(p.317) **47.** What is always the first amino acid in the new polypeptide? Methionine

(p.319) **48.** What are polyribosome and what advantage do they serve? [**Figure 17.20**]

Polyribosomes are a string of ribosomes translating the same mRNA. Polyribosomes help to speed up protein synthesis.

(p.320) **49.** How are proteins targeted for the ER.

Proteins targeted for the ER are marked with a *signal peptide*.

(p.322) **50.** Define a mutation in terms of molecular genetics.

Mutations are changes in the genetic material of a cell.

(p.322) **51.** Define point mutations.

Point mutations are chemical changes in just one base pair of a gene.

(p.323) **52.** What are frameshift mutations?

Frameshift mutation occur whenever the number of nucleotides inserted or deleted is not a multiple of three resulting in all nucleotides *downstream* will be improperly into codons usually resulting in premature termination.

(p.323) **53.** Identify two mechanisms by which frameshifts may occur.

Two mechanisms by which frameshifts may occur are insertions and deletions.

(p.322) **54.** What is the difference between a nonsense and missense mutation?

Nonsense mutations are substitution mutations that changes a codon for an amino acid to a STOP codon prematurely termination translation and resulting in a much shorter polypeptide (protein). Missense mutations are substitution mutations that still code for an amino acid and thus make sense.

(p.322) **55.** How can a base-pair substitution result in a silent mutation?

A base-pair substitution results in a silent mutation when they have no effect on the encoded protein due to the redundancy of the genetic code.

(p.323) **56.** What are mutagens?

Mutagens are physical and chemical agents that cause mutations.

(p.325) **57.** What are carcinogens?

Carcinogens are cancer-causing chemicals.

(p.325) **58.** Explain the statement, "Most carcinogens are mutagens and most mutagens are carcinogens."

Finally, use this summary figure to put together all that you have learned in this chapter.