Molecular Basis of Inheritance

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1. DNA is a

(a) long polymer of deoxyribonucleotides

(b) short polymer of deoxyribonucleotides

(c) monomer polymer of deoxyribonucleotides

(d) long polymer of ribonucleotides

2. 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 6.6×109 bp then the length of the DNA is approximately

(a) 2.5 m

(b) 2.2 m

(c) 2.7 m

(d) 2.0 m

3. Which of the following are nucleotides?

(a) adenosine, cytidilic acid, cytosine

(b) adenylic acid, cytidilic acid, gunaylic acid

(c) cytidine, adenine, adenylic acid

(d) uracil, thymidine, thymidylic acid

4. A nucleoside differs from in nucleotide. It lacks the

(a) base

(b) sugar

(c) phosphate group

(d) hydroxyl group

5. In a DNA strand the nucleotides are linked together by

(a) glycosidic bonds

(b) phosphodiester bonds

(c) peptide bonds

(d) hydrogen bonds

6. In DNA 20% bases are adenine what percent of bases are pyrimidine?

(a) 30%

(b) 60%

(c) 50%

(d) 20%

7. Nucleosome is the repeating unit of _____ in a nucleus.

(a) chromosome

(b) genes

(c) chromatin

(d) chromosome

8. Nucleosome consists of

(a) nucleolus

(b) genes

(c) microfilaments

(d) histones

9. The packaging of chromatin at higher level requires additional set of proteins that are collectively referred to as

(a) histone protein

(b) non-histone protein

(c) basic protein

(d) histone octamer

10. Lightly stained part of chromatin which remains loosely packed is

(a) euchromatin

(b) heterochromatin

(c) chromatosome

(d) chromonemata

11. Densely packed and stain transcription inactive part of chromatin is

(a) euchromatin

(b) chromatosome

(c) heterochromatin

(d) chromosome

12. Who introduced the transforming principle?

(a) Federal Griffith

(b) Oswald Avery

(c) Collin McLeod

(d) Maclyn McCarty

13. S-type strain of Streptococcus pneumoniae is

(a) capsulated, virulent, smooth

(b) non-capsulated, avirulent, rough c

(c) capsulated, avirulent, rough

(d) non-capsulated, virulent, smooth

14. What happened when heat killed S cells along with live R cells were injected into mice?

(a) mice survived and showed live S cells

(b) mice died and showed life S cells

(c) mice survived and showed live R cells

(d) mice died and showed live R cells

15. Transformation experiment of Griffith was approved by

(a) Griffith himself

(b) Avery, MacLead, McCarty

(c) Meselson

(d) Breadle and Tatum

16. The result of which of the following reaction experiments carried out by Avery et at., on Streptococcus pneumoniae has proved conclusively that DNA is the genetic material?

(a) Live R-strain + DNA from S-strain + RNase

(b) Live R-strain + DNA from S-strain + DNase

(c) Live R-strain + Denatured DNA of S-strain + Protease

(d) Heat killed R-strain + DNA from S-strain + DNase

17. Hershey and Chase used 35S and 32P to prove that DNA is a genetic material. Their experiments prove that DNA as genetic material because

(a) progeny viruses retained 32P, but not 35S

(b) retention of 32P in progeny viruses indicated that DNA was passed on

(c) loss of 35S in progeny viruses indicated that proteins were not passed on

(d) All of the above

18. Match the following.

COLUMN 1	**COLUMN 2**
(A) F Miescher	(i) Nuclein
(B) Griffith	(ii) Streptococcus pneumoniae
(C) Hershey and Chase	(iii) Bacteriophage
(D) Watson and Crick	(iv) DNA double helix

(a) (A) – (ii), (B) – (iv) , (C) – (iii), (D) – (i)

(b) (A) – (i), (B) – (iv) , (C) – (iii), (D) – (ii)

(c) (A) – (i), (B) – (ii) , (C) – (iii), (D) – (iv)

(d) (A) – (i), (B) – (iii) , (C) – (iv), (D) – (ii)

19. Which group present in RNA nucleotides is very reactive and makes RNA liable and easily degradable than DNA?

(a) 3-OH' group at every nucleotide

(b) 2-OH' group on ribose sugar

(c) 3-OH' group on ribose sugar

(d) 4-OH' group on ribose sugar

20. A molecule to act as a genetic material has the following properties

(I) should be able to replicate

(II) should be structurally more stable

(III) should be more reactive liable

(IV) should provide scope for slow changes

Choose the correct option.

