PYQSide PYQSide.com — free PYQs with solutions Powered by PrepBlink

NEET MOLECULAR BASIS OF INHERITANCE — THE DNA: STRUCTURE AND PACKAGING OF DNA HELIX — PYQS

Max. Marks: 132 **Questions:** 33

Section A (MCQ) — 33 questions

Q.1 Which of the following statements are correct with reference to packaging of DNA helix ?

A. Histones are organized to form a unit of eight molecules called histone octamer.
B. Histones are negatively charged basic proteins.
C. Histones are rich in the basic amino acid residues – lysine and arginine.
D. The positively charged DNA is wrapped around the histone octamer to form nucleosome.
E. The packaging of chromatin at higher levels requires an additional set of proteins called non-histone chromosomal proteins.

Choose the correct answer from the options given below : [NEET (UG) 2026]

(1) B, D and E only (2) A, B and D only
(3) C, D and E only (4) A, C and E only

Scan or tap for the full solution

Q.2 Histones are enriched with - [NEET (UG) 2025]

(1) Phenylalanine & Leucine
(2) Phenylalanine & Arginine
(3) Lysine & Arginine
(4) Leucine & Lysine

Scan or tap for the full solution

Q.3 Match **List-I** with **List-II**: [RE-NEET (UG) 2024]

List-I		List-II	
A.	Histones	I.	Loosely packed chromatin
B.	Nucleosome	II.	Densely packed chromatin
C.	Euchromatin	III.	Positively charged basic proteins
D.	Heterochromatin	IV.	DNA wrapped around histone octamer

(1) A-IV, B-III, C-II, D-I
(2) A-III, B-I, C-IV, D-II
(3) A-II, B-III, C-IV, D-I
(4) A-III, B-IV, C-I, D-II

Scan or tap for the full solution

Q.4 Given below are two statements:

Statement-I: In prokaryotes, the positively charged DNA is held with some negatively charged proteins in a region called nucleoid.

Statement-II: In eukaryotes, the negatively charged DNA is wrapped around the positively charged histone octamer to form nucleosome.

In the light of the above statements, choose the correct answer from the options given below: [NEET (UG) 2023]

(1) Both Statement-I and Statement-II are false.
(2) Statement-I is correct but Statement-II is false.
(3) Statement-I is incorrect but Statement-II is true.
(4) Both Statement-I and Statement-II are true.

Scan or tap for the full solution

Q.5 Read the following statements and choose the set of correct statements:

A. Euchromatin is loosely packed chromatin
B. Heterochromatin is transcriptionally active
C. Histone octamer is wrapped by negatively charged DNA in nucleosome
D. Histones are rich in lysine and arginine
E. A typical nucleosome contains 400 bp of DNA helix

Choose the correct answer from the options given below : [NEET (UG) 2022]

(1) (B), (D), (E) only (2) (A), (C), (D) only
(3) (B), (E) only (4) (A), (C), (E) only

Scan or tap for the full solution

Q.6 If the length of a DNA molecule is 1.1 metres, what will be the approximate number of base pairs? [NEET (UG) 2022]

(1) 3.3×10^9 bp (2) 6.6×10^9 bp
(3) 3.3×10^6 bp (4) 6.6×10^6 bp

Scan or tap for the full solution

Q.7 Match **List-I** with **List-II**:

List - I		List - II	
a.	Bacteriophage φX174	i.	48502 base pairs
b.	Bacteriophage lambda	ii.	5386 nucleotides
c.	*Escherichia coli*	iii.	3.3×10^9 base pairs
d.	Haploid content of human DNA	iv.	4.6×10^6 base pairs

Choose the correct answer from the options given below: [NEET (UG) 2022 (Phase 2)]

(1) (a)-(i), (b)-(ii), (c)-(iv), (d)-(iii)
(2) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)
(3) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
(4) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

Scan or tap for the full solution

Q.8 If A and C make 30% and 20% of DNA, respectively, what will be the percentage composition of T and G? [NEET (UG) 2022 (Phase 2)]

(1) T : 20%, G : 20% (2) T : 20%, G : 30%
(3) T : 30%, G : 20% (4) T : 30%, G : 30%

Scan or tap for the full solution

Q.9 If Adenine makes 30% of the DNA molecule, what will be the percentage of Thymine, Guanine and Cytosine in it? [NEET (UG) 2021]

