Q 1: Choose the most correct answer (one answer only):

1. A cell with membrane-bound proteins (receptors) that selectively bind a specific hormone is called……..

A) secretory cell. B) blood cell.
C) unresponsive cell. D) target cell.

2. The cell that secrets neurohormones is known as……..

A) a neuron in the spinal cord. B) a steroid-producing cell in the adrenal cortex.
C) a neurosecretory cell. D) a cell in the pancreas that produces digestive enzymes.

3. Iodine is added to table salt to help prevent deficiencies of an essential mineral needed for the proper function of which of the following?

A) parathyroid glands. B) adrenal glands.
C) thyroid glands. D) the endocrine pancreas.

4. One reason a person might be severely overweight is due to which of the following?

A) a decreased level of thyroxine.
B) a defect in hormone release from the posterior pituitary.
C) a lower than normal level of insulin-like growth factors.
D) hyposecretion of oxytocin.

5. Which of the following is/are considered as endocrine gland(s)?

A) parathyroid. B) salivary.
C) sweat. D) gallbladder.

6. Which of the following has both endocrine and exocrine activity?

A) the pituitary gland B) parathyroid glands
C) the pancreas D) adrenal glands

7. Analysis of a blood sample from a fasting individual showed low level of glucose may indicate high levels of which of the following hormones?

A) insulin. B) glucagon.
C) gastrin. D) glucose.

8. What will happen when the beta cells of the pancreas release insulin into the blood?

A) the blood glucose levels rise to a set point and stimulate glucagon release.
B) the skeletal muscles and the liver cells take up glucose at a faster rate.
C) the liver breaks down glycogen.
D) the alpha cells of the pancreas release glucose into the blood.

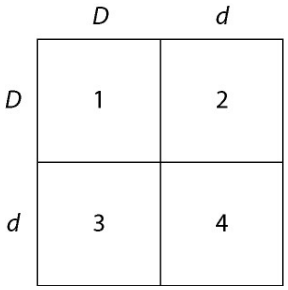
9. After eating a carbohydrate-rich meal, the mammalian pancreas increases its secretion of which of the following?

A) glucagon. B) thyroxine.
C) oxytocin. D) insulin.

10. Two plants are crossed, resulting in offspring with a 3:1 phenotypic ratio for a particular trait. What does this suggest?

A) that each offspring has the same alleles for each of two traits
B) that the trait shows incomplete dominance
C) that a blending of traits has occurred
D) that the parents were both heterozygous for a single trait

11. If (DD) and (Dd) mean Pink color and (dd) means white color in peas' flower, so, if a homozogus pea's flower of pink color (DD) is crossed with a white color one (dd), and the F_1 offspring was allowed to self-pollinate. Which of the following boxes marked from 1 to 4 corresponds to plants with <u>Pink color</u>?



A) box 1 only
B) boxes 1 and 2
C) boxes 2 and 3
D) boxes 1, 2, and 3

12. Which enzyme catalyzes the elongation of a DNA strand in the 5' → 3' direction?

A) primase
B) DNA ligase
C) DNA polymerase
D) helicase

13. If the sequence of an area of a gene is: 3' T G C A A T C C 5', an RNA complementary sequence will be…….

A) 5' G C C T A G G 3'
B) 3' G C C T A G G 5'
C) 5' A C G T T A G G 3'
D) 5' A C G U U A G G 3'

14. What is the function of DNA helicase?

A) to untwist the DNA helix during replication
B) to seal together the broken ends of DNA strands
C) to add nucleotides to the 3' end of a growing DNA strand
D) to rejoin the two DNA strands (one new and one old) after replication

15. The leading and the lagging strands differ in that……..

A) the leading strand is synthesized in the same direction towards the replication fork, whereas the lagging strand is synthesized in the opposite direction.
B) the leading strand is synthesized by adding nucleotides to the 3' end of the growing strand, whereas the lagging strand is synthesized by adding nucleotides to the 5' end.
C) the lagging strand is synthesized continuously, whereas the leading strand is synthesized in short fragments that are ultimately stitched together.
D) the leading strand is synthesized at twice the rate of the lagging strand.

16. A new DNA strand elongates only in the 5' to 3' direction because……..

A) DNA polymerase begins adding nucleotides at the 5' end of the template.
B) Okazaki fragments prevent elongation in the 3' to 5' direction.
C) DNA polymerase can only add nucleotides to the free 3' end.
D) replication must progress at both 3' and 5' ends..

17. What is the role of DNA ligase in the elongation of the lagging strand during DNA replication?

A) It synthesizes RNA nucleotides to make a primer.
B) It stabilizes the unwound parental DNA.
C) It joins Okazaki fragments together.
D) It unwinds the parental double helix.

18. Which of the following help(s) to hold the DNA strands apart while they are being replicated?

A) primase
B) ligase
C) DNA polymerase
D) single-strand binding proteins

19. Which enzyme builds the primer during DNA replication?

A) helicase
B) ligase
C) DNA polymerase I
D) primase

20. A particular triplet of bases in the template strand of DNA is 5' AGT 3'. The corresponding codon for the mRNA transcribed is…….

