Cell Biology

1- Bacteria:

a. divide by mitosis. b. are compartmentalized. c. have respiratory chain proteins in the mitochondria.
d. they all have one or more flagella. e. no correct answer.

2- Viruses:

a. can be visualized under a light microscope. b. are never related to cancer.
c. that have RNA without reverse transcriptase can undergo lysogeny.
d. their ribosomes are smaller than bacterial ribosomes. e. no correct answer.

3 - inorganic components of the cell:

a. include mineral salts that occur at the same concentration in all cell compartments.
b. are also named macromolecules. c. include water which interacts with organic molecules.
d. a and c are correct. e. no correct answer.

4 - Proteins:

a. primary structure is the amino acids sequence where amino acids are linked by ionic bonds.
b. may be soluble or not based on their size. c. are all functional once they acquire a tertiary structure.
d. may be heteroproteins such as hemoglobin. e. no correct answer.

5 - Regarding carbohydrates:

a. glycogen and GAGs are homopolysacharides. b. simple oses contain nitrogen in their basic structure.
c. the monomers are linked by N-glycosidic bonds in a polysaccharide.
d. they are found at the inner layer of plasma membrane. e. no correct answer.

6 - Cell lipids:

a. that contain fatty acids are saponifiable. b. such as sphingomyelin contains glycerol and fatty acid.
c. such as cholesterol occur in all cell membranes.
d. such as cerebrosides contain a phosphate group. e. no correct answer.

7 - Regarding nucleic acids:

a. the nitrogenous base is linked to carbon 3' of the ose. b. nucleosides monophosphate occur in RNA molecules.
c. in the poly-A tail nucleotide, the sugar is deoxyribose.
d. among RNA classes, tRNA is the most abundant type. e. no correct answer.

8 - Regarding plasma membrane:

a. intrinsic proteins always cross the lipid bilayer only once. b. membrane fluidity depends on cholesterol.
c. glycolipids are found in the outer layer. d. lipid passive flip-flop movement is frequent. e. b and c are correct.

9 - Among plasma membrane proteins, we find:

a. keratins and cadherins. b. cadherins and lamins. c. lamins and integrins.
d. b and c are correct. e. no correct answer.

10 - Regarding plasma membrane specializations:

a. microvilli are internally supported by thick filaments.
b. junctions that mediate cell-cell adhesion are spot desmosomes and hemidesmosomes.
c. macula adherens are linked to intermediate filaments. d. sterocilia have basal body. e. no correct answer.

11 - Gap junctions are:

a. composed of six subunits of cadherin. b. two micrometers in diameter.
c. present in neurons and skeletal muscle cells. d. hydrophilic channels. e. no correct answer.

12 - Actin filaments:

a. as microtubules, they are polarized. b. they are present in the nucleus.
c. they are involved in cytokinesis of plant cells d. they form networks in the cell cortex e. a and d are correct.

13 - Regarding microtubules:

a. the wall is made up of gamma tubulin. b. their negative end is directed towards the centriole.
c. their diameter is the smallest among all cytoskeleton components.
d. their only role is to form the spindle of division. e. b and d are correct.

14 - Intermediate filaments (IF):

a. monomers are globular. b. comprise lamins and keratins. c. comprise desmins and integrins.
d. diameter is 22 nm. e. b and d correct.

15 - The nucleus:

a. has an envelope made up of two lipid layers. b. communicates with the cytosol through porins.
c. contains a matrix of non-histone proteins responsible for chromatin distribution and nucleoplasm organization.

d. shows a dense region named nucleolus where translation of ribosomal proteins occurs e. no correct answer.

16 - Bacteria:

a. cell wall contains lipopolysaccharides in Gram positive bacteria. b. contain many circular chromosomes.
c. capsule is made up of peptidoglycans. d. capsule is made up of carbohydrates. e. no correct answer.

17 - DNA condensation:

a. first level involves four types of nucleosomal histones. b. is performed by helicases.
c. second level produces the 30 nm-chromatin fiber. d. a and c are correct. e. no correct answer.

18 - The rough endoplasmic reticulum (RER):

a. has a tubular structure. b. contains active proton pumps.
c. contains active hydrolases. d. contains RNA polymerases. e. contains disulfide isomerase.

