

Yashwantrao Chavan College of Science, Karad.

B.Sc. Part III Semester-V

**Paper- X (Molecular cell biology and animal biotechnology)
Question Bank**

Multiple choice questions

1. What is the function of enzyme involved in base excision repair?
 - a) Addition of correct base
 - b) Addition of correct nucleotide
 - c) Removal of incorrect base
 - d) Removal of phosphodiester bond
2. Why recombinational repair system is called double strand break repair?
 - a) Both strands are broken
 - b) One strand is broken
 - c) No strand is broken
 - d) Both strand act as template
3. In SOS repair system cleavage of LexA and UmuD is mediated by _____
 - a) RecB
 - b) RecA
 - c) RecC
 - d) UvrA
4. What is a mode of replication in E.coli?
 - a) Intermediate
 - b) Dispersive
 - c) Conservative
 - d) Semiconservative
5. What is the origin of replication?
 - a) Particular site at which DNA replication starts

- b) Site which prevents initiation
 - c) Random location on the DNA
 - d) Site at which replication terminated
6. Which of the following has the self-repairing mechanisms?
- a) DNA and RNA
 - b) DNA, RNA and protein
 - c) Only DNA
 - d) DNA and proteins
7. The okazaki fragments are present onstrand
- a.)Template b)leading c)lagging d)all the above
8. Replication occurs in...phase
- a)G1 b)S c)G2 d)M.
9. In replication of DNA synthesis of new strand always occurs in the direction
- a) 5' - 3' b)3' -5' c)both forward d) both backward.
10. DNA polymeraseremoves RNA primer and replaces DNA
- a)I b)II c)III d)IV.
11. The genetic code is _____
- a) Triplet b) Quadruplet c) Doublet d) Singlet
12. 18. A codon contains how many nucleotides?
- a) 1
 - b) 2
 - c) 3
 - d) 4
13. 19. The initiation codon is _____
- a) AUG
 - b) UAA
 - c) UAG
 - d) UGA
14. What is the reaction in DNA replication catalyzed by DNA ligase?
- a) Addition of new nucleotides to the leading strand
 - b) Addition of new nucleotide to the lagging strand

- c) Formation of a phosphodiester bond between the 3'-OH of one Okazaki fragment and the 5'-phosphate of the next on the lagging strand
 - d) Base pairing of the template and the newly formed DNA strand
15. Which of the following enzymes remove supercoiling in replicating DNA ahead of the replication fork?
- a) DNA polymerases
 - b) Helicases
 - c) Primases
 - d) Topoisomerases
16. DNA unwinding is done by _____
- a) Ligase
 - b) Helicase
 - c) Topoisomerase
 - d) Hexonuclease
17. What is the work of the sigma factor in transcription?
- a) Helicase action
 - b) Transcription initiation
 - c) Transcription elongation
 - d) Transcription termination
18. factor is used for promoter recognition
- a) Sigma 32
 - b) Sigma 70
 - c) Sigma 60
 - d) Sigma 40
19. base pairs of DNA is transcribed by RNA polymerase in one go.
- a) 5-6
 - b) 3
 - c) 4
 - d) 7-8
20. The termination codon is not _____
- a) AUG

- b) UAA
 - c) UAG
 - d) UGA
21. 21. How many t-RNAs are required to translate all 61 codons?
- a) 31
 - b) 32
 - c) 30
 - d) 29
22.is the energy rich molecule requires for initiation of translation
- a)ATP b)GTP c)CTP d)AMP
23. The 70S ribosome has.....binding sites of aminoacyl RNA
- a)A site b)P site c)E site d)all the above
24. . Which of the following transcription termination technique has RNA dependent ATPase activity?
- a) Intercalating agents
 - b) Rho dependent
 - c) Rho independent
 - d) Rifampicin
25. Shine-Dalgarno sequence is present in the _____
- a) hnRNA
 - b) mRNA
 - c) tRNA
 - d) siRNA
26. The first amino acid incorporated at the N-terminus of polypeptide is
- a) methionine
 - b) cysteine
 - c) tryptophan
 - d) valine.

