Al Azhar University-Gaza
Cell Biology/Pharmacy
By : Mona Wadi

1st semester 2017/2018
Midterm
Time: One hour

اسم الطالب:

Q.1. Choose the correct answer:

1. Collagen is
a. transport protein b. structural protein
c. contractile protein d. regulatory protein

2. Put the following steps of DNA replication in order:
1) Single-stranded binding proteins attach to DNA strands
2) Hydrogen bonds between base pairs of antiparallel strands are broken
3) Primase binds to the site of origin
4) DNA polymerase binds to the template strand
5) An RNA primer is created.
a. 1, 2, 3, 5, 4 b. 1, 2, 3, 4, 5 c. 2, 1, 3, 5, 4
d. 1, 2, 3, 5, 4 e. 2, 1, 3, 4, 5

3. Hydrolysis is involved in which of the following?
a. Peptide bonding in proteins
b. formation of triglycerides
c. The digestion of polysaccharides to glucose
d. Hydrogen bond formation between nucleic acids.
e. The hydrophobic interaction of lipids

4. During DNA replication, if one strand of a DNA molecule has the sequence 5'-ATTGCA-3', the primer that is complementary to it would have the sequence
a. 3'-TAACGT-5' c. 3'-UAACGU-5'
c. 5'-TAACGT-3' d. 5'-UAACGU-3'

5. In the tertiary structure of protein, cross links between the R groups of cysteine are known as
a. disulfide bonds b. hydrophilic attractions
c. ionic bonds d. hydrogen bonds

6. The class of lipids that does not contain fatty acids is
a. fats b. oils c. steroids d. phospholipids e. waxes

7. What is the principal storage carbohydrate in plants?
a. starch b. glycogen c. cellulose d. chitin

8. The human body is composed mainly of (in order)
a. oxygen , hydrogen, carbon and nitrogen.
b. oxygen, nitrogen, carbon and hydrogen.
c. oxygen, nitrogen, hydrogen, and carbon.
d. oxygen, carbon, hydrogen and nitrogen.

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University-Gaza

1st semester 2017/2018
Midterm
Time: One hour

25½/40

9. The action of helicase creates
   a. primers and DNA fragments
   b. primers and replication bubbles
   c. DNA fragments and replication forks
   (d.) replication forks and replication bubbles
   e. DNA fragments and replication bubbles

10. The best approximate diameter of a typical plant cell is
   (a.) 0.5 mm b. 20 μ m c. 2-3 μ m d. 50 nm

11. When a protein is denaturated, which of the following protein structures is NOT affected?
   a. The tertiary structure b. The secondary structure
   (c.) The primary structure d. The quaternary structure

Q.2. Complete the following:

1½ 1. Sucrose consists of glucose and fructose that joined by covalent bond called glycosidic bond

1 2. Water has a high specific heat because of high hydrogen bonds and its importance is regulation the temperature of body and environment

1 3. The shape of prokaryotic DNA molecule is circular, but its shape in eukaryotes is Linear.

1 4. Chitin is a polymer of N-acetylglucosamine.

1 5. The capsule of bacteria is composed of polysaccharide while their pili consist of protein.

1 6. Phase contrast microscope is the microscope that depends on the differences in refractive index of structures within the specimen.

1 7. Function of sulfur in human body is Component of most proteins

1 8. Importance of terpenes is it is compound of many biologically pigment such as chlorophyll and visual pigment retinal

1½ 9. Phospholipid molecule consists of glycerol, two fatty acids and phosphate group

1 10. Blood alkalosis is defined as the condition of human blood pH (7.4) that increases 0.2 to 0.4 points

1/7/2018

(10)

Q.3. True or false? And correct the false.

1. (X) Dissection microscope and transmission electron microscope give a three dimensional view. → two-dimensional view
2. (X) When the cell becomes large, the ratio of surface area to volume becomes large. → small
3. (✓) Essential amino acids cannot be synthesized by an organism.
4. (X) Triglycerides are solid at room temperature because they have saturated fatty acids that allow the chains to pack together tightly. → Fats
5. (X) The size of the field of view increases when magnification of microscope increases. → decreases
6. (✓) DNA ligase forms a bond between the 3'OH of one segment and the 5' phosphate of the adjacent segment, joining the DNA fragments together.
7. (X) The non covalent bond that can be formed between side chains of valine and alanine is hydrogen bond. → hydrophobic interaction
8. (✓) Hydrolysis of one molecule of a triglyceride to glycerol and fatty acids yields three molecules of water.
9. (X) Glucose and galactose differ in positions of their carbonyl groups. → OH on C_4
10. (✓) Lysine is basic amino acid, while serine is polar amino acid.

