



BIOLOGY

BOOKS - TRUEMAN BIOLOGY

NCERT Exemplar Questions +2

(MOLECULAR BASIS OF INHERITANCE)

Mcqs

1. In a DNA strand the nucleotides are linked together by :

A. glycosidic bonds

B. phosphodiester bonds

C. peptide bonds

D. hydrogen bonds

Answer: b



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2. A nucleoside differs from a nucleotide . It lacks the :

A. base

B. sugar

C. phosphate group

D. hydroxyl group

Answer: c



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3. Both deoxyribose and ribose belong to a class of sugars called :

A. trioses

B. hexoses

C. pentoses

D. polysaccharides

Answer: c



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4. The fact that a purine base always paired through hydrogen bonds with a pyrimidine base leads to , in the DNA double helix :

- A. the antiparallel nature
- B. the semiconservative nature
- C. uniform width throughout DNA
- D. uniform length in all DNA

Answer: c



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5. The net electric charge on DNA and histones is :

A. both positive

B. both negative

C. negative and positive, respectively

D. zero

Answer: c



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6. The promoter site and the terminator site for transcription are located at:

A. 3' (downstream) end and 5' (upstream) end, respectively of the transcription unit

B. 5' (upstream) end and 3' (downstream) end, respectively of the transcription unit

C. the 5' (upstream) end

D. the 3' (downstream) end

Answer: b



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7. Which of the following statements is the most appropriate for sickle cell anaemia?

A. It cannot be treated with iron supplements

B. It is a molecular disease

C. It confers resistance to acquiring malaria

D. All of the above

Answer: d



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8. One of the following is true with respect to

AUG:

- A. It codes for methionine only
- B. It is also an initiation codon
- C. It codes for methionine in both prokaryotes and eukaryotes

D. All of the above

Answer: d



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9. The first genetic material could be:

A. protein

B. carbohydrates

C. DNA

D. RNA

Answer: d



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10. With regard to mature mRNA in eukaryotes

:

A. exons and introns do not appear in the

mature RNA

B. exons and 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

Answer: b



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11. The human chromosome with the highest
and least number of genes in them are
respectively

A. chromosome 21 and Y

B. chromosome 1 and X

C. chromosome 1 and Y

D. chromosome X' and Y

Answer: c



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12. Who amongst the following scientists had no contribution in the development of the double helix model for the structure of DNA?

A. Rosalind Franklin

B. Maurice Wilkins

C. Erwin Chargaff

D. Meselson & Stahl

Answer: d



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13. DNA is a polymer of nucleotides which are linked to each other by 3-5'phosphodiester bond. To prevent polymerisation of

nucleotides, which of the following modifications would you choose?

A. Replace purine with pyrimidines

B. Remove/Replace 3' OH group in deoxy ribose

C. Remove/Replace 2' OH group with some other group in deoxy ribose

D. Both ((b) and (c)

Answer: b



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14. Discontinuous synthesis of DNA occurs in one strand, because :

A. DNA molecule being synthesised is very long

B. DNA dependent DNA polymerase catalyses polymerisation only in one direction (5' 3')

C. It is a more efficient process

D. DNA ligase has to have a role

Answer: b



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15. Which of the following steps in transcription is catalysed by RNA polymerase?

A. Initiation

B. Elongation

C. Termination

D. All of the above

Answer: b



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16. Control of gene expression takes place at the level of:

A. DNA-replication

B. Transcription

C. Translation

D. None of these

Answer: b



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17. Regulatory proteins are the accessory proteins that interact with RNA polymerase and affect its role in transcription. Which of the following statements is correct about regulatory protein?

A. They only increase expression

B. They only decrease expression

C. They interact with RNA polymerase but do not affect the expression

D. They can act both as activators and as repressors

Answer: d



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18. Which was the last human chromosome to be completely sequenced?

A. Chromosome 1

B. Chromosome 11

C. Chromosome 21

D. Chromosome x

Answer: a



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19. Which of the following are the functions of RNA?

- A. It is a carrier of genetic information from DNA to ribosomes synthesising polypeptides
- B. It carries amino acids to ribosomes
- C. It is a constituent component of ribosomes
- D. All of the above

Answer: d



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20. While analysing the DNA of an organism a total number of 5386 nucleotides were found out of which the proportion of different bases were: Adenine = 29%, Guanine = 17%, Cytosine = 32%, Thymine = 17%. Considering the Chargaff's rule it can be concluded that:

- A. it is a double stranded circular DNA
- B. it is single stranded DNA
- C. it is a double stranded linear DNA
- D. no conclusion can be drawn

Answer: b



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21. In some viruses, DNA is synthesised by using RNA as template. Such a DNA is called :

A. A-DNA

B. B-DNA

C. c DNA

D. r DNA

Answer: c



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22. If Meselson and Stahl's experiment is continued for four generations in bacteria, the ratio of $^{15}\text{N}/^{15}\text{N}$: $^{15}\text{N}/^{14}\text{N}$: $^{14}\text{N}/^{14}\text{N}$ containing DNA in the fourth generation would be:

A. 1 : 1 : 0

B. 0.0444444444444444

C. 0 : 1 : 3

D. 0:1 :7

Answer: d



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23. If the sequence of nitrogen bases of the coding strand of DNA in a transcription unit is 5'- A T GAATG - 3', the sequence of bases in its RNA transcript would be:

A. 5' -A U G A A U G-3'

B. 5' - U A C U U A C - 3'

C. 5' - C A U U C A U - 3'

D. 5' - G U A A G U A - 3'

Answer: a



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24. The RNA polymerase holoenzyme transcribes

- A. the promoter, structural gene and the terminator region
- B. the promoter, and the structural gene
- C. the structural gene and the terminator regions
- D. the structural gene only

Answer: c



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25. If the base sequence of a codon in mRNA is 5' AUG-3', the sequence of tRNA pairing with it must be:

A. 5' - UAC - 3'

B. 5' - CAU - 3'

C. 5' - AUG - 3'

D. 5' - GUA - 3'

Answer: b



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26. The amino acid attaches to the tRNA at its :

A. 5' - end

B. 3' - end

C. Anti codon site

D. DHU loop

Answer: b



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27. To initiate translation, the mRNA first binds to :

- A. the smaller ribosomal sub-unit
- B. the larger ribosomal sub-unit
- C. the whole ribosome
- D. no such specificity exists

Answer: a



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28. In E.coli, the lac operon gets switched on when :

A. Lactose is present and it binds to repressor

B. Repressor binds to operator

C. RNA polymerase binds to the operator

D. Lactose is present and it binds to RNA polymerase

Answer: a



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