	<p>a) Evaluate techniques used in peptide characterization, including various chromatography, circular dichrosim, and UV spectrometry.</p> <p>b) Critically evaluate the shift from liquid-phase to Solid-Phase Peptide Synthesis (SPPS) in the context of research and development. Analyze the synthesis of the dipeptide H-Phe-Gly-OH justifying the choice of protecting groups and the chemical necessity of the coupling reagents used.</p>	II	[4] [6]

Q4	<p>a) A researcher uses Circular Dichroism (CD) to study a peptide. The spectrum shows a strong negative peak at 200 nm and a weak positive peak at 226nm. The researcher claims the peptide is an α-helix. Evaluate this claim based on standard CD signatures.</p> <p>b) Compare the elution profiles of Peptide X (Ac-Arg-Lys-Gly-Ala-NH₂) and Peptide Y (Ac-Phe-Trp-Leu-Val-NH₂) on a Reverse-Phase HPLC column c-18 using an Acetonitrile/Water gradient. Which elutes first, and why?</p> <p>c) Calculate the net charge of the peptide Glu-His-Ala-Lys-Asp at pH 7.0.</p>	III	<p>[2]</p> <p>[2]</p> <p>[1]</p>
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JUIT TEST-2 EXAMINATIONS- MARCH-2026