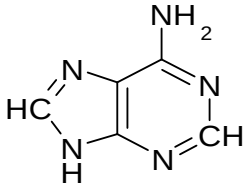
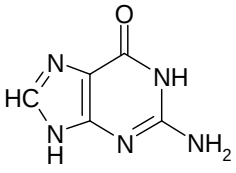
Biomolecular Structure, Interaction & Dynamics ***QUIZ 2 - Monsoon 2020***

Time: 25 Minutes ***Max. Marks: 30***

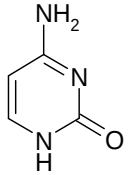
Q1.(a) What is the name of the molecule? Is it a purine or a pyrimidine? [1]



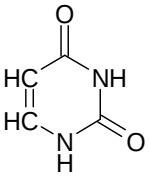
Q1(b) Name the molecules shown below and pick the one which forms a Watson Crick base pair with the molecule shown in *(a)* above. [4]



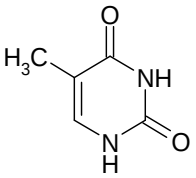
(i)



(ii)

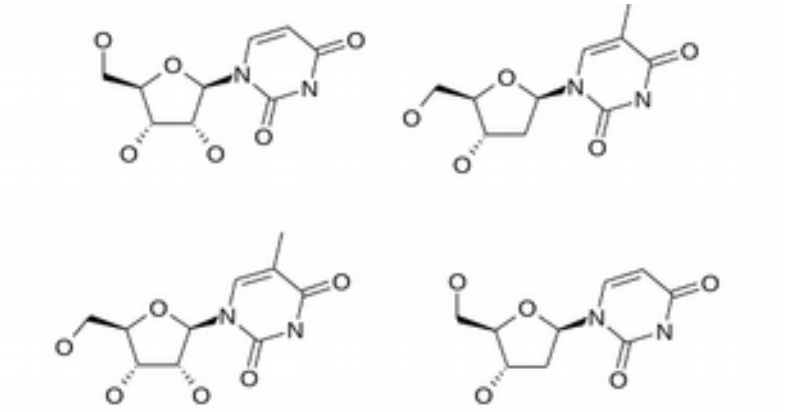


(iii)



(iv)

Q1(c)



Which of the above structures represents a nucleoside likely to be present in a DNA molecule? Redraw its structure showing all the hydrogen atoms. Number the carbon atoms in the sugar ring and clearly depict the 3′ and 5′ OH groups. [5]

Q1(d) Discuss the essential differences between DNA and RNA structures. [6]

Q2 (a) How many residues must an α helix contain in order to span the 30-Å-thick hydrocarbon core of a lipid bilayer? [2]

(b) How many residues in a β sheet are required to span this bilayer core if it is inclined by 30° with respect to the normal to the membrane plane? [2]

(c) Why do most transmembrane α - helices and β-strands have more than these minimum numbers? [2]

Q2 (d) Illustrate the torsional degrees of freedom in a nucleotide. [4]

Q3 (a) What are non-bonded forces? .Explain briefly. [4]