Cell Biology 38 questions

***Series A**: **<u>On the answer sheet</u>,** give **<u>two</u>** right answers for each question.*

1. **All cells:**
   A- are autonomous and form multicellular organisms. B- in a certain organ, are of the same type.
   C- have DNA either in a nucleus or in a nucleoid. D- contain DNA , RNA and ribosomes.
2. **ATP synthase belongs to the:**
   a- outer mitochondrial membrane b- Inner chloroplast membrane
   c- inner mitochondrial membrane d- thylakoid membrane
3. **The phragmoplast and tonoplast are relevant to …… and ……., respectively:**
   a- cytokinesis and endomembrane system. b- cell division and vacuole.
   c- cytoskeleton and chloroplast. d- cytokinesis and plastids.
4. **Regarding sorting and maturation by the endomembrane system, it is correct to say that:**
   a- The same address code occurs in diverse protein types that are directed to diverse organelles.
   b- N-glycosylation requires the enzymes glycosyl transferase and oligosaccharyl transferase.
   c- Vesicles that move material between the RER and TGN and CGN have the different coats.
   d- most budding of vesicles takes place at the cis-face of a dictyosome.
5. **A cross section of a cilium shows (inside the enclosing plasma membrane):**
   a - 9 peripheral microtubule doublets and 2 central actin filaments.
   b – 9 peripheral doublets of intermediate filaments.
   c – dynein arms linked to peripheral doublet of microtubule.
   d - 9 peripheral microtubules doublets in addition to 0, 1 or 2 central microtubules.
6. **Thin filaments:**
   A- are 8 micrometers in diameter.
   B- occur at the equatorial level of an animal cell as part of the contractile ring during cytokinesis.
   C- are made up of fibrous monomers.
   D- are cross-linked with one another by villin and fimbrin in microvilli.
7. **Connexons that form a gap junction are:**
   a – permanently opened channels. b - cadherins.
   c – composed of integral proteins spanning the bilayer of lipids. d –made up of six connexins each.
8. **The smooth endoplasmic reticulum:**
   a- is a set of flat reticulated sacks.
   b- contains detoxication enzymes named cytochromes P450.
   c- is abundant in cells that actively produce steroid hormones.
   d- contains glycosyl transferases.
9. **A triglyceride:**
   A- comprises 3 fatty acid molecules and one glycerol molecule. B- is a neutral molecule.
   C- added by a phosphate leads to a phosphatidic acid. D- comprises 3 phosphodiester bonds.
10. **Among the following molecules which ones are glycolipids?**
    A- gangliosides B- N-acetyl-glucosamine C- galactocerebroside D- chondroitin sulfate

***Series B**: **<u>On the answer sheet</u>,** give the **<u>unique</u>** right answer or fill in the blank with keywords.*

11. **Regarding bacteriophages, it is right to say that:**
    A- they cause human diseases.
    B- in the lysogenic strategy, they integrate their DNA in the cell's chromosome and start synthesizing their capsids.
    C- in the lytic strategy, they synthesize numerous copies of their DNA.
    D- they have lipid bilayers.
12. **Which of the following structure(s) is (are) common to eukaryotic and prokaryotic cells?**
    A- ribosomes and lysosomes. B- a cell wall composed of cellulose and peptidoglycans.
    C- plasma membrane obeying the fluid mosaic model. D- ribosomes and mitochondria.
13. **Saccharose is:**
    A- a monosaccharide

B- made up of glucose and galactose joined by a glycosidic bond.
C- made up of glucose and fructose linked by a peptide bond.
D- no correct answer.

14. Plant cells differ from animal cells by the presence of:

A- lysosomes, plasma membrane and chloroplasts
B- chloroplast, vacuole and cellulose-containing cell wall
C- plasma membrane, cell wall and centrosomes
D- chloroplast, vacuole and plasma membrane

15. Phosphatidylinositol:

A- is a phosphatidic acid comprising 3 fatty acids + Inositol.
B- is a saponifiable glycolipid.
C- is involved in intracellular signaling and signal transduction.
D- is a totally hydrophobic molecule.

