

Sant Gadge Baba, Amravati University, Amravati
G.S. Science, Arts and Commerce College, Khamgaon Dist. Buldhana 444
312(M.S.)

Department of Zoology
B.Sc Part – III (Semester –VI) Summer /2020

MCQs for Theory Examination
(Part-IMolecular Biology)

1. _____ are organic molecules that have the function of starting and regulating chemical reactions.

- a) carbohydrates
- b) lipids
- c) enzymes
- d) endoplasmic reticula

2. Amino acids are the building blocks of:

- a) DNA and RNA
- b) lipids
- c) proteins
- d) carbohydrates

3. There are _____ different kinds of amino acids.

- a) 20
- b) 46
- c) 100
- d) 20,000-25,000

4. The largest molecules in our bodies are:

- a) nucleic acids
- b) chromosomes
- c) proteins
- d) amino acids

5. Which of the following statements is true?

- a) Each DNA molecule is a single gene.
- b) DNA molecules are in the shape of a double helix.
- c) mRNA molecules are in the shape of a double helix.

6. The human body is composed mostly of:

- a) calcium, iron, phosphorus, and zinc
- b) oxygen, hydrogen, calcium, and iron
- c) oxygen, nitrogen, hydrogen, and carbon

7. Which of the following statements is true about DNA?

- a) At the beginning of protein synthesis, a section of a DNA molecule unwinds and unzips.
- b) All of our DNA is normally located in the nucleus of our cells.
- c) DNA is composed of amino acids, phosphates, sugars, and bases.

8. Which of the following statements is true about the protein synthesis process?

- a) When a section of a DNA molecule unwinds and unzips along its bases, a transfer RNA forms by copying one side of the DNA.
- b) The transfer RNA leaves the nucleus and goes out to the ribosomes in the cytoplasm where proteins are assembled with the help of messenger RNA.
- c) Both statements are false

9. Which of the following occurs at the ribosomes?

- a) Most of a cell's DNA molecules are stored there.
- b) Proteins are produced there.
- c) mRNA are produced there.

10. Each tRNA anticodon has three bases. The three base combinations are codes for attracting specific kinds of:

- a) endoplasmic reticula

- b) ribosomes
- c) amino acids.

11. Which of the following statements is true about DNA replication?

- a) One DNA molecule becomes two identical ones as a result of this process.
- b) It occurs during meiosis but not mitosis.
- c) It is part of the protein synthesis process.

12. A DNA codon consists of:

- a) one nucleotide
- b) three nucleotides
- c) hundreds or even thousands of nucleotides

13. A gene is essentially a:

- a) sequence of many codons in a DNA molecule
- b) single codon in a DNA molecule
- c) chromosome

14. There are about 3 billion chemical base pairs in human DNA. Approximately what percent of these base pairs actually code for genes?

- a) 100%
- b) 30-50%
- c) 1-2%

15. Portions of DNA molecules that do not contain the codes for proteins are called:

- a) introns
- b) exons
- c) mutagens

16. Which of the following statements is true regarding the DNA code?

- a) Each of the 64 types of codons in DNA and RNA code for a different amino acid.
- b) Not all codons specify amino acid components to be included in a protein.

- c) DNA replication has a built-in mechanism that prevents or corrects all errors.

17. The DNA code is:

- a) unique to humans
 b) found only in mammals
 c) shared by all living things

18. In a nucleotide, the nitrogen base is joined to the sugar molecule by

- a) Phosphodiester bond
b) Glycosidic bond
c) Hydrogen bond
d) (a) & (b)

19. 2. If a double stranded DNA has 20% Thymine, the percentage of Guanine in the DNA

- a) 30%** b) 10% c) 90% d) 40%

20. 3. If a DNA contains 1000 base pairs, what would be its length?

- a) 3400 Å** b) 34000 Å c) 6800 d) 1000 Å

21. 4. What is not True for DNA in prokaryotes

- a) present in the form of a compact structure called nucleoli
b) the coils are maintained by non-histone basic proteins
c) found in cytoplasm in a supercoiled condition
d) packaged as nucleosomes along with histones

22. 5. Pick the right difference between a DNA and RNA

- a) Sugar and phosphate
b) sugar and purines
c) purines and phosphate
d) sugar and pyrimidines

23. 6. In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R).

(1) If both Assertion and Reason are true and the reason is the correct explanation of the assertion, then mark (a)

(2) If both Assertion and Reason are true but the reason is not the correct explanation of the assertion, then mark (b)

(3) If Assertion is true but Reason are false, then mark (c)

(4) If both Assertion and Reason are false, then mark

(d) Assertion: In Griffith's experiment mice were injected by a mixture of heat killed Smooth type bacteria and live Rough type bacteria. Some mice died of pneumonia and their blood contained both live Rough type bacteria and live Smooth type bacteria.

Reason: The dead Smooth type bacteria became alive and caused pneumonia. Griffith named it as transforming principle.

24. Hershey and Chase experiment proving DNA as the genetic material was based on the principle

- a) **Transduction** b) transformation c) transcription d) translation

25. A bacterial colony containing DNA made up of 100% N15 nitrogen bases is allowed to replicate in a medium containing N14 bases. After one round of replication the result would be

- b) All individuals will be identical to parents
- c) **All individuals will be hybrids**
- d) Only 50% individuals would be hybrids
- e) All individuals would have DNA made up of 100% N14

26. 9. Teminism is

- a. **a central dogma reverse**
- b. a central dogma of molecular biology
- c. a circular flow of hereditary material
- d. an effect of cytoplasm on functioning of DNA

27. 10. Cistron is

- a. The coding sequence of DNA
- b. **The functional unit of DNA molecule that codes for a particular gene product**
- c. Intervening non coding sequence of DNA
- d. The sequences which are removed during RNA splicing.

28. 11. Read the statements given below and identify the incorrect statement.

- a. The human genome contains 3164.7 million nucleotide bases.
- b. The average gene consists of 30,000 bp
- c. The total number of genes is estimated at 30,000.
- d. Chromosome Y has 231 genes
- e. Less than 2% of the genome codes for proteins.

29. 12. The coding sequences found in split genes are called

- a. Operons
- b. introns
- c. **exons**
- d. cistrons

30. 13. The removal of which enzyme affects the synthesis of hnRNA in eukaryotes

- a. **RNA polymerase II**
- b. RNA primase
- c. RNA polymerase III
- d. RNA polymerase I

31. 14. Sickle cell anemia is caused
- When valine is replaced by glutamic acid in beta polypeptide chain
 - When glutamic acid is replaced by valine in beta polypeptide chain**
 - When glutamic acid is replaced by valine in alpha polypeptide chain
 - When valine is replaced by glutamic acid in alpha polypeptide chain
32. 15. Wobble position means
- Base pairing
 - altered base on code**
 - third altered base on codon
 - none of the above
33. 16. Peptidyl transferase
- Is a 23s rRNA
 - forms peptide bonds
 - component of ribosome
 - all the three**
34. 17. Which mRNA will be translated to a polypeptide chain containing 8 amino acids?
- AUGUAAUAGACGAGUAGCGACGAUGU
 - AUGAGACGGACUGCAUUCCCAACCUGA**
 - AUGCCCAACCGUUAUUCAUGCUAG
 - AUGUCGACAGUCUAAAACAGCGGG
35. 18. Arrange the following events in the order of synthesis of a protein
36. A peptide bond forms
37. ii) A tRNA matches its anticodon to the codon in the A- site
38. iii) The movement of second tRNA complex from A-site to P-site
39. iv) The large subunit attaches to the small subunit and the initiator tRNA fits in the P-site
40. v) A small subunit binds to the mRNA
41. vi) The activated amino acid tRNA complex attaches the initiation codon on mRNA
- iv, v, iii, ii, i, vi
 - iv, vi, v, ii, I, iii
 - v, iv, iii, ii, vi, I
 - v, vi, iv, ii, i, iii**
42. 19. Select the incorrect statement out of the five given below about lac operon when Lactose is present in the medium.
- Gene – A gets transcribed into mRNA which produces β -galactoside permease**
 - Inducer-Repressor complex is formed
 - Lactose inactivates repressor protein
 - RNA polymerase transcribe Z-gene, Y-gene and A-gene
 - Allolactose is the inducer of lac operon
43. 20. The percentage of human genome which encodes proteins is approximately

- a. Less than 2%
 - b. 5%
 - c. 25%
 - d. 99%
44. Q 21. Enzyme which can break and seal the DNA strand
- a. Topoisomerase II
45. (b) Helicase
46. (c) Primase
47. (d) Restriction endonuclease
48. 22. Which of the statements give below is correct with respect to frameshift mutation
- a. a single nucleotide base change, insertion, or deletion of the genetic material
 - b. Glutamine is replaced by valine
 - c. Sickle cell anemia is an example
 - d. insertions or deletions of a number of nucleotides in a DNA sequence that is not divisible by three.
49. The transcription initiation factor associated with the RNA polymerase holoenzyme in prokaryotes is
- a. β
 - b. ω
 - c. σ
 - d. αI
50. The stretch of codons between AUG and a stop codon is called
- i. open reading frame
 - ii. TATA box
 - iii. colinearity
 - iv. degenerate
51. The structural genes of lac operon transcribe mRNA which is
- i. polycistronic
 - ii. replicative
 - iii. monokaryotic
 - iv. monocistronic
52. If the sequence of bases in DNA is TACCGACCA, then the sequence of codons on the transcript will be
- i. ATGGCTGGT
 - ii. ATCCGAACU
 - iii. AUGGCUGGU
 - iv. AUGGACUAA

Note: Answers are shown in red ink