(1) T : 20 ; G : 25 ; C : 25
(2) T : 20 ; G : 30 ; C : 20
(3) T : 20 ; G : 20 ; C : 30
(4) T : 30 ; G : 20 ; C : 20

Scan or tap for the full solution

Q.10 Which one of the following statements about histones is wrong? [NEET (UG) 2021]

(1) Histones carry positive charge in the side chain
(2) Histones are organized to form a unit of 8 molecules
(3) The pH of histones is slightly acidic
(4) Histones are rich in amino acids - Lysine and Arginine

Scan or tap for the full solution

Q.11 If the distance between two consecutive base pairs is 0.34 nm and the total number of base pairs of a DNA double helix in a typical mammalian cell is 6.6×10^9 bp, then the length of the DNA is approximately [NEET (UG) 2020]

(1) 2.7 meters (2) 2.0 meters
(3) 2.5 meters (4) 2.2 meters

Scan or tap for the full solution

Q.12 Which of the following statements is correct? [NEET (UG) 2020]

(1) Adenine does not pair with thymine
(2) Adenine pairs with thymine through one H-bond
(3) Adenine pairs with thymine through two H-bonds
(4) Adenine pairs with thymine through three H-bonds

Scan or tap for the full solution

Q.13 Purines found both in DNA and RNA are: [NEET (UG) 2019]

(1) Guanine and cytosine
(2) Cytosine and thymine
(3) Adenine and thymine
(4) Adenine and guanine

Scan or tap for the full solution

Q.14 The association of histone H_1 with a nucleosome indicates : [NEET 2017]

(1) DNA replication is occurring
(2) Transcription is occurring
(3) The DNA is condensed into a Chromatin Fibre
(4) The DNA double helix is exposed

Scan or tap for the full solution

Q.15 Which one of the following is not applicable to RNA? [AIPMT 2015]

(1) Complementary base pairing
(2) 5' phosphoryl and 3' hydroxyl ends
(3) Heterocyclic nitrogenous bases
(4) Chargaff's rule

Scan or tap for the full solution

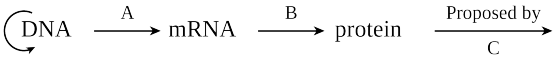
Q.16 Identify the correct order of organisation of genetic material from largest to smallest : [AIPMT 2015]
(1) Chromosome, genome, nucleotide, gene
(2) Genome, chromosome, nucleotide, gene
(3) Genome, chromosome, gene, nucleotide
(4) Chromosome, gene, genome, nucleotide

Scan or tap for the full solution

Q.17 In sea urchin DNA, which is double stranded, 17% of the bases were shown to be cytosine. The percentages of the other three bases expected to be present in this DNA are [AIPMT 2015 (Cancelled)]
(1) G 17%, A 16.5%, T 32.5%
(2) G 17%, A 33%, T 33%
(3) G 8.5%, A 50%, T 24.5%
(4) G 34%, A 24.5%, T 24.5%

Scan or tap for the full solution

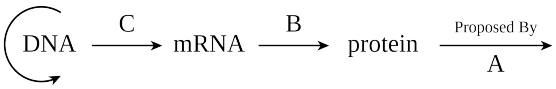
Q.18 The diagram shows an important concept in the genetic implication of DNA. Fill in the blanks A to C. [NEET 2013]



(1) A-translation B-extension C-Rosalind Franklin
(2) A-translation B-transcription C-Erwin Chargaff
(3) A-transcription B-translation C-Francis Crick
(4) A-transcription B-replication C-James Watson

Scan or tap for the full solution

Q.19



The figure gives an important concept in the genetic implication of DNA. Fill the blanks A, B and C. [NEET 2013 (Karnataka)]
(1) A - Erwin Chargaff
B - translation
C - replication
(2) A - Maurice Wilkins
B - transcription
C - translation
(3) A - Francis Crick
B - translation
C - transcription
(4) A - James Watson
B - replication
C - extension

Scan or tap for the full solution

Q.20 What are those structures that appear as 'beads-on-string' in the chromosomes when viewed under electron microscope ? [AIPMT 2011 (Prelims)]
(1) Nucleosomes (2) Genes
(3) Nucleotides (4) Base pairs

Scan or tap for the full solution

Q.21 The 3'-5' phosphodiester linkages inside a polynucleotide chain serve to join - [AIPMT 2010 (Mains)]
(1) One nucleotide with another nucleotide
(2) One nitrogenous base with pentose sugar
(3) One nucleoside with another nucleoside
(4) One DNA strand with the other DNA strand

Scan or tap for the full solution

Q.22 Which one of the following statements about the particular entity is true? [AIPMT 2010 (Mains)]
(1) Nucleosome is formed of nucleotides
(2) Centromere is found in animal cells, which produces aster during cell division
(3) The gene for producing insulin is present in every body cell
(4) DNA consists of a core of eight histones

Scan or tap for the full solution

Q.23 Which one of the following does not follow the central dogma of molecular biology ? [AIPMT 2010 (Prelims)]
(1) *Mucor* (2) HIV
(3) *Chlamydomonas* (4) Pea

Scan or tap for the full solution

Q.24 In the DNA molecule: [AIPMT 2008]

(1) the total amount of purine nucleotides and pyrimidine nucleotides is not always equal

(2) there are two strands which run antiparallel one in $5' \longrightarrow 3'$ direction and other in $3' \longrightarrow 5'$

(3) there are two strands which run parallel in the $5' \longrightarrow 3'$ direction

(4) the proportion of adenine in relation to thymine varies with the organism

Scan or tap for the full solution

Q.25 Which one of the following pairs of nitrogenous bases of nucleic acids is wrongly matched with the category mentioned against it? [AIPMT 2008]

(1) Thymine, Uracil — Pyrimidines

(2) Guanine, Adenine — Purines

(3) Uracil, Cytosine — Pyrimidines

(4) Adenine, Thymine — Purines

Scan or tap for the full solution

Q.26 One turn of the helix in a B-form DNA is approximately - [AIPMT 2006]

(1) 20 nm (2) 3.4 nm (3) 2 nm (4) 0.34 nm

Scan or tap for the full solution

Q.27 Antiparallel strands of a DNA molecule means that- [AIPMT 2006]

(1) The phosphate groups at the start of two DNA strands are in opposite position (pole)

(2) One strand turns anti-clockwise

(3) One strand turns clockwise

(4) The phosphate groups of two DNA strands, at their ends, share the same position

Scan or tap for the full solution

Q.28 Which one of the following makes use of RNA as a template to synthesize DNA - [AIPMT 2005]

(1) Reverse transcriptase

(2) DNA dependent RNA polymerase

(3) RNA polymerase

(4) DNA polymerase

Scan or tap for the full solution

Q.29 The following ratio is generally constant for a given species :- [AIPMT 2004]

(1) $\frac{A+C}{T+G}$ (2) $\frac{G+C}{A+T}$ (3) $\frac{A+G}{C+T}$ (4) $\frac{T+C}{G+A}$

Scan or tap for the full solution

Q.30 The telomeres of eukaryotic chromosomes consist of short sequences of [AIPMT 2004]

(1) Adenine rich repeats

(2) Cytosine rich repeats

(3) Thymine rich repeats

(4) Guanine rich repeats

Scan or tap for the full solution

Q.31 In a DNA percentage of thymine is 20% then what is the percentage of guanine : - [AIPMT 2002]

(1) 40% (2) 20% (3) 30% (4) 60%

Scan or tap for the full solution

Q.32 Length of one loop of B-DNA: [AIPMT 2000]

(1) 20 nm. (2) 10 nm. (3) 3.4 nm. (4) 0.34 nm.

Scan or tap for the full solution

Q.33 Similarity in DNA and RNA: [AIPMT 2000]

(1) Both have similar sugar

(2) Both are genetic material

(3) Both have similar pyrimidine

(4) Both are polymer of nucleotides

Scan or tap for the full solution

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	4	3	4	3	2	1	4	3	4	3	4
Ques.	12	13	14	15	16	17	18	19	20	21	22
Ans.	3	4	3	4	3	2	3	3	1	1	3
Ques.	23	24	25	26	27	28	29	30	31	32	33
Ans.	2	2	4	2	1	1	2	4	3	3	4