

# Unit 3 - Week 1: Nucleic acids and proteins

## Course outline

How does an NPTEL online course work?

### Week 0: Prerequisite

### Week 1: Nucleic acids and proteins

- Lec 1: Importance of Biomolecules
- Lec 2 : DNA double helix: Chemical parameters
- Lec 3 : DNA and Proteins

### Quiz : Assignment 1

- Lecture notes: week 1

- Weekly feedback form for week 1

- Solution for Assignment "1"

### Week 2: Nucleic acids and proteins

### Week 3 : Synthesis of Nucleobases and Nucleotides

### Week 4 : DNA Replication, Polymerases, DNA Sequencing and PCR

### Week 5 : DNA Replication, Polymerases, DNA Sequencing and PCR

### Week 6: DNA damage, mutation and cancer

### Week 7: DNA to proteins: transcription, translation and genetic code

### Week 8: Protein Sequencing and Solid Phase Peptide Synthesis (SPPS)

### Week 9: Chemical Synthesis of Peptides and its therapeutic applications; Spectroscopic techniques for biomolecules.

### Week 10: Modern techniques for biomolecules study, purification and characterization; Molecular probes

### Week 11: Molecular probes and Chemistry of carbohydrates

### Week 12: Chemistry of carbohydrates and Recap

### Download Videos

## Assignment 1

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

**Due on 2020-02-12, 23:59 IST.**

1) The complementary strand for the following DNA sequence 5'-ATGCTCAGTA-3' is

1 point

- (a) 5'-TACGAGTCAT-3'  
 (b) 5'-TACTGAGCAT-3'  
 (c) 3'-TACTGAGCAT-5'

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(b) 5'-TACTGAGCAT-3'

2) In a given dsDNA, the number of moles of thymine is 0.25 and that of guanine is 0.30. the number of moles of cytosine and adenine , respectively will be:

1 point

- (a) 0.25 and 0.25  
 (b) 0.30 and 0.275  
 (c) 0.30 and 0.25  
 (d) 0.25 and 0.30

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(c) 0.30 and 0.25

3) In the question 2, the weight of cytosine and adenine molecules will be: [Given molecular weight of Adenine=135 g/mol, thymine=135 g/mol, thymine=126 g/mol, guanine=151 g/mol and cytosine=111 g/mol]

1 point

- (a) 33.3 g and 33.75 g  
 (b) 27.7 g and 40.5 g  
 (c) 45.3 g and 31.5 g  
 (d) 37.75 g and 37.89 g

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(a) 33.3 g and 33.75 g

4) A ssDNA has a length of 120 nm. If 30 nm is cut off by a restriction enzyme and eliminated approximately, how many bases will remain:

1 point

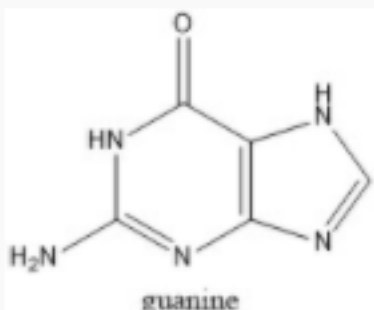
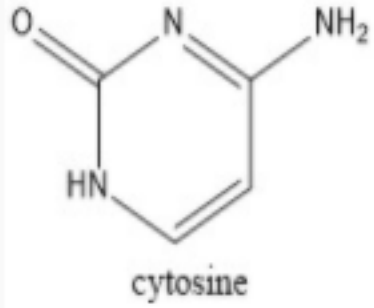
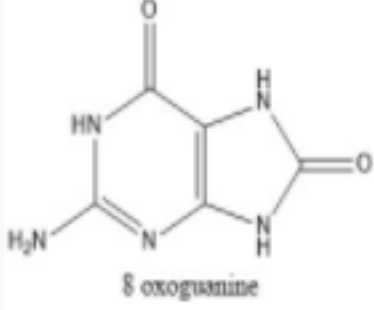
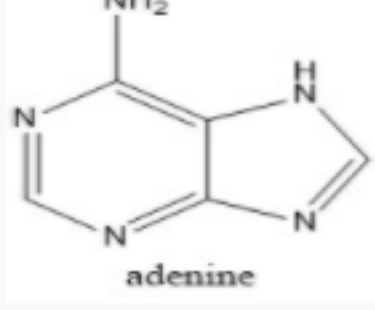
- (a) 353  
 (b) 87  
 (c) 520  
 (d) 264

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(d) 264

5) ATP is the source of energy in living cells. The nucleobase present in it is:

1 point

-   
 guanine  
   
 cytosine  
   
 oxoguanine  
   
 adenine

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(d) adenine

6) The preferred sugar conformation in DNA is:

1 point

- (a) C-2' endo twist  
 (b) C-3' endo twist  
 (c) C-2' exo twist  
 (d) C-3' exo twist

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(a) C-2' endo twist

7) Among the following, which will have higher melting temperature:

1 point

- (a) A double stranded RNA  
 (b) A double stranded DNA  
 (c) A double strand between a DNA and a RNA

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(b) A double stranded DNA

8) The number of major grooves in a double stranded B-DNA of 1024 base pair is:

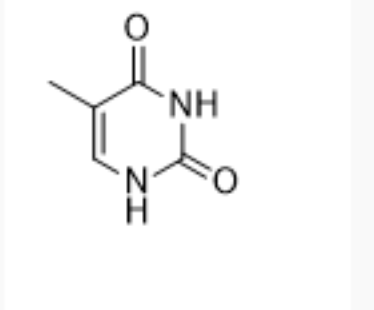
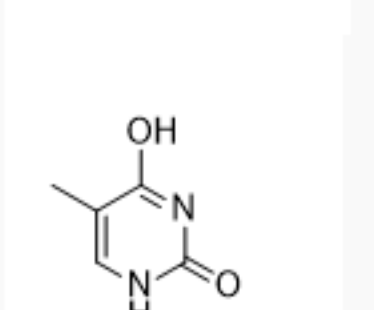
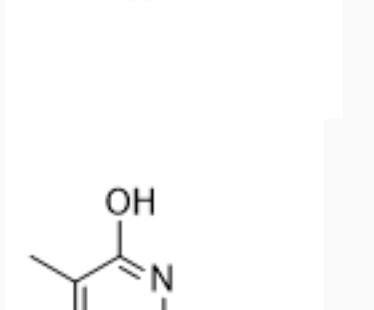
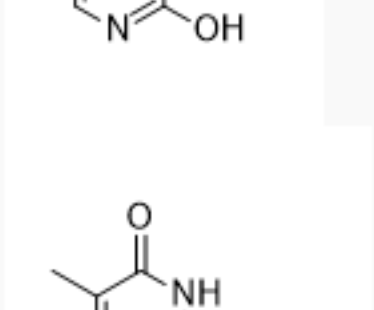
No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(Type: Range) 102.0,102.4

1 point

9) At pH=10, Thymine will exist as:

1 point

-   
   
   
 

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(b) 