Chapter 5
Molecular Biology and Genetics

1. Enzymes involved in base excision repair are
(A) DNA glycosylase and AP endonuclease.
(B) DNA polymerase and Flap endonuclease.
(C) Flap endonuclease and AP exonuclease.
(D) AP exonuclease and AP endonuclease.

2. Which of the following genes are involved in mismatched repair system in bacteria?
(A) MutS, MutH
(B) UvrD and MutA
(C) MutL and UvrD
(D) MutD and MutL

3. The RNA-induced silencing complex (RISC) contains which of the following proteins
(A) dsRNA binding protein
(B) RNA helices
(C) Protein kinase RNA activator (PACT)
(D) Transactivation response RNA binding protein (TRBP)

4. Which of the following are the role of non-coding DNA in the cell
(A) Provide structural support to chromosomes
(B) Work as functional RNA for transcription
(C) Each time a cell divides, non-coding DNA slightly shortened the DNA at the ends of chromosome
(D) Provide protective cap for chromosome through telomeres

5. Huntington Disease refers to:
(A) a nucleic acid repeat consisting of: C– A– G.
(B) damage of Brain cells.
(C) located in short arm of chromosome 4.
(D) autosomal recessive inheritance.

6. True statement about transposase restriction mechanism and transposable elements are of the IS element restricts the transposon and the target DNA in a combination of which of the following?
(A) The target DNA of transposase restriction mechanism is a combination blunt end cut for transposon and sticky end cut for target DNA.
(B) The cut and paste TEs duplicate itself during the transposition in S phase.
(C) Transposition mechanism of class II TEs involve an RNA intermediate.
(D) Retrotransposons are similar to the retroviruses with long terminal repeats (LTRs).

7. Which of the following functions are performed by transposase?
(A) Restriction of the IS element
(B) Integration of the transposon
(C) Formation of the RNA intermediate

(D) Restriction of the host genome

8. Which of the following are part of the minor splicosome machinery?

(A) U2 SnRNA **(B)** U4atac

(C) U5 SnRNA **(D)** U6atc

9. Which of the following statement are true regarding linkage group?

(A) Group of physically linked genes

(B) Represent a haploid number of chromosomes

(C) Shown by linkage map

(D) Linkage groups are not correlated with each other

10. Which of the following are sex-linked diseases?

(A) Hemophilia **(B)** Hepatitis

(C) Malignancy **(D)** Color blindness

11. In a large wildflower population, assume that no new mutations occur, and that no natural selection operates. What factor(s) will affect the frequency of a genotype in this population?

(A) Non-random mating

(B) Gene flow

(C) Out-breeding within the population

(D) Invasion of a new pathogen that kills a large number of individuals in the population

12. Which of the following is(are) INCORRECT in the regulation of the *trp* operon?

(A) It is an example of a negatively controlled repressible operon.

(B) The amino acid Trp inactivates the repressor.

(C) The amino acid Trp induces the operon.

(D) The repressor binds to the operator in the presence of amino acid Trp.

13. In a double stranded DNA, which of the following ratios is/are always equal to 1? A, T, G and C denote the number of bases.

(A) (A+T)/(G+C) **(B)** (A+G)/(T+C)

(C) A/G **(D)** (G+T)/(A+C)

14. DNA and RNA are acidic in nature due to the presence of

(A) pentose sugar. **(B)** nitrogenous bases.

(C) phosphate groups. **(D)** large number of hydrogen bonds.

15. Pick the correct statement(s) with respect to the inter-conversion of the topoisomers of a circularly closed double stranded DNA.

(A) Only one strand needs to be cut.

(B) Both strands have to be cut.

(C) No strand needs to be cut.

(D) ATP is required for inter-conversion.

Answer Key

1. (A), (B)

2. (A), (C)

3. (A), (C), (D)
4. (A), (B), (D)
5. (A), (B), (C)
6. (A), (B), (D)
7. (A), (B), (D)
8. (B), (C), (D)
9. (A), (B), (C)
10. (A), (D)
11. (A), (B), (C), (D)
12. (B), (C)
13. (B), (D)
14. (C)
15. (A), (B), (D)