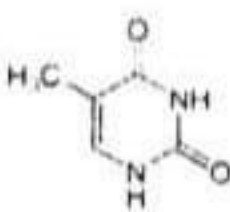
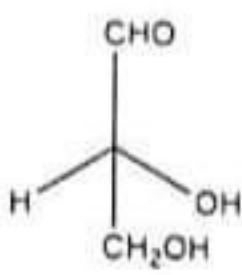


**VIT**Vellore Institute of Technology
(Deemed to be University under section 3 of UGE Act, 1956)**SCHOOL OF BIO SCIENCES AND TECHNOLOGY
CONTINUOUS ASSESSMENT TEST -I
FALL SEMESTER 2025-2026**

Programme Name & Branch	: B Tech, Biotechnology	
Course Code	: BABIT101	
Course Name	: Biochemistry	
Slot	: E1/TE1	
Faculty Name(s)	: C Shanthi; V Sabareesh	
Class Number(s)	: VL2025260107004; VL2025260107011	
Date of Examination	: 21/8/25	
Exam Duration	: 90 minutes	Maximum Marks: 50
General instruction(s):		

- Draw chemical structures wherever required
- Answer all questions

Q. No	Question	Marks
1.	Write the Henderson-Hasselbalch equation and explain all the terms in it. Calculate the pH of the solution containing 0.05 M lactic acid and 0.015 M lactate. (K_a : Lactic Acid = 1.38×10^{-4}) $pH = 0.52038$	10
2.	(a) What is hydrogen bonding? Write about the hydrogen bonding properties of water. (b) Comment on the solubility of the following compounds in water. (i)  (ii) 	6 4
3.	(a) What is mutarotation? Explain with an example. (4 marks) (b) Calculate free energy change for the following reaction at 30°C. Fructose - 6 - Phosphate $\rightleftharpoons$ Glucose - 6 - Phosphate; $K_{eq.} = 1.97$; ($R = 8.314 \text{ JK}^{-1}\text{mol}^{-1}$) $\Delta G^\circ = -741.8 \text{ J}$	10
4.	a) Identify the following molecule. How many stereoisomers are possible for this molecule? Draw those stereoisomers. Justify your answer. (5) (b) Write the functional isomer of the given molecule. Does it have stereoisomers or <u>not</u> ? Justify your answer.(5) 	10
5.	(a) Comment on the cell wall features of the plant and bacteria. (5 Marks) (b) What are proteoglycans? (5 Marks)	10