27. The genetic code translated the language of _____
- a) Proteins into that of RNA
 - b) Amino acids into that of RNA
 - c) RNA into that of proteins
 - d) RNA into that of DNA
28. Wobble hypothesis was first proposed by _____
- a) Nirenberg
 - b) Watson and Crick
 - c) Watson
 - d) Crick
29. Synthesis of RNA from DNA template is called
- a) Transcription b) Translation c) Transition d) none of the above
30. Methionine is specified by initiation codon _____ to begin polypeptide chain synthesis.
- a) AUG b) UGA c) AAA d) AGU
31. Simple proteins are polymers of _____
- a) Sugars b) Amino Acids c) Fatty acids d) Globular proteins
32. Who discovered RNA polymerase?
- a) Samuel B. Weiss
 - b) Nirenberg
 - c) Watson and Crick
 - d) Darwin
33. Which of the following ensure stable binding of RNA polymerase at the promoter site?
- a) DNA photolyase
 - b) Sigma factor
 - c) DNA glycosylase
 - d) RecA
34. . Lac operon will be turned on when.....
- a) Lactose is less than glucose
 - b) Lactose is less than medium

- c) Glucose is enough in the medium
 - d) Lactose is more than glucose
35. Lac operon is an example of.....
- a) Only positive regulation
 - b) Only negative regulation
 - c) both positive and negative regulation regulation
 - d) sometimes positive sometime negative
36. Which is INCORRECT statement about the transcription unit?
- a) It is a transcribed segment of DNA
 - b) Eukaryotes have monocistronic transcription unit
 - c) Prokaryotes also have a monocistronic transcription unit
 - d) Immediate product of transcription is primary transcript
37. Which of the following is TRUE for the RNA polymerase activity?
- a) DNA dependent DNA synthesis
 - b) Direct repair
 - c) DNA dependent RNA synthesis
 - d) RNA dependent RNA synthesis
38. Which enzyme used to join bits of DNA?
- a) DNA polymerase
 - b) DNA ligase
 - c) Endonuclease
 - d) Primase
39. Southern blotting is
- a) Attachment of probes to DNA fragments
 - b) Transfer of DNA fragments from electrophoretic gel to a nitrocellulose sheet
 - c) Comparison of DNA fragments to two sources
 - d) Transfer of DNA fragments to electrophoretic gel from cellulose membrane
40. 7. The polymerase chain reaction is_____.
- a) It is a DNA sequencing technique. b) It is a DNA degradation technique
 - b) It is a DNA amplification technique d) All of the above

41. Denaturation is the process of _____.
- a) Heating between 72°C
 - b) Heating between 40 to 60°C
 - c) Heating between 90 to 98°C
 - d) None of the above
42. Restriction endonuclease produce.....cuts.
- a) External
 - b) internal
 - c) internal and external
 - d) at one end
43. Cloning vector are DNA molecules that can carry
- a) Foreign DNA fragment
 - b) Chromosome
 - c) Foreign protein
 - d) Enzyme
44. Select the wrong statement about plasmids?
- a) It is extrachromosomal
 - b) It is double stranded
 - c) Its replication depends upon host cell
 - d) It is closed and circular DNA
45. During replication, Okazaki fragments elongate
- (a) leading strand towards the replication fork
 - (b) lagging strand towards the replication fork
 - (c) leading strand away from the replication fork
 - (d) lagging strand away from the replication fork
46. Which position of a codon is said to wobble?
- a) First
 - b) Second
 - c) Third
 - d) Fourth
47. . Which of the following enzymes is the principal replication enzyme in E. coli?
- a) DNA polymerase I
 - b) DNA polymerase II
 - c) DNA polymerase III
 - d) None of the mentioned
48. Individual amino acid during protein synthesis specified bycodons.
- a) 3
 - b) 20
 - c) 64
 - d) 61
49. Translation is the
- a) Synthesis of protein from a mRNA
 - b) Synthesis of DNA from a mRNA
 - c) Synthesis of RNA from a mRNA
 - d) Synthesis of protein from a DNA

50. The process of formation of RNA is known as _____
- a) Replication
 - b) DNA repair
 - c) Translation
 - d) Transcription
51. The enzyme required for transcription is _____
- a) Restriction enzyme b) DNA polymerase
 - c) RNA polymerase d) RNAase
52. _____ is a process in which RNA is synthesized from DNA template.
- a) Transcription b) Translation c) Transition d) Transformation
53. Translation is the.....
- a) Synthesis of DNA from a mRNA template
 - b) Synthesis of protein from a mRNA template
 - c) Synthesis of RNA from a mRNA template
 - d) Synthesis of RNA from a DNA template