16. Which of the following statements is correct?

A- Water is less abundant than organic compounds.
B- The mRNA class is more abundant than the tRNA class.
C- Eukaryotes have 4 tRNA types and about 34 rRNA types.
D- Transcription of genes produces several classes of RNA.

17. Regarding proteins, it is right to say that:

A- diversity of their primary structures is responsible for their diverse functions.
B- their folding into 3D structure always results in a globular shape.
C- a quaternary structure is always necessary.
D- always the disulfide bridge stabilizes the quaternary structure.

18. Regarding lysosomes and peroxisomes, which of the following statements is correct?

A – Both contain acid hydrolases including catalases and peroxidases.
B – Lysosomes and peroxisomes are both delimited by a lipid bilayer.
C – Lysosomes are involved in protein glycosylation.
D – They both occur in all eukaryotes.

19. In *Macula adherens* that occurs between neighboring cells, there are:

A- occludins.
B– anchored intermediate filaments made up of desmin.
C- integrins.
D– anchored actin filaments.

20. Which of the followings is (are) correct regarding histones?

A – Histones are negatively charged proteins.
B – H1 is a nucleosomal histone.
C – H1 is inside the nucleosome core
D – H1 mediates packing of nucleosomes into a 30nm fiber.

21. Mitochondria:

A – contain glycolysis enzymes.
B – have several linear DNA copies.
C – occur in a constant number per cell.
D – import most of their proteins from the cytosol.

22. The nucleolus:

A – is responsible for ribosomes production.
B – comprises the nucleolar organizing region.
C – is not delimited by a membrane.
D – All answers are correct.

23. Regarding lipids of the membrane, it is right to say that:

A – cholesterol is found in all eukaryotic cell membranes.
B – Glycolipids are abundant in the inner leaflet.
C – Unsaturated fatty acids promote membrane fluidity.
D – fluidity is unrelated to cholesterol.

24. The rough endoplasmic reticulum:

A – is not continuous with the nuclear envelope.
B – is the main site of steroid synthesis.
C – consists of piled discs named dictyososme.
D – contains an enzyme named disulfide isomerase.

25. Regarding mitosis, it is correct to say that:

A – chromatin condensation occurs during late prophase.
B– the spindle is made up of a single microtubule type.
C – nuclear lamina disassembles during anaphase.
D – no correct answer.

26. Among plastids there are:

A- amyloplast, chloroplast and phragmoplast
B- lycopene-containing chromoplasts in tomato.
C- Phragmoplast, chloroplast and amyloplast.
D- chromoplast, chloroplast and tonoplast.

27. …… and kinesins are motor proteins that are associated with microtubules.
28. The specialization in apical plasma membrane of enterocytes that makes absorption highly efficient is ……
29. Kinetochore is a complex of proteins that bind to the …….. of a chromosome.

30. - The protein complex that is responsible for import of mitochondrial proteins from the cytosol across the inner membrane is named .....
31. The branched homopolysaccharide, made up of glucose and specific to plant cells, is .....
32. ..... is the precursor of steroid hormones, vitamin D and bile acids.
33. The presence of cytoplasmic lamella in prokaryotes is characteristic of ..... bacteria.
34. A heteroprotein is named ..... if it contains an amino acid chain (polypeptide) linked to a lipid molecule.
35. The secondary structure of proteins is stable due to weak bonds named ..... bonds.
36. Amino acids are divided into four groups based on properties of their .....
37. Membrane of the ..... comprises the photosynthetic chain elements.
38. Membrane fluidity enables lateral diffusion of phospholipids as well as lateral diffusion of .....

Plant Histology (10 pts)

Choose the right answer:

1- The sieve tube is a differentiated cell: