


**NAVRACHANA
UNIVERSITY**
a UGC recognized University

School: School of Science
Program/s: B.Sc-LS
Year: 2nd **Semester:** 3rd
Examination: End Semester Examination
Examination year: December - 2021

Course Code: CH259 **Course Name:** Biomolecules
Date: 08/12/2021
Time: 08:30 am to 10:30 am

Total Marks: 40
Total Pages: 2

Instructions:

Write each answer on a new page.

Use of a calculator is permitted.

Draw all relevant waveforms in answer sheet only.

* COs=Course Outcome mapping. # BTL=Bloom's Taxonomy Level mapping

Q. No.	Details	Marks	COs*	BTL#
Q.1	<p>(A) Glucose and Fructose are??? (Mark 1) (i) Functional isomers (ii) Metamerism isomers (iii) Positional isomers (iv) Tautomers</p> <p>(B) Number of possible isomers for glucose is (Mark 1) (i) 4 (ii) 8 (iii) 16 (iv) 20</p> <p>(C) The phenomenon in change in specific rotation in case of glucose is known as (i) Glucose Acetylation (ii) Mutarotation (iii) Oxidation of glucose (iv) None of the above (Mark 1)</p> <p>(D) Oxidation of glucose with bromine water gives (Mark 1) (i) Gluconic acid (ii) Glucaric acid (iii) Phenyl hydrazone (iv) Osazone</p> <p>(E) The components of poison ivy and poison oak that produce the characteristic itchy rash are catechol's substituted with long-chain alkyl groups. If you were exposed to poison ivy, which of the treatments below would you apply to the affected area? Justify your choice. (Marks 1+3)</p> <div style="text-align: center;"> <p>$pK_a \approx 8$</p> </div> <p>(a) Wash the area with cold water. (b) Wash the area with dilute vinegar or lemon juice. (c) Wash the area with soap and water. (d) Wash the area with soap, water, and baking soda (sodium bicarbonate).</p>	8	CO1 CO2 CO3	BT1, BT2 BT3 BTL4 BTL5

Q.2	(Q2) What is the H ⁺ concentration of a solution with pH of (a) 3.82; (b) 6.52	5	C01 C02 C03	BT1, BT2, BT3 BTL4
Q.3	In a hospital laboratory, a 10.0 mL sample of gastric juice, obtained several hours after a meal, was titrated with 0.1 M NaOH to neutrality; 7.2 mL of NaOH was required. The patient's stomach contained no ingested food or drink, thus assume that no buffers were present. What was the pH of the gastric juice?	5	C01 C02 C03	BT1, BT2, BT3 BTL4 BTL5 BTL6
Q.4	(Q4) Which is the conjugate base in each of the pairs below? (a) RCOOH, RCOO ⁻ (b) RNH ₂ , RNH ₃ ⁺ (c) H ₂ PO ₄ ⁻ , H ₃ PO ₄ (d) H ₂ CO ₃ , HCO ₃ ⁻	4	C01 C02	BT1, BT3, BT3
Q.5	Draw the structure of Ala-Ala-Ala. Identify the functional groups associated with pK ₁ (3.4, CO ₂ H) and pK ₂ (8.03, NH ₃ ⁺)	5	C01 C02 C03	BT1, BT2
Q.6	Glutenin, a wheat protein rich in disulfide bonds, is responsible for the cohesive and elastic character of dough made from wheat flour. Similarly, the hard, tough nature of tortoise shell is due to the extensive disulfide bonding in its α-keratin. What is the molecular basis for the correlation between disulfide-bond content and mechanical properties of the protein?	5	C01 C02 C03	BT1, BT2, BT3 BTL4 BTL5
Q.7	Calculate the following (a) Calculate the axial length of an α helix containing 78 amino acids (b) How long would the polypeptide chain be if it were fully extended? [Given 5.4 Å for every 3.6 residues]	5	C01 C02 C04	BT1, BT2, BT3 BTL4 BTL5
	OR			
Q.8	Describe role of metal ions in Biology Define epimers and Anomers with examples	3	C01	BT1 BT2

*****End of Question Paper*****