TELANGANA UNIVERSITY
S.S.R. DEGREE COLLEGE, NIZAMABAD (C.C:5029)
II SEMESTER INTERNAL ASSESSMENT-II EXAMINATIONS
DEPARTMENT OF BIO TECHNOLOGY
(MOLECULAR BIOLOGY) QUESTION BANK

1.What is a mode of replication in E.coli?
a) Intermediate
b) Dispersive
c) Conservative
d) Semiconservative

2.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

3.Which of the following protein does not involve in the initiation of replication?
a) DnaA
b) SSB (Single strand binding protein)
c) DnaB
d) DnaF

4.Which of the following protein is required for connecting Okazaki fragments?
a) Scaffold protein
b) Helicase
c) Primase
d) DNA gyrase

5.Name the protein, which is responsible for the formation of RNA primer?
a) Topoisomerase
b) Gyrase

c) Helicase
d) Primase

6.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

7.Which of the following enzymes separates the two strands of DNA during replication?
(a) Gyrase
(b) Topoisomerase
(c) Helicase
(d) DNA polymerase

8.Which of the following helps in opening of DNA double helix in front of replication fork?
(a) topoisomerase
(b) DNA polymerase-I
(c) DNA gyrase
(d) DNA ligase

9.Termination of replication is triggered by
(a) DNA polymerase
(b) Helicase
(c) SSB
(d) Tus protein

10.The fragments of DNA are joined together by which of the following enzymes?
(a) Endonuclease
(b) DNA polymerase
(c) Primase
(d) Ligase

11.Which type of E.coli strain was chosen to prove the experiment of conjugation?
a) prototrophs
b) auxotrophs
c) polyauxotrophs
d) autotrophs
12.The Hfr chromosome is transferred to the F— cell in a _____ fashion.
a) circular
b) coiled
c) dimer
d) linear

13.Which of the following can be used as a measure to construct a linkage map of the Hfr chromosome?
a) frequency of recombination
b) time of entry
c) locus of mutation
d) transfer of F factor

14.This virus is used for transduction
(a) Lambda phage
(b) T7 phage
(c) T4 phage
(d) T2 phage

15.This is the role undertaken by bacteriophage in transduction
(a) episome
(b) recipient
(c) donor
(d) vector

16.What is the full form of TALEN?

A) Transcription Activator-Like Effector Nuclease
B) Transcription Associated Ligase Enzyme Nuclease
C) Transcription Activator-Linked Enzyme Nuclease

D) Transcription Activator-Like Endonuclease

17.Which of the following systems uses a guide RNA to target specific DNA sequences?
A) Zinc Finger Nucleases
B) CRISPR-Cas9
C) TALENs
D) RNAi

18.The CRISPR-Cas9 system was originally discovered in which organism?
A) Virus
B) Bacteria
C) Fungi
D) Plants

19.What role does the Cas9 protein play in the CRISPR system?
A) RNA synthesis
B) DNA repair
C) DNA cleavage
D) Transcription regulation

20.In TALENs, the DNA-binding domain is composed of which repeating unit?
A) Zinc fingers
B) Leucine zippers
C) TALE repeats
D) RNA motifs

21.Which component of CRISPR-Cas9 ensures the system targets the correct DNA sequence?
A) Cas9 enzyme
B) Promoter
C) Guide RNA (gRNA)
D) Plasmid vector

22.The PAM (Protospacer Adjacent Motif) sequence is essential for which genome editing technology?
A) TALENs
B) CRISPR-Cas9
C) RNAi
D) None of the above

23.What is the primary use of both TALENs and CRISPR-Cas9?
A) Gene expression profiling
B) DNA sequencing
C) Genome editing
D) Protein synthesis

24.Which of the following is NOT a type of DNA damage?
A) Double-strand breaks
B) Base modification
C) RNA splicing
D) Pyrimidine dimers

25.Ultraviolet (UV) radiation commonly causes which type of DNA lesion?
A) Deamination
B) Pyrimidine dimers
C) Double-strand breaks
D) DNA crosslinking

26.Which of the following chemicals is known to cause alkylation of DNA?
A) Benzene
B) Formaldehyde
C) Ethyl methanesulfonate (EMS)
D) Hydrogen peroxide

27.Which enzyme is primarily involved in repairing UV-induced DNA damage?
A) DNA polymerase I
B) Photolyase
C) Topoisomerase

D) Telomerase

28.Which type of mutation involves a single nucleotide change?
A) Frame shift
B) Chromosomal deletion
C) Point mutation
D) Gene duplication

29.Ionizing radiation (e.g., X-rays, gamma rays) primarily causes:
A) Base substitutions
B) DNA double-strand breaks
C) Silent mutations
D) Frameshift errors

30.A chemical that intercalates between DNA bases and causes frameshift mutations is:
A) Caffeine
B) Ethidium bromide
C) Sodium chloride
D) Riboflavin

31.What type of mutation is caused by spontaneous deamination of cytosine?
A) Cytosine to guanine
B) Cytosine to uracil
C) Adenine to cytosine
D) Guanine to thymine

32.Chemical mutagens that mimic nucleotide bases are called:
A) Base analogs
B) Alkylating agents
C) Intercalating agents
D) Crosslinkers

33.Which DNA repair mechanism is used to correct thymine dimers in humans?
A) Base excision repair

B) Nucleotide excision repair
C) Homologous recombination
D) Mismatch repair

34.Transcription is the process of synthesizing:
A) DNA from RNA
B) RNA from DNA
C) Protein from RNA
D) Protein from DNA

35.Which enzyme is responsible for transcription in eukaryotes?
A) DNA polymerase
B) RNA polymerase II
C) RNA polymerase I
D) Ligase

36.The start codon for translation is:
A) UGA
B) UAA
C) AUG
D) UAG

37.In eukaryotes, transcription occurs in the:
A) Ribosomes
B) Cytoplasm
C) Nucleus
D) Mitochondria only

38.Which molecule carries amino acids to the ribosome during translation?
A) rRNA
B) mRNA
C) tRNA
D) snRNA

39.The process of removing introns from pre-mRNA is called:

A) Capping
B) Polyadenylation
C) Splicing
D) Editing

40.In prokaryotes, transcription and translation are:
A) Separated by nuclear membrane
B) Unrelated processes
C) Coupled and occur simultaneously
D) Inactive during cell division