**1) An alive animal cell in a hypotonic solution will ----------**

a- Lose water and shrink
b- Gain water and rupture
c- Gain or lose water depending on temperature
d- Stay normal

**2) Which of the following statements is true about passive transport?**

a- Solute molecules move against their concentration gradient
c- It requires specific transport proteins in the membrane
b- It requires energy
d- Solute molecules move down their concentration gradient

**3) The peripheral membrane protein is characterized as----------**

a- Hydrophilic
b- Hydrophobic
c- Amphipathic
d- Halophilic

**4) Which of the following molecules pass through the cell membrane most easily?**

a- Large and hydrophobic
b- Small and hydrophobic
c- Large and hydrophilic
d- Small and hydrophilic

**5) Which of the following statements is NOT true for active transport?**

a- Allows cell to maintain its internal concentrations of small molecules
c- Moves solutes down their concentration gradient
b- Requires metabolic energy
d- Performed by transport proteins

**6) Which of the following diffuses most rapidly through the plasma membrane?**

a- Glucose
b- H2O
c- O2
d- Na+

**7) White blood cells engulf bacteria via a process called----------.**

a- Phagocytosis
b- Pinocytosis
c- Osmosis
d- Receptor-mediated endocytosis

**8) Which of the following processes occur via the allosteric site of an enzyme?**

a- Competitive inhibition
b- Feed-back inhibition
c- Cooperativity regulation
d- Both a and c

**9) Which of the following is a primary function of the active site of an enzyme?**

a- It binds to the allosteric regulators of the enzyme
c- It binds to the noncompetitive inhibitors of the enzyme.
b- It binds to the substrate and catalyzes the reaction of the enzyme
d- It binds to the end product during the feed-back inhibition of the enzyme

**10) The catalytic activity of an enzyme is occurring via its ----------**

a- Active site
b- Passive site
c- Allosteric site
d- Cooperative site

**11) Which of the following terms does NOT refer to allosteric regulation?**

a- Feedback inhibition
b- Competitive inhibition
c- Allosteric activation
d- Allosteric inhibition

**12) Competitive inhibitors stop an enzyme activity by----------**

a- Changing the shape of the enzyme
b- Merging with the substrate instead
c- Combining with the product of the reaction
d- Blocking the active site of the enzyme

**13) Which of the following is correct about the enzyme?**

a- Lowers the energy of activation
b- Decreases the pH
c- Increases the energy of activation
d- Increases the pH

**14) Which of the following controls the feedback inhibition of the enzyme?**

a- Concentration of the substrate
b- Concentration of the enzyme
c- Type of the substrate
d- Concentration of the end product

**15) In cellular respiration, glycolysis takes place in the…….**

a- mitochondrial matrix
b- mitochondrial inner membrane
c- mitochondrial intermembrane space
d- cytosol

**16) Which of the following produces 90% of ATP during cellular respiration?**

a- glycolysis
b- substrate-level phosphorylation
c- substrate-level phosphorylation
d- oxidative phosphorylation (chemiosmosis)

**17) Which of the following processes do not occur in fermentation?**

a- Krebs cycle
b- glycolysis
c- chemiosmosis
d- both A and C

**18) When muscle cells undergo anaerobic respiration, ……. Is formed and causes muscle fatigue and pain**

a- pyruvate
b- ethanol
c- lactate
d- $CO_2$

**19) The catabolic pathway of organic molecules in the presence of O2 is called--------**

a- Hydration
b- Aerobic respiration
c- Alcohol fermentation
d- Fermentation

**20) The most important product molecule in cellular energy is--------**

a- FAD
b- NAD
c- ATP
d- CO2

**21) In cellular respiration, NAD+ functions as-------**

a- Oxidizing agent
b- Reducing agent
c- Enzyme
d- Catalyst

**22) In chemiosmosis, electrons drop in free energy as they pass down----------**

a- The outer membrane of mitochondria
b- The electron transport chain
c- Proton gradient
d- The cell membrane

**23) In cell respiration, ATP can be recycled from ADP by -------**

a- Oxygenation
b- Hydrogenation
c- Hydration
d- Phosphorylation

**24) For each glucose molecule that enters glycolysis, ---------- acetyl CoA will enter the Krebs cycle**

a- Two
b- One
c- Four
d- Six

**25) Which of the following does not apply for glycolysis?**

a- It occurs in the cytoplasm
b- It produces 2 ATP
c- It splits glucose into two molecules of pyruvate
d- It needs O2 to occur

**26) Which stage of the cellular respiration releases CO2?**

a- Fermentation
b- Electron transport chain
c- Krebs cycle
d- Glycolysis

**27) The function of NADH and FADH2 is ----------**

a- Carrying electrons to the electron transport chain
b- Binding with acetyl CoA
c- Oxidizing organic molecules
d- Producing water

**28) Which of the following is the correct sequence of the cell cycle?**

a- G1→M→S→G2
b- G1→S →G2→M
c- M→G2→S→G1
d- G2→S→G1→M

**29) The centromere is a region in which……..**

a- sister chromatids attach to one another until anaphase
c- chromosomes become aligned at the metaphase plate
b- chromosomes are grouped during telophase
d- new spindle microtubules form at either end

**30) The spindle fibers connect to the chromosomes via----------**

a- The centromere
b- The kinetochore
c- The centriole
d- The centrosomes

**31) The mitotic spindle plays a critical role in which of the following processes?**

a- splitting of the cell (cytokinesis) following mitosis
c- triggering the compaction and condensation of chromosomes
b- dissolving the nuclear membrane
d- separation of sister chromatids

**32) Metaphase is characterized by _____.**

a- alignment of chromosomes on the equator of the cell
b- separation of the centromeres
c- separation of sister chromatids
d- cytokinesis

**33) Certain cell types normally have several nuclei per cell. How could such multinucleated cells be explained?**

a- The cell underwent repeated cytokinesis but no mitosis
c- The cell underwent repeated mitosis with simultaneous cytokinesis
b- The cell underwent repeated mitosis, but cytokinesis did not occur.
d- The cell had multiple S phases before it entered mitosis

**34) The display of an individual's chromosomes that are arranged according to sizes and shapes is called----------**

a- Genotype
b- Phenotype
c- Karyotype
d- Polyploidy

**Q2: Write whether of the following statements is True (T) or False (F)**

1- NAD+ and FADH2 are protein catalysts that speed up the rate of the metabolic reactions without being consumed in the reaction. F
2- The Krebs cycle occurs in the matrix of the mitochondrion, and the Electron Transport chain occurs in the inner membrane F
3- In glycolysis, glucose is split into one molecule of pyruvic acid F
4- Oxygen is the final acceptor of electrons during aerobic respiration T
5- The first division (meiosis I) separates homologous chromosomes T
6- Multicellular organisms use meiosis to repair and renew cells F
7- In prophase-I, tetrads occur between the homologous chromosomes F
8- Cytokinesis usually occurs just prior to mitosis F
9- Crossing over is partially responsible for our genetic diversity` F
10- Karyotype is a display of an individual's chromosomes those are arranged according to sizes and shapes T