(a) I, II and III are correct

(b) III alone is correct

(c) III and IV are correct

(d) I, II and IV are correct

21. The first genetic material could be

(a) protein

(b) carbohydrate

(c) DNA

(d) RNA

22. Which one of the following option is correct?

(I) DNA has evolved from RNA with chemical modification

(II) DNA being complementary double-stranded resists strangers by a process of repair

(III) RNA being a catalyst is reactive and unstable

(a) I & II

(b) II & III

(c) I & III

(d) I, II & III

23. Who experimentally proved the semi conservative mode of DNA replication?

(a) Matthew Meselson

(b) Franklin Stahl

(c) both (a) and (b)

(d) Watson and Crick

24. If Meselson and Stahl's experiment is continued for four generation in bacteria, the ratio of

15N/15N : 15N/14N : 14N/14N

containing DNA in the fourth generation would be

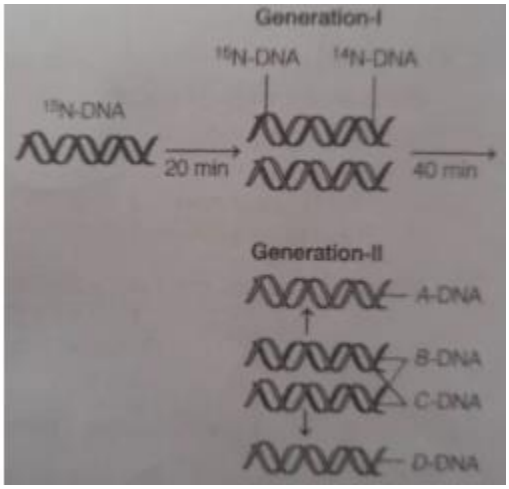
(a) 1:1:0

(b) 1:4:0

(c) 0:1:3

(d) 0:1:7

25. Given diagram depicts the experiment of Meselson and Stahl. Identify the type of isotopic DNA formed after 40 minutes (A, B, C & D)



(a) A-14N-DNA, B-15N-DNA, C-14N-DNA, D-15N-DNA

(b) A-14N-DNA, B-15N-DNA, C-14N-DNA, D-14N-DNA

(c) A-14N-DNA, B-14N-DNA, C-14N-DNA, D-15N-DNA

(d) A-14N-DNA, B-15N-DNA, C-15N-DNA, D-15N-DNA

26. During DNA replication, okazaki fragments are used to elongate

(a) the leading strand towards replication fork

(b) the lagging strand towards replication fork

(c) the leading strand away from replication fork

(d) the lagging strand away from the replication fork

27. During DNA replication the term leading strand is applied to the one which replicates in direction continuously.

(a) true

(b) false

(c) cannot say

(d) partially true or false

28. Discontinuous synthesis of DNA occurs in one strand, because

(a) DNA molecule been synthesized is very long

(b) DNA dependent DNA polymerase cattle lysis catalyzes polymerization only in one direction ($5' \rightarrow 3'$)

(c) it is more efficient process

(d) DNA ligase has to have a rule

29. Deoxyribonucleoside triphosphate serves dual purposes of

(I) acting as a substrate

(II) acting as an enzyme

(III) providing energy for polymerization

(IV) increasing the rate of reaction

Choose the correct option.

(a) I & II

(b) II & III

(c) III & IV

(d) I & III

30. The process of copying genetic information from one strand of the DNA into are in is termed as

(a) translation

(b) transamination

(c) replication

(d) transcription

31. Both the strands of DNA are not copied during transcription because RNA molecules with different sequences will be formed?

