01) Which of the following statements is not true regarding the active site of an enzyme?

a. An active site is normally on the surface of an enzyme.
b. An active site is normally hydrophobic in nature.
c. Substrates fit into active sites and bind to functional groups within the active site.
d. An active site contains amino acids which are important to the binding process and the catalytic mechanism.

02) Some enzymes have a binding site which is not recognised by the normal substrate, and affects the activity of the enzyme if it is occupied by a ligand. What term is used for such a binding site?

a. Active site.
b. Allosteric binding site.
c. Secondary binding site.
d. Inhibitory binding site.

03) What term is used to describe the binding site of an enzyme where a reaction is catalysed?

a. Active site.
b. Allosteric binding site.
c. Secondary binding site.
d. Inhibitory binding site.

04) Which of the following terms refers to the process by which a substrate binds to an active site and alters the shape of that active site?

a. Moulded fit.
b. Intermolecular bonding.
c. Induced fit.
d. Lock and key theory.

05) Identify which of the amino acids; glutamate, phenylalanine, threonine, and serine, would use the following interactions in an active site; hydrogen bonding, ionic bonding, van der Waals interactions, H-bonding, and van der Waals interactions.

a. Hydrogen bonding
b. Ionic bonding
c. Van der Waals interactions
d. Hydrogen bonding and van der Waals bonding

06) Which of the following descriptions best describes a cofactor?

Terms: cofactor, co-enzyme, prosthetic group, substrate

a. A non-protein substance that is required by an enzyme if it is to catalyse a reaction.
b. A non-protein organic molecule that is required by some enzymes in order to catalyse a reaction on a substrate.
c. A non-protein organic molecule that is bound covalently to the active site of an enzyme, and which is required if the enzyme is to catalyse a reaction on a substrate.
d. A compound which is bound to the active site and undergoes a reaction.
07) Which of the following descriptions best describes a coenzyme?
   a. A non-protein substance that is required by an enzyme if it is to catalyse a reaction.
   b. A non-protein organic molecule that is required by some enzymes in order to catalyse a reaction on a substrate.
   c. A non-protein organic molecule that is bound covalently to the active site of an enzyme, and which is required if the enzyme is to catalyse a reaction on a substrate.
   d. A compound which is bound to the active site and undergoes a reaction.

08) Which of the following descriptions best describes a prosthetic group?
   a. A non-protein substance that is required by an enzyme if it is to catalyse a reaction.
   b. A non-protein organic molecule that is required by some enzymes in order to catalyse a reaction on a substrate.
   c. A non-protein organic molecule that is bound covalently to the active site of an enzyme, and which is required if the enzyme is to catalyse a reaction on a substrate.
   d. A compound which is bound to the active site and undergoes a reaction.

09) Which of the following descriptions best describes a substrate?
   a. A non-protein substance that is required by an enzyme if it is to catalyse a reaction.
   b. A non-protein organic molecule that is required by some enzymes in order to catalyse a reaction on a substrate.
   c. A non-protein organic molecule that is bound covalently to the active site of an enzyme, and which is required if the enzyme is to catalyse a reaction on a substrate.
   d. A compound which is bound to the active site and undergoes a reaction.

10) Consider the following enzyme-catalysed reaction carried out on glycogen. What is the product?

   ![Reaction Diagram]

   a. Glucose-1-phosphate.
   b. Adrenaline.
   c. Glucose.
   d. AMP.

11) Consider the following enzyme catalysed reaction. What is the substrate?

   ![Reaction Diagram]

   a. Glucose-1-phosphate.
   b. Phosphorylase $\alpha$.
   c. Glycogen.
   d. AMP.
12) Consider the following enzyme-catalysed reaction. What is the enzyme?

\[ \text{Glycogen} \xrightarrow{\text{Phosphorylase}} \text{Glucose-1-phosphate} \]

a. Glucose-1-phosphate.
b. Phosphorylase.
c. Glycogen.
d. AMP.

13) Consider the following enzyme-catalysed reaction. What is the enzyme modulator that activates the enzyme?

\[ \text{Glycogen} \xrightarrow{\text{Phosphorylase}} \text{Glucose-1-phosphate} \]

a. Glucose-1-phosphate.
b. Phosphorylase.
c. Glycogen.
d. AMP.

14) Consider the following enzyme-catalysed reaction. What sort of enzyme is involved?

\[ \text{Glycogen} \xrightarrow{\text{Enzyme}} \text{Glucose-1-phosphate} \]

a. Esterase.
b. Phosphorylase.
c. Ligase.
d. Transferase.
15) Consider the following enzyme-catalysed reaction. What chemical messenger triggers a cascade of cellular event that eventually activates the enzyme involved in this reaction?

![Enzyme-catalysed reaction diagram](image)

a. Acetylcholine.
b. Noradrenaline.
c. Serotonin.
d. Adrenaline.

16) Identify A-D in the following reaction. (p. 38)

![Reaction diagram](image)

a. A
b. B
c. C
d. D

17) Identify A-D in the following diagram. (p 38)

![Diagram](image)

a. A
b. B
c. C
d. D
18) Which of the following statements is not true regarding the active site of an enzyme?
a. An active site is normally a hollow or cleft on the surface of an enzyme.
b. An active site is normally hydrophilic in nature.
c. Substrates fit into active sites and bind to functional groups within the active site.
d. An active site contains amino acids which are important to the binding process and the catalytic mechanism.

19) Which of the following amino acids commonly acts as a nucleophilic group in enzyme-catalysed reaction mechanisms?
a. Serine.
b. Phenylalanine.
c. Histidine.
d. Valine.

20) Which of the following amino acids acts as a nucleophilic group in enzyme-catalysed reaction mechanisms?
a. Threonine.
b. Tyrosine.
c. Cysteine.
d. Glutamine.

21) Which of the following amino acids acts as an acid-base catalyst in enzyme-catalysed reaction mechanisms?
a. Serine.
b. Phenylalanine.
c. Histidine.
d. Tryptophan.

22) From which amino acid is nitrous oxide generated?
a. Arginine.
b. Aspartic acid.
c. Asparagine.
d. Lysine.

23) What term is used for enzymes such as COX-1 and COX-2 which vary in structure and location but which catalyse the same reaction?
a. Isosteres.
b. Isozymes.
c. Isotopes.
d. Isomers.

24) Which of the following statements is true with respect to the Michaelis constant?
a. It is equal to the concentration of substrate at which the reaction rate is half of its maximum value.
b. It is equal to the concentration of inhibitor at which the reaction rate is half of its maximum value.
c. It is equal to the concentration of substrate at which the reaction rate is at its maximum value.
d. It is equal to the concentration of inhibitor at which the reaction rate is zero.