A) 3' UCA 5'.
B) 3' UGA 5'.
C) 5' TCA 3'.
D) 3' ACU 5'.

21. Which of the following is the first event to take place in translation of mRNA?

A) the small subunit of the ribosome recognizes and attaches to the start codon of mRNA.
B) base pairing of activated methionine-tRNA to AUG of the messenger RNA.
C) binding of the larger ribosomal subunit to smaller ribosomal subunits.
D) covalent bonding between the first two amino acids.

22. Which of the following is a point mutation that still code for an amino acid but change the resulting protein?

A) silent mutation
B) missense mutations
C) nonsense mutations
D) all A, B and C

23. Males are more often affected by sex-linked traits than females because…….

A) male hormones such as testosterone often alter the effects of mutations on the X chromosome.
B) female hormones such as estrogen often compensate for the effects of mutations on the X chromosome.
C) X chromosomes in males generally have more mutations than X chromosomes in females.
D) males are hemizygous for the X chromosome.

24. Color blindness is a sex-linked recessive trait (aa) in humans. Two people with normal color vision have a color-blinded son. What are the genotypes of the parents?

A) X^aX^a and X^aY
B) X^AX^a and X^AY
C) X^AX^A and X^aY
D) X^AX^A and X^AY

25. When a glucose molecule loses a hydrogen atom as the result of an oxidation-reduction reaction, the molecule becomes……

A) hydrolyzed.
B) hydrogenated.
C) oxidized.
D) reduced.

26. Where does glycolysis take place in eukaryotic cells?

A) mitochondrial matrix
B) cytosol
C) mitochondrial inner membrane
D) mitochondrial intermembrane space

27. Which of the following respiration processes will proceed normally whether oxygen is present or absent in an eukaryotic cell?

A) electron transport
B) glycolysis
C) the citric acid cycle
D) oxidative phosphorylation

28. In cellular respiration, the energy for most ATP synthesis is produced by……

A) high energy phosphate bonds in organic molecules.
B) electron transport chain.
C) converting oxygen to ATP.
D) transferring electrons from organic molecules to pyruvate.

29. After telophase-I of meiosis, the chromosomal makeup of each daughter cell is…….

A) diploid, and the chromosomes are each composed of a single chromatid.
B) diploid, and the chromosomes are each composed of two chromatids.
C) haploid, and the chromosomes are each composed of a single chromatid.
D) haploid, and the chromosomes are each composed of two chromatids.

30. A cell divides to produce two daughter cells that are genetically different; The statement is true for…….

A) mitosis.
B) meiosis I.
C) meiosis II.
D) mitosis and meiosis II.

31. Which of the following occurs in meiosis but not in mitosis?

A) chromosome replication
B) synapsis of chromosomes
C) production of daughter cells
D) alignment of chromosomes at the equator

32. Which of the following types of molecules are the major structural components of the cell membrane?

A) phospholipids and cellulose
B) nucleic acids and proteins
C) phospholipids and proteins
D) proteins and cellulose

33. The difference between pinocytosis and receptor-mediated endocytosis is that……

A) pinocytosis brings only water molecules into the cell, but receptor-mediated endocytosis brings in other molecules as well.

B) pinocytosis increases the surface area of the plasma membrane whereas receptor-mediated endocytosis decreases the plasma membrane surface area.

C) pinocytosis is nonselective in the molecules it brings into the cell, whereas receptor-mediated endocytosis offers more selectivity.

D) pinocytosis requires cellular energy, but receptor-mediated endocytosis does not.

34. Energy is not required for the movement of solute molecules from area of high concentration to area of low concentration, this means ……..

A) Passive transport B) Plasma membranse

C) Co-transport D) Active transport

35. A process of importing macromolecules into a cell by forming vesicles from the plasma membrane is called……..

A) Endocytosis B) Autophagy

C) secretion D) Exocytosis

36. A protein serving as a catalyst that changes the rate of a reaction without being consumed by the reaction is known as……..

A) ATP B) unstable

C) energy D) enzyme

37. How does a noncompetitive inhibitor decrease the rate of an enzyme reaction?

A) by binding at the active site of the enzyme

B) by binding at the allosteric site which changing the shape of the active site

C) by changing the free energy change of the reaction

D) by acting as a coenzyme for the reaction

38. All of the following are parts of a prokaryotic cell <u>except</u>……

A) an endoplasmic reticulum B) a cell wall.

C) a plasma membrane. D) ribosomes.

39. Large numbers of ribosomes are present in cells that specialized in producing which of the following molecules?

A) lipids B) glycogen

C) proteins D) cellulose

40. Which type of organelle or structure is primarily involved in the synthesis of oils, phospholipids, and steroids?

A) ribosome B) lysosome

C) smooth endoplasmic reticulum D) mitochondrion

41. Which of the following organelles contains hydrolytic enzymes in animal cells?

A) chloroplast B) lysosome

C) central vacuole D) peroxisome

42. The liver is involved in detoxification of many poisons and drugs. Which of the following structures is primarily involved in this process and therefore abundant in liver cells?