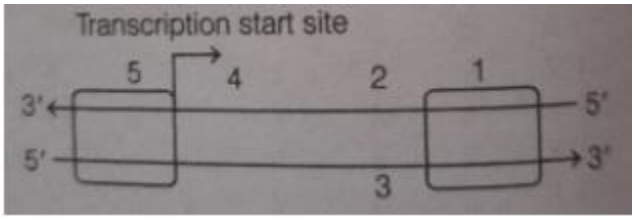
(a) true

(b) false

(c) cannot say

(d) partly true or false

32. In the given figure find out A-E



(A) promoter site

(B) structural gene

(C) terminator site

(D) template strand

(E) coding strand

(a) (A) – 5, (B) – 1, (C) – 4, (D) – 2, (E) – 3

(b) (A) – 5, (B) – 1, (C) – 4, (D) – 3, (E) – 2

(c) (A) – 5, (B) – 4, (C) – 1, (D) – 2, (E) – 3

(d) (A) – 1, (B) – 4, (C) – 5, (D) – 2, (E) – 3

33. If the coding strand has the sequence 5′-ATCGATCH-3′ then find out the sequence of non coding strand.

(a) 3′-TAGCTAGC-5′

(b) 5′-TACGTACG-3′

(c) 5′-UAGCUAGC-3′

(d) 5′-UACFUACG-3′

34. The segment of DNA coding for a polypeptide is called

(a) muton

(b) recon

(c) cistron

(d) exon

35. With regard to mature mRNA in eukaryotes

(a) exons and introns do not appear in the mature RNA

(b) exons appear, but introns do not appear in the mature RNA

(c) introns appear, but exons do not appear in the mature RNA

(d) both exons and introns appear in the mature RNA

36. Match the following.

COLUMN 1	**COLUMN 2**
(A) RNA polymerase-I	(I) tRNA, 5sr RNA. snRNAs
(B) RNA polymerase-II	(II) rRNA (28S, 18S and 5.8S)
(C) RNA polymerase-III	(III) hnRNA

(a) (A) – (I), (B) – (III), (C) – (II)

(b) (A) – (I), (B) – (II), (C) – (III)

(c) (A) – (II), (B) – (III), (C) – (I)

(d) (A) – (III), (B) – (II), (C) – (I)

37. Match the following.

COLUMN 1	**COLUMN 2**

(A) Sigma factor	(I) Termination
(B) Capping	(II) Initiation
(C) Tailing	(III) Methyl guanosine triphosphate is added to 5′ end
(D) Rho factor	(IV) Adenylate residues are added at 3′ end

(a) (A) – (IV), (B) – (I), (C) – (II), (D) – (III)

(b) (A) – (II), (B) – (III), (C) – (IV), (D) – (I)

(c) (A) – (I), (B) – (III), (C) – (IV), (D) – (II)

(d) (A) – (III), (B) – (II), (C) – (I), (D) – (IV)

38. Genetic code

(a) is a relationship between sequence of DNA or mRNA to polypeptide

(b) triplet based on mRNA

(c) determines the sequence of amino acid in polypeptide

(d) all of the above

39. From the following, identify the correct combination of salient features of genetic code.

(a) universal, non-ambigous, overlapping

(b) degenerate, overlapping, commaless

(c) universal, ambiguous, degenerate

(d) degenerate, universal, non-ambigous

40. Because most of the amino acid are represented by more than one codon, the genetic code is

(a) overlapping

(b) wobbling

(c) degenerate

(d) generate

41. Codons are non-ambiguous, which means that one codon codes for

(a) more than one amino acid

(b) to amino acid

(c) only one amino acid

(d) nonsense amino acids

42. The terminator codons are

(a) UAA, UAG, UGA

(b) AUG, UAG, UGA

(c) UAC, AUG, UAG

(d) DCC, UAA, CAC

43. Match the following.

COLUMN 1	**COLUMN 2**
(A) UUU	(I) Alanine
(B) CCC	(II) Glycine
(C) AAA	(III) Lysine
(D) GGG	(IV) Proline
	(V) Phenylalanine

(a) (A) – (IV), (B) – (V), (C) – (II), (D) – (III)

(b) (A) – (V), (B) – (IV), (C) – (III), (D) – (II)

(c) (A) – (I), (B) – (III), (C) – (IV), (D) – (V)

(d) (A) – (II), (B) – (III), (C) – (IV), (D) – (V)

44. Point mutation may occur due to

(a) alteration in DNA sequence

(b) change in a single base pair of DNA

(c) deletion of segment of DNA

(d) gain of segment in DNA

45. Which mutation of the genetic basis give the proof that codon is triplet and reads in a contagious manner?

(a) frameshift mutation

(b) point mutation

(c) both (a) and (b)

(d) inversion mutation

46. Which are true about tRNA?

(I) It binds with an amino acid at its 3′ end

(II) It has five double-stranded regions

(III) It has a codon at one end which recognises the anticodon on messenger RNA

(IV) it looks like clover leaf in the three-dimensional structures

(a) I only

(b) II & III

(c) III & IV

(d) I & IV

47. The process of polymerisation of amino acids to form a polypeptide is

(a) transcription

(b) replication

(c) translation

(d) polymerization

48. The first phase of translation is

(a) recognition of DNA molecule

(b) amino acylation of tRNA

(c) recognition of an anticodon

(d) binding of mRNA to ribosome

49. Charging (aminoacylation) of tRNA involves the attachment of

(a) amino acid to mRNA

(b) amino acid to tRNA

(c) amino acid to rRNA

(d) acidic amino acid to ribosome

50. Aminoacylation of tRNA helps in binding to ribosome?

(a) D-loop

(b) T-loop

(c) Variable loop

(d) none of these

Answer

1. (a)

2. (b)

The distance between two consecutive base pair is 0.34 nm. The length of DNA double helix in a typical mammalian cell can be calculated by multiplying the total number of bp with distance between the two consecutive bp, i.e. 6.6 x 109 bp x 0.34 x 10-9 m/bp = 2.2 m

3. (b)

Adenylic acid, cytidilic acid and guanylic acid are nucleotides. A nucleotide is composed of three components which are nitrogen base (adenosine, cytosine, guanine), ribose sugar and a phosphate group. These are monomer unit of nuclear nucleic acid RNA and DNA.

Adenine, cytidine, thymidine are nucleosides. Uracil, cytosine and adenosine are nitrogenous base.

4. (c)

Nitrogenous base is attached to the pentose sugar by an N-glycosidic linkage to form a nucleoside,i.e.

Nucleoside = Nitrogen base + Pentose Sugar

When a phosphate group is attached to the 5′-OH of a nucleoside through phosphodiester linkage, a nucleotide is formed, i.e. Nucleotides = Nitrogen base + Pentose sugar + phosphate (PO4)

Therefore, a nucleosides differs from a nucleotides as it lacks phosphate group.

5. (b)

6. (c)

The percentage of bases which are pyrimidines is 50 %. According to Chargaff's rule

+G (Purines) = C+ (Pyrimidines) = 50%

i.e., If = 20%, then T = 20%

C + T = 50%

C = 50% – 20% = 30%

Total percentage of pyrimidine bases (T + C) are 20 + 30 = 50%

7. (c)

Chromatin are thread likes stained bodies seen in nucleus. The nucleosome is repeating unit in chromatin and seen as 'beads on string' when viewed under electron microscope.

8. (d)

Histones are main structural proteins found in Eukaryotic cells. The nucleosome core is made of four types of histone proteins, i.e. H2A, H2B, H3 and H4 occurring in pairs. 200 bp of DNA helix wraps around the nucleosome by turns, plugged by H1 histone proteins. So, nucleosome consists of histones.

9. (b)

The packaging of chromatin and higher level requires an additional set of basic proteins called non-histone protein. These are heterogeneous group of proteins that play important role in nucleosome remodeling, DNA processing etc.

10. (a)

The loosely packed form of DNA in the chromosome is called euchromatin.

11. (c)

At some places chromatin is densely packed to form darkly stained heterochromatin. It is transcriptionally inactive.

12. (a)

Transforming principle (Griffith's experiment) was introduced by Frederick Griffith. He conducted a series of experiments with Streptococcus pneumoniae and found that living organism had changed in physical form.

13. (a)

14. (b)

As a part of his experiment, Griffith tried to inject the mice with heat killed S bacteria. Unsurprisingly, the heat kill as bacteria did not cause disease in mice.

However, when harmless R Bacteria were combined with harmless heat kill S bacteria and injected into another mice, it developed pneumonia and died. When Griffith took a blood sample from the dead mouse, he found that it contains a living S bacteria.

15. (b)

Oswald Avery, Colin MacLeod and Maclyn McCarty work to determine the biochemical nature of transforming principle in Griffith experiment.