(6)

Q.4. What is the mechanism of carbonic/bicarbonate buffer system to maintain blood pH at low pH?

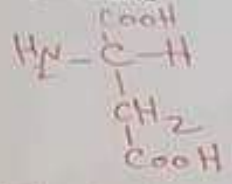
(3)

$HCO_3^- + H^+ \longrightarrow H_2CO_3$

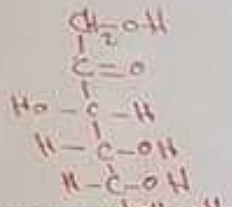
HCO_3^- (bicarbonate) reacts with excess of H^+ and form carbonic H_2CO_3

Q.5. Draw the following:

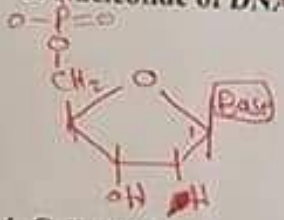
1. **Aspartic acid**



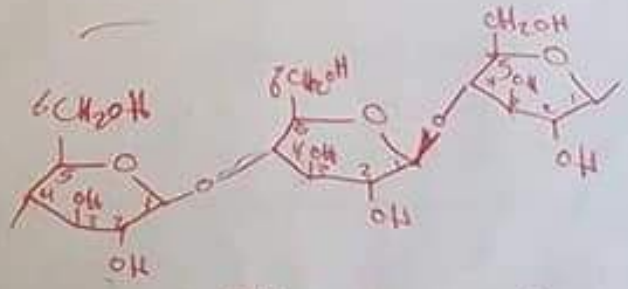
2. **Fructose (straight chain)**



3. **Nucleotide of DNA**



4. **Cellulose**



β(1→4) glycosidic bond

Good luck☺

Al Azhar University-Gaza
Cell biology/Pharmacy
Time: 2 hours

Final exam.
1st semester 2010/2011
Student Name:----------

Answer all the following questions

Q.1. True or False? And correct the false. (15 marks)

1. (✓) Germ line cells and somatic cells are diploid (2n).

2. (✗) Synapsis, crossing over, and reduction of number of chromosomes occur during prophase I.

3. (✓) Translocation results when a segment of DNA breaks off, moves from one chromosome, and is inserted into its homologous chromosome.

4. (✗) In Na / K pump, three Na^+ pumping in the cell and two K^+ out.

5. ( ) Insulin is made up of two polypeptide chains that are synthesized separately.

6. (✓) Microfilaments are about 7 μm in diameter, while microtubules are about 25 μm in diameter.

7. ( ) Dyneins move organelles toward the nucleation center.

8. (✓) The E site is the site on the small subunit of ribosome from where the tRNA leave the ribosome.

9. (✗) In counter transport, Na^+ enters the cell against its concentration gradient while Ca^{++} leaves the cell down its concentration gradient.

10. (✓) Somatic mutations are passed on to the daughter cells after mitosis.

11. (✓) The proteins which are sent to nucleus, mitochondria, and lysosomes are synthesized on free ribosomes and released to the cytoplasm.

12. ( ) Interleukin is a protein that stimulates the production of red blood cells.

13. (✓) The aim of mitosis in unicellular and multicellular organisms is reproduction.

14. ( ) The smooth endoplasmic reticulum is responsible has a role in blood glucose homeostasis.

15. ( ) Water contracts (get smaller) when it freezes, so it floats on the surface of liquid water

Q.2. Choose the correct answer: (45 marks)

1. The chromosome that has only one arm is called

a. telocentric chromosome

b. acrocentric chromosome

c. submetacentric chromosome

d. metacentric chromosome

2. The action of helicase creates _____.

a. primers and DNA fragments

b. primers and replication bubbles

c. DNA fragments and replication forks

d. replication forks and replication bubbles

e. DNA fragments and replication bubbles

3. The antiparallel nature of double-stranded DNA means that

a. the two strands run from 5' to 3' in opposite direction.

b. the 5' ends of the two strands are on the opposite ends of the DNA molecule.

c. the two DNA strand twist around each other in a helical patter.

d. (a and b)

e. (a and c)

4. A protein that is composed of more than one polypeptide has
   a. primary structure
   b. secondary structure
   c. tertiary structure
   d. quaternary structure

5. How is water's high heat of evaporation beneficial to us?
   a. It allows us to cool by sweating
   b. It allows better temperature control inside cells
   c. It keeps cells from becoming hydrophobic
   d. It protects enzymes from rises in temperature which would deactivate them

6. Bacteria do not have
   a. ribosome
   b. a plasma membrane
   c. a true nucleus
   d. a genome.

7. Which of these does not require energy?
   a. simple diffusion
   b. osmosis
   c. facilitated diffusion
   d. all of the above

8. Decreasing of the cholesterol level in human blood is carried out by
   a. pinocytosis
   b. phagocytosis
   c. exocytosis
   d. receptor mediated endocytosis

9. Chromosomes replicate in
   a. prophase
   b. G_1 phase
   c. G_2 phase
   d. S phase

10. ----- anchor the nucleus and some organelles to their places in the cell.
    a. Intermediate filaments
    b. Microtubules
    c. Microfilaments
    d. Centrioles

11. The process by which the bacteria enter the cell is called
    a. pinocytosis
    b. phagocytosis
    c. exocytosis
    d. none of the above

12. Which of the following types of transport does NOT require the use of a transport protein?
    a. both simple diffusion and facilitated diffusion
    b. facilitated diffusion
    c. active transport
    d. simple diffusion

13. What organelle processes and packages proteins before sending them through the cell
    a. Endoplasmic reticulum
    b. Ribosome
    c. Vesicle
    d. Golgi apparatus

14. Where are ribosomes produced?
    a. nucleus
    b. nucleolus
    c. nuclear envelope
    d. nucleoplasm

15. ----- move the chromosomes in cell division.
    a. Microtubules
    b. Intermediate filaments
    c. Microfilaments
    d. Centrioles

16. Insulin is
    a. transport protein
    b. structural protein
    c. contractile protein
    d. regulatory protein
    e. none of the above

17. ----- is non branched polymer of β-glucose.
    a. Chitin
    b. Cellulose
    c. Amylose
    d. Amylopectin
    e. Glycogen

18. ------- is base substitution that result in change in amino acid.
    a. Silent mutation
    b. Nonsense mutation
    c. Missense mutation
    d. Frame-shift mutation

19. Which of the following statements concerning membrane proteins is incorrect?
    a. They act as a channel, allowing the transport of ions across the membrane.
    b. They may be receptor proteins.
    c. They often require ATP to actively transport materials across the membrane
    d. They are not specific.

20. Which of the following processes uses a difference in concentration (or concentration gradient) to transport molecules across the cell membrane?
    a. osmosis
    b. simple diffusion
    c. facilitated diffusion
    d. all of the above

21. An essential amino acid is an amino acid that
    a. must be provided in the diet
    b. is missing from the diet
    c. is synthesized in the body
    d. all of the above

22. In the tertiary structure of hair, cross links between the R groups of cysteine are known as
    a. disulfide bonds
    b. hydrophilic attractions
    c. ionic bonds
    d. hydrogen bonds

23. The primary structure of a protein is determined by

a. the hydrogen bonding in the molecule

b. The sequence of amino acids in the protein

c. The way amino acids coil around themselves

d. All of the above

24. The class of lipids that does not contain fatty acids is

a. triglycerides

b. steroids

c. phospholipids

d. waxes

25. Triglycerides are formed from their building units by

a. dehydration reactions

b. hydrolysis reactions

c. hydration reactions

d. oxidation reactions

26. In addition to their role as energy storage compounds, lipids are used to:

a. make steroid hormones
b. make cell membrane components
c. support organs
d. make organs warm
e. all the above

27. What is the principal carbohydrate storage product in plants?

a. Starch
b. Glycogen
c. Cellulose
d. Glucose

28. In amylopectin, the glucose molecules are connected by

a. beta-1,4- glycosidic bonds
b. alpha-1,6-glycosidic bonds
c. alpha-1,4-glycosidic bonds
d. alpha-1,4-glycosidic bonds and alpha-1,6-glycosidic bonds

29. The mRNA in the cell

a. carries the genetic code from DNA to the ribosomes
b. carries amino acids to the ribosome for protein synthesis
c. combines with protein to form the ribosomes
d. all f the above

30. In a nucleotide, the nitrogenous base is attached to the sugar's _____ carbon and the phosphate group is attached to the sugar's _____ carbon.