Long answer questions

1. What is lac operon? Explain it in detail with all its components.
2. What is DNA repair? Explain the DNA mismatch repair.
3. Explain in detail construction of cDNA libraries.
4. Write an account on transcription process in eukaryotes.
5. What is DNA transformation? Describe the methods of DNA transformation.
6. Describe Western blotting techniques? Add a note on their significance.
7. What is polymerase chain reaction? Explain in detail.
8. What is DNA replication? Explain the mechanism of semiconservative mode.
9. What is DNA damage? Describe types of DNA damage.
10. What is DNA sequencing? Explain in detail Sanger's method.
11. What is DNA Fingerprinting? Write its principle, procedure and application.
12. Relate protein synthesis and its two major phases to the central dogma of molecular biology.
13. Define restriction enzymes and give its classification in detail?

14. What is DNA repair? Describe base excision & nucleotide excision repair mechanisms.
15. What is genetic code? Explain the properties of Genetic code.

Short answer questions

- Nomenclature and classification of restriction enzymes
- Codon Assignment
- Post transcriptional modification in RNA.
- Phagemids
- Northern Blotting.
- Southern blotting
- Wobble Hypothesis
- DNA Microarray
- Plasmid as a cloning vector
- Genomic libraries
- Genetic code is non-overlapping and non-ambiguous.
- Transamination.
- Calcium Chloride method of DNA Transformation

- Base pair excision repair mechanism
- RNA polymerase in prokaryotes
- Photoreactivation repair mechanism
- Lac operon
- cDNA libraries
- Application of Polymerase chain reaction
- pBR322
- Electroporation method of transformation techniques
- Lambda bacteriophage cloning vector
- Causes of DNA damage

- Nucleotide excision repair

- Southern blotting
- Okazaki fragments
- Cosmid as a cloning vector

Seat No.	
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B.Sc. (Part - III) (Semester - V) Examination, November - 2018

ZOOLOGY

Molecular Biology, Biotechnology & Biotechniques

(Paper - XI)

Sub. Code: 65850

Day and Date : Wednesday, 14 - 11 - 2018

Total Marks : 40

Time : 12.00 p.m. to 2.00 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Draw neat and labelled diagrams wherever necessary.
 - 3) Figures to the right indicate full marks.

Q1) Select correct answer from the following and rewrite the sentences. [8]

- a) The process of formation of new DNA strands from old DNA strands is called as _____.
 - i) Translation
 - ii) Replication
 - iii) Transformation
 - iv) Transcription
- b) The initiation codon AUG in prokaryotes codes for _____.
 - i) Valine
 - ii) Formyl methionine
 - iii) Phenyl alanine
 - iv) Tyrosine
- c) Translation is the _____.
 - i) Synthesis of pretein from a mRNA
 - ii) Synthesis of DNA from a mRNA
 - iii) Synthesis of RNA from a mRNA
 - iv) Synthesis of protein from a DNA.
- d) The enzyme required for transcription is _____.
 - i) Restriction enzyme
 - ii) DNA polymerase
 - iii) RNA polymerase
 - iv) RNAase
- e) The technique used for invitro amplification of DNA fragments of specific sizes is _____ technique.
 - i) ELISA
 - ii) Chromatography
 - iii) Electrophorasis
 - iv) Polymerase chain reaction (PCR)

P.T.O.

- f) Southern blotting is the technique used for _____ blot.
- | | |
|------------|-----------|
| i) Protein | ii) DNA |
| iii) RNA | iv) Lipid |
- g) For cloning to occur, bacteria's plasmids must be cut by _____.
- | | |
|------------------------|------------------------|
| i) restriction enzymes | ii) polymerase enzymes |
| iii) helicase enzymes | iv) gyrase enzymes |
- h) _____ is the termination codon.
- | | |
|----------|---------|
| i) AUG | ii) GUG |
| iii) UCC | iv) UAG |

Q2) Attempt any two of the following: [16]

- What is polymerase chain reaction? Describe steps involved in polymerase chain reaction (PCR).
- What is DNA replication? Explain mechanism of semiconservative mode of replication.
- Describe operon hypothesis, regulating lactose metabolism pathway in prokaryotes.

Q3) Attempt any four of the following: [16]

- RNA polymerase in prokaryotes.
- Initiation and termination codons.
- Southern blotting.
- Stem cells and their applications.
- Gel Electrophoresis.
- DNA fingerprinting