16. (b)

R-strain is rough and harmless, while the S-strain is smooth and virulent form of Streptococcus pneumoniae. In their experiment, Avery et al., found out that only when DNA from S-type bacteria was added to a culture of R-type bacteria are time got converted to S-type strain.

This transformation of our into S type did not occur in addition of carbohydrate and protein from S type bacteria. Also, when DNase enzyme was added, i.e., live R-strain + DNA (S-strain) + DNase, the transformation did not occur. It proved conclusively that DNA, indeed is the genetic material.

17. (d)

18. (c)

19. (b)

20. (d)

A molecule to act as a genetic material must fulfill the following criteria

It should be able to replicate a form with carbon copies

genetic material should be able to express itself to formation of specific biochemicals

there are occasionally changes or mutation in the structure and functioning of its genes which are of permanent nature and inheritable. Mutations are essential for evolution and adaptability.

it should be able table both chemically and physically

21. (d)

The first genetic material could be RNA we know that RNA is present as a genetic material in some viruses and it also works as a catalyst. But RNA being a catalyst is reactive and hence unstable. Hence, it is considered that DNA has evolved from RNA thereby making RNA the first genetic material.

22. (d)

23. (c)

24. (d)

Meselson and Stahl found that DNA of the first generation was hybrid or intermediate (15N and 14N). It settled in caesium chloride at a level higher than the fully labelled DNA of parents bacteria (15N 15N).

Second generation of bacteria after 40 minutes contain two types of DNA, 50% light (N14 N14) and 50% intermediate (N15 N14).

The third generation of bacteria after 60 minute contained two types of DNA, 25% intermediate (N15 N14) and 75% light (N14 N14) in ratio 1:3.

It can be assumed that 4th generation after 80 minutes could would contain 12.5% N15 N14 and 87.5% N14 N14 DNA in 1:7 ratio.

Thus, if Meselson and Stahl's experiment is continued for 4th generation in bacteria, the ratio of 15N/15N : 15N/14N : 14N/14N containing DNA in the fourth generation would be 0:1:2.

25. (b)

26. (d)

Okazaki fragments are short segments of replicating DNA. These have 1000-2000 bp in prokaryotes and hundred 100-200 bp and eukaryotes. These fragments are formed discontinuously and are used to elongate the lagging strand away from the replication fork.

27. (a)

28. (b)

29. (d)

The phosphodiester nucleotide are deATP, deCTP, deTTP.

These triphosphates of base is serve dual purposes. They act as a substrate as well as provide energy for polymerization of nucleotides by releasing energy after dissociating the phosphate group.

30. (d)

The process in living cell in which genetic information of DNA is transferred to a molecule of messenger RNA is the first step in protein synthesis. This is known as transcription. It takes place in the cell nucleus of nuclear region and regulated by transcription factors .

31. (a)

32. (c)

(A) Promoter site – (V) (binding of RNA polymerase)

(B) Structural gene – (IV) (formation of functional protein)

(C) Terminal site – (I) Stopping of transcription)

(D) Template strand – (II) (Part of DNA to which RNA transcribed)

(E) Coding strand – (III) (complementary strand of DNA to RNA)

33. (a)

34. (c)

35. (b)

In mRNA of eukaryotes exons appear, but introns do not. This is because introns are intervening and non-coding sequences exams are coding and expressed sequences. Through slicing introns are removed and exons are joined to form mRNA.

36. (c)

37. (b)

38. (d)

39. (d)

40. (c)

All amino acids are specified by more than one codon (except tryptophan and methionine). Hence, they are degenerate. Since, there are 64 possible combination of the four different nucleotides in set of three, there are redundancy in the system which means that most amino acids can be coded by more than triplet.

41. (c)

42. (a)

UAA (ochre), UAG (amber) and UGA (opal) are the three codons, which bring about termination of polypeptide chain and thus, called terminator codons.

43. (b)

44. (b)

Point mutation or gene mutation involves only the replacement of one nucleotide with another or change in a single base pair of DNA.

45. (a)

Frameshift mutation of the genetic basis gives the proof that codon is triplet and reads in continuous manner. Deletion or addition of a base pay disturb the reading frame of DNA or mRNA.

46. (a)

47. (c)

48. (b)

49. (b)

50. (b)

Charging or Aminoacylation of tRNA is essential for protein synthesis, i.e. polypeptide formation through formation of peptide bonds between amino acids.

Assertion-Reason Based

Code

Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of the Assertion (A).

Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

Assertion (A) is true, but Reason (R) is false.

Assertion (A) is false, but Reason (R) is true.

1. Assertion DNA acts as a genetic material in all organisms

Reason It is a double-stranded by molecule in most organisms

2. Assertion S. pneumoniae produced two types of colonies, therefore, smooth and rough

Reason S-type bacteria from smooth colony due to the absence of polysaccharide coat

3. Assertion DNA has two chains having antiparallel polarity

Reason In one chain of DNA at one and has a free phosphate moiety 5′ end of ribose sugar and at other and the ribose has a free 3′ OH group

4. Assertion Adenine cannot pair with cytosine

Reason Adenine and cytosine do not have complementary between their respective hydrogen donor and hydrogen acceptor sites

5. Assertion Histones are basic in nature

Reason These are rich in the amino acids lysine and arginine

6. Assertion Heterochromatin is transcriptionally inactive

Reason It is densely packed

7. Assertion Viruses having RNA genome and shorter lifespan, mutate and evolve faster

Reason RNA is unstable and thus mutates faster

8. Assertion Replication on one strand of DNA is continuous and on another it is discontinuous

Reason The DNA polymerases works on direction 3'→5′ direction

9. Assertion Replication and transcription occurs in the nucleus, but translation takes place in the cytoplasm

Reason mRNA is transferred from the nucleus into cytoplasm where ribosomes and amino acids are available for protein synthesis

10. Assertion hnRNA is larger than mRNA

Reason hnRNA has non coding in terms which are not required for translation

Answer

1. (4)

DNA serves as the genetic material in must organisms, but in some viruses like TMV, RNA acts as the genetic material. DNA is a double-stranded biomolecule, but can also exist as a single-stranded biomolecule.

2. (3)

S-type bacteria form a smooth colony because they possess polysaccharide (mucus) coat around themselves, whereas R-type bacteria do not form any covering around themselves.

3. (1)

The two chains of DNA have antiparallel polarity. This is because one chain has a free phosphate moiety at the 5′ end of the ribose sugar and another chain has a free phosphate moiety at the 3′ end.

4. (1)

Adenine can't pair with cytosine. It pairs up with thymine. It is because adenine pairs with thymine with two hydrogen bonds , having two hydrogen donor / hydrogen acceptor sites whereas cytosine has three hydrogen donor. Thus, due to lack of complementary between the hydrogen donor and hydrogen acceptor sites between adenine and cytosine, these can't pair.

5. (1)

Histones are basic in nature because these are rich in amino acids lysine and arginine which are basic in nature.

6. (1)

Heterochromatin is densely packed and inaccessible to transcription factors. hence, it is rendered transcriptionally silent or inactive.

7. (1)

RNA is an unstable catalytic molecule. It mutates at a faster rate than DNA. Thus, ciruses having RNA genome and shorter lifespan, mutate and evolve faster due to this unstability.

8. (1)

9. (1)

In eukaryotes, replication ans transcription take place in the nucleus.

The fully processed hnRNA now called mRNA, is transferred from the nucleus into the cytoplasm where translation occurs.

10. (1)

The primary transcript in eukaryotes, i.e. the hnRNA is much longer as it contains both introns and exons. It is precursor of mRNA. During post-transcriptional modification. Introns, which don't code for proteins are removed and all exons are joined to form fully prossessed mRNA.

Case-Study Based

1. Read the following passage and answer accordingly.

The Meselson and Stahl experiment was an experiment to prove that DNA replication was semiconservative and i twas first shown in Escherichia coli and subsequently in higher organisms, such as plants and human cells.

Semiconservative replication means that when the double stranded DNA helix was replicated, each of the two double-stranded helices consisted of one-stranded helices consisted of one strand coming from the parental helix and one is newly synthesized.

(i) The heavy isotope used by Meselson and Stahl for proving the semiconservative mode of DNA is/are

(a) 15NH2Cl

(b) 14NH2Cl2

(c) 13NH2Cl3

(d) All of the above

(ii) Heavy DNA can be differentiated from normal DNA by which centrifugation technique?

(a) AgCl density gradient

(b) CsCl density gradient

(c) CaSO4 density gradient

(d) KCl density gradient

(iii) Similar experiments like Meselson and Stahl was performed by Taylor in 1958. The experimental organism of Taylor was

(a) Vicia faba

(b) Fungi

(c) E. coli

(d) Protista

(iv) Radioisotope used by Taylor in his experiment was

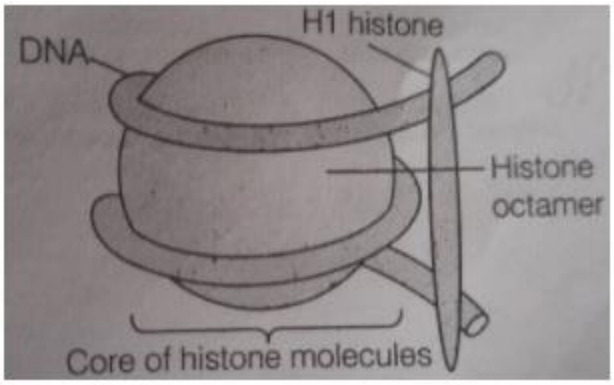
(a) iron

(b) titanium

(c) thymidine

(d) copper

2. Observe the given figure and answer accordingly.



(i) The number of nucleosomes present in human cells is

(a) 3.3 x 107

(b) 1.1 x 107

(c) 6.6 x 107

(d) Indefinite

(ii) Which amino acids are present in histones?

(a) Lysine and histadine

(b) Valine and histadine

(c) Arginine and lysine

(d) Arginine and histidine

(iii) Linker DNA is

(a) a part of nucleosome

(b) a part that joins two octamer cores

(c) ssDNA

(d) Both (a) and (b)

(iv) The association of histone H1 with a nucleosome indicates

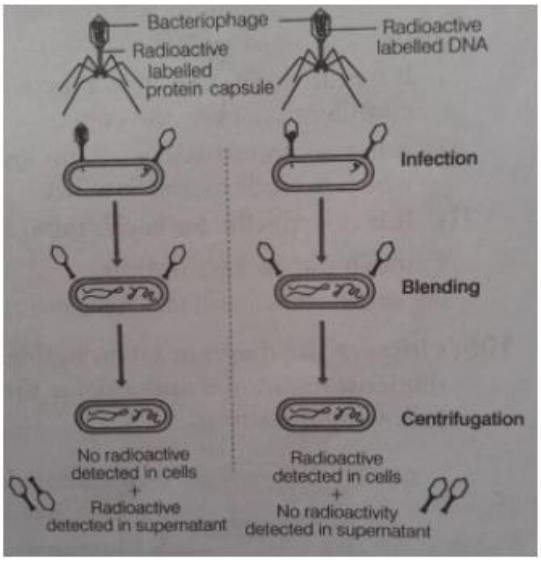
(a) transcription is occuring

(b) DNA replication is occuring

(c) the DNA is condensed into a chromatin fibre

(d) the DNA double helix is exposed

3. Observe the given figure and answer accordingly.



(i) In Hershey and Chase experiment, bacteriophage nucleic acids were labelled as

(a) 32P labelled phosphate

(b) 3H labelled H2O

(c) 35S labelled sulphate

(d) 14C labelled CO2

(ii) Bacteriophage protein coat was labelled by _____ in Hershey and Chase experiment.

(a) 35S labelled sulphur

(b) 32S labelled sulphate

(c) 30S labelled sulphur

(d) 32P labelled sulphate

(iii) In Hershey and Chase experiment, radioactive 32P was used to culture bacteriophage which resulted in radioactive

(a) viral DNA

(b) bacterial capsule

(c) viral protein

(d) plasma membrane of bacteria

(iv) DNA with labelled thymidine is added to a medium where E. coli is growing. After 5 minutes of growth

(a) all the DNA strands of parents and daughters will shoe DNA with labelled thymidine

(b) only parental strands will show thymidine labelled DNA

(c) all the strands of daughters will be thymidine labelled

(d) half the daughter strands will have labelled and half strands without labelled thymidine

Answer

1. (i)(a) (ii)(b) (iii)(a) (iv)(c)

2. (i)(a) (ii)(c) (iii)(d) (iv)(c)

3. (i)(a) (ii)(a) (iii)(a) (iv)(c)