A) rough ER B) smooth ER
C) Golgi apparatus D) nuclear envelope

43. Which of the following contain the 9 + 2 pattern of microtubules?

A) cilia B) centrioles
C) flagella D) both A & C

44. Which of the following molecules is not formed by dehydration reactions?

A) fatty acids B) disaccharides
C) polysaccharides D) protein

45. Sucrose, is a sugar composed of one glucose molecule joined by a glycosidic linkage to one fructose molecule. Thus, sucrose is classified as……

A) pentose B) hexose
C) monosaccharide D) disaccharide

46. All of the following are polysaccharides <u>except</u>…….

A) pentose. B) glycogen.
C) chitin. D) cellulose.

47. Which of the following statements concerning saturated fats is <u>not true</u>?

A) They are more common in animals than in plants.
B) They have double bonds in the carbon chains of their fatty acids.
C) They generally solidify at room temperature.
D) They contain more hydrogen than unsaturated fats having the same number of carbon atoms.

48. The bonding of two amino acid molecules to form a larger molecule requires…….

A) the release of a water molecule. B) the release of a carbon dioxide molecule.
C) the addition of a nitrogen atom. D) the addition of a water molecule.

49. Which of the following stages is not part of protein synthesis at the ribosomes?

A) Base-pair substitution. B) initiation.
C) elongation. D) termination.

50. The hormone which targets other endocrine glands and is important to understanding chemical coordination is known as:

A) tropic hormone B) steroid hormone
C) amino acid derivative hormone D) either B or C

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

1. ( ) Carbohydrates are substance that speeds up a chemical reaction but is not used up itself or permanently changed.

2. ( ) Chitin is a structural polysaccharide in insects.

3. ( ) Competitive inhibitor is a substance that reduces the activity of an enzyme by binding to its active site.

4. ( ) Peptide bond is the chemical bond that forms between the carboxyl group of one amino acid and the amino group of another amino acid.

5. ( ) Cellular respiration is the metobolic process that generates ATP by extracting energy from sugars, fats, and proteins.

6. ( ) Ribosomes are the center of manufacturing, warehousing, sorting, and shipping for the cell.

7. ( ) Smooth Endoplasmic Reticulum has ribosomes on their outer surface, where the cell's proteins are made.

8. ( ) Prokaryotic cell is a type of cell having a membrane-enclosed nucleus and membrane-enclosed organelles.

9. ( ) Lytic Cycle allows replication of the virus genome and destroying the host cell.

10. ( ) Gram negative bacteria has large amount of peptidoglycan, and thus, is stained by Gram stain.

11. ( ) Membrane protein can play a role in both active and passive transport of small molecules.

12. ( ) ATP synthase plays an important role during pre-Krebs cycle.

13. ( ) Crossing over occurs between two non-sister chromatids of two homologous chromosomes during prophase-I.

14. ( ) Osmosis is a kind of passive diffusion in which solute molecules move from hypotonic to hypertonic solution until equilibrium.

15. ( ) Glucagon is an antidiuretic hormone and causes uterine muscles to contract.

16. ( ) Goiter is a disease results from Hyperthyroidism.

17. ( ) Insulin is secreted from alpha cells of the pancreas and promotes the movement of glucose into cells (decrease blood sugar).

18. ( ) Both T3 and T4 cause decrease in metabolic rates, and have the same number of (I).

19. ( ) The Prolactin hormone stimulates mammary glands development and milk production in females.

20. ( ) Glucagon and Glucocorticoids are antagonistic hormones.

21. ( ) Homeostasis of blood calcium level is maintained by Calcitonin and PTH.

22. ( ) Huntington's disease is a human genetic disease caused by a recessive allele for a dysfunctional enzyme, leading to accumulation of certain lipids in the brain and followed by death within a few years.

23. ( ) Heterozygous individual always having two identical alleles for a given gene.

24. ( ) Feedback inhibition is a method of metabolic control in which the end product of a metabolic pathway acts as an activator of an enzyme within that pathway.

25. ( ) Mendel's first law (Law of segregation), stating that the two alleles in a pair segregate (separate from each other) into different gametes during gamete formation.

26. ( ) Transcription is the synthesis of a polypeptide using the genetic information encoded in a mRNA molecule.

27. ( ) Anticodon is a nuceotide triplet at one end of a tRNA molecule that base-pairs with a particular complementary codon on an mRNA molecule.

28. ( ) Polyribosome (polysome) is a group of several ribosomes attached to, and translating, the same messenger RNA molecule.

29. ( ) The start point of replication (at the middle of bubble) is a site where the replication of a DNA molecule begins.

30. ( ) Okazaki fragments are short segments of DNA synthesized away from the replication fork on a template strand during DNA replication, many of which are joined together by ligase to make up the lagging strand of newly synthesized DNA.