19 - The smooth endoplasmic reticulum (SER):

a. is the site of N-glycosylation. b. is the site of steroid hormones synthesis c. is involved in glycogenolysis.
d. contains a Ca2+ concentration higher than that found in the cytosol. e. b and c are correct.

20 - Golgi apparatus:

a. is a set of dictyosomes whose number depends on cell's secretory activity. b. is responsible for intracellular digestion.
c. is not involved in polysaccharide synthesis. d. all of the above. e. no correct answer.

21 - Which of the following is <u>not</u> correct regarding Golgi apparatus?.

a. it performs O-glysosylation and glypiation.
b. the cis face is where proteins arrive from the RER. c. it is the site of maturation of lysosomal enzymes.
d. the cis cisternae contain enzymes different from those in the other cisternae e. none of the above.

22 - Lysosomes:

a. are involved in autophagy along with the SER b. their membranes contain ATPase pumps and permeases.
c. are enveloped by two membranes. d. are common to animals and plants e. a and b are correct.

23 - Peroxisomes:

a. are involved in oxidation of amino acids. b. are found in animal cells but not in plant cells.
c. are released from trans face of a dictyosome d. produce H2O2 by catalase and peroxidase e. no correct answer.

24 - Regarding ribosomes:

a. they attach to the RER membrane if the polypeptide being translated contains a signal peptide sequence.
b. three rRNA types are found in a eukaryotic ribosome while four types occur in a prokaryotic ribosome.
c. they are made up of several rRNA types and several protein types. d. a and b are correct. e. no correct answer.

25 - Regarding mitochondria:

a. it imports only some of its protein from the cytosol.
b. they self-replicate and they are not uniformly distributed in the cytoplasm.
c. respiratory chain proteins are present in the matrix. d. a and b are correct e. no correct answer.

26 - Regarding mitochondria:

a. the majority of ATP is generated by oxidative phosphorylation parallel to cell respiration.
b. F1 of ATP synthase is directed to the intermembrane space.
c. the respiratory chain consumes water and produces O2 d. all of the above e. no correct answer.

27 - Regarding chloroplasts:

a. ATP synthase is located in the inner chloroplast membrane.
b. thylakoid membrane contains chlorophyll and other pigments. c. the stroma contains linear DNA.
d. their ribosomes are the same as the cytosolic ones. e. photosynthesis occurs in all plastid types.

28 - Regarding mitosis:

a. it lasts usually longer than interphase. b. in the early prophase, kinetochore microtubules are formed.
c. during anaphase, polar microtubules will shorten. d. cytokinesis depends on intermediate filaments.
e. mitotic cyclins activate kinases which phosphorylate proteins responsible for chromatin condensation into chromosomes.

29 - Regarding plant cell vacuoles:

a. their membranes are called phragmoplasts. b. they may perform intracellular digestion.
c. they contain low water quantity. d. all of the above. e. no correct answer.

30 - The nucleolus:

c. comprises the gene that encodes the 5s RNA. d. transcribes the 45s RNA in the granular region.

a. is delimited by a membrane. b. contains DNA from a single chromosome. e. no correct answer.

31 - . . . . . is a polar mineral compound which can solubilize mineral salts by formation of ionic bonds.
32 - Two cysteine residues in an polypeptide chain may form a . . . . . bond to contribute to tertiary structure stability.
33 - A sexual . . . . . is made up of proteins and mediates conjugation of bacteria, which is the passage of a plasmid from a donor bacterium to a recipient one.
34 - The . . . . . is present outside the cell, in front of the plasma membrane of animal cells, and is responsible for functions such as endocytosis, cell-cell recognition, and protection of cells against proteolytic enzymes.
35 - A cell degrades damaged proteins (after they are tagged) by an enzymatic complex found in the cytosol and named . . . . . .
36 - . . . . . is the enzyme that transcribes the repeated gene which encodes the 45s RNA (a precursor of three rRNA types).
37 - . . . . . is an enzyme that belongs to the large ribosomal subunit and that catalyzes peptide bond formation during elongation of translation.
38 - The . . . . . cycle enzymes help a plant seed and seedling converting the stored lipids into glucose.
39 - The inner mitochondrial membrane does not contain cholesterol, but it contains a special phospholipid type named . . . . . .
40 - . . . . . are organelles rich in terpenes and they belong to the plastid family. They determine the color of certain plant organs such as the root, fruit, petals.