Cell biology: 35 questions x 1.5 pts

<u>Series A</u>: Give one correct answer for each of the following questions.

1- Regarding the bacterial cell wall, it is correct to say that:

a. Gram negative bacteria have LPS.
b. the periplasmic space contains only water.
c. the peptidoglycan layer is thicker in Gram- /Gram+.
d. teichoic acid is present in the plasma membrane.

2- Regarding bacteria, it is correct to say that:

a. they require a host cell to divide.
b. the chromosome is a single-stranded circular DNA.
c. they have a single circular chromosome.
d. the flagellum is necessary for adhesion.

3- Viruses :

a. of influenza virus are wrapped by a capsule.
b. have all DNA wrapped into a capsid.
c. size ranges is from 20 to 200 micrometers.
d. no correct answer.

4- Regarding mineral salts, it is correct to say that:

a. they are macromolecules.
b. they are more abundant than organic molecules.
c. they never interact with organic molecules.
d. calcium is important for actin-myosin interaction.

5- Regarding lipids of the membrane, it is correct to say that:

a. they are all linked with carbohydrate residues.
b. certain amphipathic saponifiable lipids contain glycerol.
c. gangliosides contain phosphate group.
d. no correct answer.

6- Amino acid polymerization:

a. produces a polypeptide chain.
b. starts at the C-terminus and ends at T-terminus.
c. involves glycosidic bond formation.
d. involves formation of phosphodiester bonds among amino acids.

7- Regarding proteins, it is correct to say that:

a. they are active immediately after their release from the ribosome.
b. they all contain amino acids only.
c. all structural organization levels depend on the primary structure.
d. no correct answer.

8- Examples of homopolysaccharides include:

a. glycogen and glycosaminoglycans.
b. cellulose and chondroitin sulfate.
c. starch and glycogen.
d. cellulose and hyaluronic acid.

9- Regarding tRNA class, it is correct to say that they:

a. are of intermediate abundance and intermediate heterogeneity.
b. have no tertiary structure.
c. are translated into proteins.
d. no correct answer.

10- Regarding the lipid bilayer, it is right to say that:

a. the hydrophobic tails of neighboring phospholipids are covalently linked.
b. fluidity is important for function.
c. all proteins are covalently linked to lipids.
d. carbohydrates are evenly distributed in the two layers.

11- Prions are characterized by being:

a. abnormal DNA.
b. sensitive to proteases.
c. a normal protein structure.
d. highly stable.

12- Regarding plasma membrane components, it is correct to say that:

a. integrins are intrinsic (integral) proteins.
b. cadherins are peripheral protein.
c. phosphatidyl inositol is mainly found on the outer layer.
d. no correct answer.

13- Regarding junctions, which of the following combinations is correct?

a. Zonnula occludens- occludins- intermediate filament.
b. Zonula adherens- cadherins- thick filaments.
c. Macula adherens - cadherins- intermediate filaments.
d. Gap junction- connexins- actin filaments.

Series B: Give two correct answers or fill in the blank with appropriate keywords.

14- Regarding ribosomes, it is right to say that:

a. their sedimentation coefficient is different in eukaryotes from prokaryotes.
b. they are present in viruses.
c. they have tRNA binding sites.
d. they are absent in bacteria.

15- Regarding microtubules, it is correct to say that:

a. they all have the same diameter but different length and stability.
b. their polymerization requires only ATP.

c. lengthening and shortening occurs at the minus extremity. d. they occur in centrosomes.

16- Actin filaments:

a. may be linked to cadherins via catenins. b. are missing in the cell cortex.

c. are present along with desmin in cilia. d. their monomer is globular in shape.

17- Intermediate filaments:

a. may comprise six classes of monomers such as lamins. b. are polymers of globular monomers.

c. do interact with other cytoskeleton components. d. include myosin filaments.

18- The vesicular flux (movement) in a eukaryotic cell is:

a. from ER to nuclear envelope to Golgi to plasma membrane. b. from nuclear envelope to Golgi to ER to lysosomes.

c. from RER to Golgi to plasma membrane. d. mediated by the cytoskeleton.

19- Regarding the smooth endoplasmic reticulum, it is correct to say that:

a. it contributes to glycogenolysis. b. along with peroxisomes, it is responsible for detoxification.

c. it mediates protein synthesis. d. it contains glycosylation enzymes.

20- Golgi apparatus:

a. is usually made up of many dictyosomes. b. mediates lysosomal enzymes sorting at its cis compartment.

c. is a site of intracellular digestion. d. contains more cisternae per dictyosome in plant cells relative to animal cells.

21- Regarding lysosomes, it is correct to say that:

a. their enzymes are found in their lumen only. b. digestion occurs in all three classes.

c. digestion starts in the secondary lysosomes. d. digestion is sometimes incomplete.

22- Which of the following events occur during prophase of mitosis in animal cells?

a. disassembly of the nuclear lamina. b. termination of centrosome duplication.

c. cell stretching by polar microtubules. d. nuclear envelope assembly.

23- Mitochondria:

a. similarly to peroxisomes, divide by binary fission. b. inner membrane is richer in proteins.

c. number is constant in a cell. d. ribosomes are larger than the cytosolic ones.

24- Which if the followings belong to the stroma of a chloroplast?

a. Calvin cycle enzymes including Rubisco. b. ATP synthase and chlorophyll.

c. photosynthetic chain and Rubisco. d – ribosomes and circular double stranded DNA.

25- Cytokinesis in eukaryotes may involve:

a. microtubules. b. Golgi apparatus. c. glyoxysomes. d. nuclear envelope.

26- In addition to cellulose, ... pectin is a main component of the cell wall, it is especially present in the middle lamella.

27- The . . . . . .SER . . . . is abundant in Leydig cells since they are actively synthesizing and secreting steroids.

28- . . . .. Histone H1 . . . . . is a protein that mediates condensation of the 11 nm-fiber (beads on a string filament) into a 30 nm solenoid chromatin fiber.

29- A contractile ring of . . . .actin . . . . . filaments is responsible for cell constriction during cytokinesis of animal cell.

30- Glycolysis transforms a glucose molecule into . . . . . pyruvate . . . . . which is then converted into acetyl co-enzyme A.

31- The light-dependent reactions of photosynthesis take place in the chloroplast, precisely in the. . . . . thylakoid. . . . . .

32- . . . . .Oligosaccharyl transferase . . . . . .and glycosyl transferase are the 2 enzymes that catalyze N-glycosylation in the RER.

33- Two sets made up of six connexins each, form a functional. . . . gap junction . . . . . between two neighboring cells.

34- The . . . . kinetochore . . . . . which assembles with chromosome centromeres contains motor proteins.

35- Carotenoids which determine the carrot root color are found in an organelle named . . .chromoplast. .

Plant Histology (10 pts). Choose the right answer:

1- Xylem:

a- Is a complex tissue b- Plays many roles c- Is entirely made of dead cells d- All of the above

2- The primary wall

a- is the only wall of lignified cells b- has a regular texture

c- is located between the plasma membrane and the middle lamella d- (b) and (c) are true

3- Tracheids

a- characterize xylem of gymnosperms and pteridophytes b- never existed in angiosperms

c- are highly specialized elements formed in all vascular plants d- (a) and (c) are true

4- Cambial cells are:

a- isodiametric. b- at the origin of all types of tissues. c- have thin cellulosic walls. d- include small vacuoles.

5- Above-ground epidermal hair:

a- Could be unicellular or multicellular b- Are epidermal appendages

c- Could have secretory function d- All of the above

6- Parenchyma tissues are:

a- Always chlorophyllien b- Present in aerial and underground plant organs

c- Made of cells with thick cell walls d- Made of living cell walls having a unique shape

7- The mesophyll of dicotyledonous angiosperms

a- is homogeneous b- is heterogeneous c- has a parenchyma devoid of chloroplasts. d- (b) and (c) are true

8- Which of the following tissues are strictly secondary:

a- Parenchyma b- Cork c- Collenchyma d- Sclerenchyma

9- The epidermis is:

a- only present in aerial plant organs. b- a protective tissue.

c- always made of unicellular cell layer. d- made of cells that are uniformly surrounded by cuticle.

10- The palisade tissue

a- is a chlorophyll parenchyma b- is common in the underground organs of a plant

c- is rich in gaps d- is a storage tissue