a. 1' ... 2'
b. 1' ... 5'
c. 2' ... 3'
d. 1' ... 3'
e. 2' ... 1'

31. RNA molecule differs from a DNA molecule because

a. RNA is a single strand of nucleotides

b. RNA contains uracil

c. RNA contains ribose

d. All of the above

to:

32. Why is the new DNA strand which is complementary to the 3' to 5' strands assembled in Okazaki fragments?

a. the replication forks prevent the formation of longer strands
b. DNA polymerase can assemble DNA only in the 3' to 5' direction
c. DNA polymerase can assemble DNA only in the 5' to 3' direction
d. All of the above

33. The cilia and flagella of eukaryotic cells are composed of _____.

a. microtubules
b. intermediate filaments
c. microfilaments
d. pili

34. The cell junctions in plant cells that provide channels between adjacent cells are generally _____.

a. anchoring junctions
b. gap junctions
c. plasmodesmata
d. tight junctions
e. synapses

35. The human body is composed mostly of

a. oxygen, hydrogen, phosphorus, and calcium
b. oxygen, hydrogen, calcium, and iron
c. oxygen, nitrogen, hydrogen, and carbon
d. oxygen, nitrogen, calcium, and phosphorus

36. Which of the following statements is true about DNA replication?

a. One DNA molecule becomes two identical ones as a result of this process.
b. It occurs during meiosis but not mitosis
c. It is part of the protein synthesis process
d. All of the above

37. Portions of DNA molecules that do not contain the codes for proteins are called:

a. introns
b. exons
c. mutagens
d. non of the above

38. The DNA code is

a. specific to humans
b. found only in mammals
c. shared by all living things
d. All of the above

39. In eukaryoutes, transcription takes place in

a. Nucleus
b. Nucleolus
c. Cytoplasm
d. Endoplasmic reticulum

40. RNA is synthesized on a DNA template in a process called _____, which utilizes the enzyme _____

a. translation, RNA polymerase
b. transcription, DNA polymerase
c. transcription, RNA polymerase
d. replication, DNA polymerase

41. DNA is found in which of the following organelles?

a. Mitochondria
b. Chloroplast
c. Nucleus
d. All of the above

42. If a plant cell loses water, it is said to undergo which of the following processes.

a. Hydrolysis

b. Plasmolysis

c. Photosynthesis

d. Turgor pressure

43. The major components of extracellular matrix in animal cells are

a. glycolipids

b. lipoproteins

c. glycoproteins

d. lipids

e. sugars

44. The role of the oligosaccharides on the cell membrane is?

a. To make ATP

b. Cell recognition

c. Allow substances into the cell

d. Food

45. Our intestine is lined with individual cells. No fluids leak between these cells from the gut into your body. Why?

a. The intestinal cells are fused together into one giant cell.
b. The intestinal cells are bound together by plasmodesmata.
c. The intestinal cells are bound together by tight junctions.
d. The intestinal cells are bound together by gap junctions.
e. The intestinal cells are bound together by anchoring junctions

Q.3. Complete the following: (10 marks)

1. Lactose consists of ---------- and ---------- that joined by covalent bond called ----------.

2. The intermediate filaments that occur in all types of muscle fibers composed of protein called ----------.

3. Meiosis is reduction division because ----------.

4. ---------- is a specific nucleotide sequence of DNA where RNA polymerase binds and initiates transcription.

5. The first step in protein synthesis is the activation of amino acids by enzymes called ----------, and its function is ----------

6. The type of animal ribosomes is 80S ribosomes. The S referrers to ---------- and it is defined as ----------.

7. The ATP consists of ----------, ---------- and ----------.

8. DNA replication is semi-conservative, and this means ----------

9. During S phase, the centromere is bound to a disk of protein called ---------- This disk functions as ----------.

10. ---------- is the microscope that uses ultraviolet to illuminate specimens.

Q.4. What are the differences between the following: (10 ma

1. Fat and oil

2. Desmosomes and hemidesmosomes

3. Heterophagosomes and autophagosomes

4. Intermediate filaments and microfilaments

Q.5. With drawing illustrate the following: (10 marks)

1. The fluid mosaic model

2. Lysine

3. Cellulose

4. The composition of flagella

Q.6. Write about the following:(10 marks)

1. The three checkpoints that control the cell cycle in eukaryotes.

2. Spermatogenesis

Lecturer

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2. Spermatogenesis

Lecturer