


## **Contents:**

- 1.Chapter (1): Introduction to Cell biology**
- 2.Chapter (6): Controlling of Gene Expression**
- 3.Chapter (8): Cellular Membrane**
- 4.Chapter (9): Mitochondrion and Aerobic Respiration**
- 5.Chapter (11): The Extracellular Matrix and Cell Interactions**
- 6.Chapter (12): Cellular Organelles and Membrane Trafficking**
- 7.Chapter (13): The Cytoskeleton**
- 8.Chapter (15): Cell Signaling Pathways**

## **Resources:**

Karp's cell biology (8<sup>th</sup> Edition) text book.

**All right reserved to Karp's cell biology (8<sup>th</sup> Edition) text book**

" الله يراك وأنت تخوض المصاعب، وتتعرقل، وتتعثّر، ويكسر قلبك، وتناضل، وتحاول وتعود، الله شهيد على كلّ تنهيدة وجع، فلا تقلق " 

## CHAPTER-1

### Practice exam

(Past papers + Karp's test bank + suggested questions)

1) All of the following is true except?

- A) Leeuwenhoek used single lens microscopy to examine a drop of pond water.
- B) Hooke used double lens microscopy to examine pores inside cork cells.
- C) The discovery of cells followed from the invention of the microscope by Leewenhooke and Robert hoek.
- D) Cells are topic of intense study and it requires creative instruments to study it.
- E) All of the above is true.

Answer: (C)

2) Which of the following characteristics is (are) not a basic property of cells?

- A) Cells have plasma membrane, DNA and lysosomes.
- B) Cells engage in numerous mechanical activities.
- C) Cells generally respond to stimuli.
- D) Cells are capable of self-regulation.
- E) Cells evolve.

Answer: (A)

**3) The genetic material of a prokaryotic cell is present in a ..... region of the cell.**

- A) Genetome
- B) Chromatic region.
- C) Nucleus.
- D) Nucleoid.
- E) Pharmacopeia.

Answer: (D)

**4) Which of the following is not a model organism?**

- A) Mus musculus.
- B) Drosophila melanogaster.
- C) Homo sapiens.
- D) Arabidopsis thaliana.
- E) Caenorhabditis elegans.

Answer: (C)

**5) What is probably the single most important distinct between Prokaryotes and Eukaryotes?**

- A) The existence of Golgi complex.
- B) The separation of genetic material from the surrounding cytoplasm.
- C) The existence of ribosomes.
- D) The centrioles.
- E) The lysosomes and peroxisomes.

Answer: (B)

**6) Who was the first person to describe various forms of bacteria?**

- A) Robert Hooke.
- B) Schwann and Schleiden.
- C) Antonie van Leeuwenhoek.
- D) Peter.
- E) Theodor Schwan.

Answer: (C)

**7) Which of the following is a tenet of cell theory, as proposed by Theodor Schwann?**

- A) Cell can be seen with naked eyes.
- B) Only animals are composed of cells.
- C) Cell is the structural unit of life.
- D) Not all organisms have cells.
- E) None of the above.

Answer: (C)

**8) Rudolf Virchow, a German pathologist proposed the \_\_\_\_\_**

- A) Cell theory.
- B) First tenet of cell theory.
- C) Second tenet of cell theory.
- D) Third tenet of cell theory.
- E) None of the above.

Answer: (D)

**9) Which organelle is located at the basal end of epithelial cells lining the intestine?**

- A) Mitochondria.
- B) Nucleus.
- C) Golgi complex.
- D) Cilia.
- E) None of the above.

Answer: (A)

**10) In cellular division, one cell gives rise to two daughter cells containing equal volume. However such a case of regular division is not observed in \_\_\_\_\_**

- A) White blood cells
- B) Liver cells
- C) Oocytes
- D) Red blood cells

Answer: (C)

**11) The sum total of all the chemical reactions taking place inside the cell, represent the cell's**

- A) Metabolism.
- B) Catabolism.
- C) Anabolism.
- D) Regulation.
- E) Feedback circuits.

Answer: (A)

**12) Motor proteins help in regulation which activities in a cell?**

- A) Mechanical.
- B) Chemical.
- C) Physical.
- D) Thermal.
- E) None of the above.

Answer: (A)

**13) All of the following is false except?**

- A) Spirogyra filamentous fungi has the ability to make their own food.
- B) Spirogyra filamentous alga doesn't have the ability to make their own food.
- C) Spirogyra alga with ribbon-like chloroplast for photosynthesis.
- D) Spirogyra fungi with ribbon-like chloroplast for photosynthesis.
- E) All of the above is false.

Answer: (C)

**14) Which of the following is not true for both prokaryotic and eukaryotic cells?**

- A) Same composition of plasma membrane.
- B) Both contain shared metabolic pathways.
- C) Genetic information encoded in DNA with similar genetic code.
- D) Both contain Golgi apparatus for protein trafficking.
- E) None of the above.

Answer: (D)

**15) Which of the following is present in both prokaryotic and eukaryotic cells?**

- A) Proteasomes.
- B) Plasmids.
- C) Lysosomes.
- D) Peroxisomes.
- E) None of the above.

Answer: (A)

**16) Nitrogen fixation can be done by?**

- A) All prokaryotes.
- B) Certain cyanobacteria.
- C) Certain archaeobacteria.
- D) Certain viruses.
- E) None of the mentioned.

Answer: (B)

**17) Which is the main building block of cilia?**



- A) Tubulin.
- B) Nexin.
- C) Dyenin.
- D) Actin.
- E) None of the above.

Answer: (A)

**18) Which of the following statement is false?**

- A) Prokaryotes and Eukaryotes have similar apparatus for conservation of chemical energy as ATP.
- B) Prokaryotes and Eukaryotes have similar metabolic pathways.
- C) Prokaryotes and Eukaryotes have cytoskeletal filaments built of proteins similar.
- D) Prokaryotes and Eukaryotes use a microtubule – containing mitotic spindle that separates chromosomes.
- E) C+D

Answer: (D)

"اللَّهُمَّ إِنَّكَ الرَّحِيمُ الرَّحْمَنُ، فَاجْعَلْنَا فِي مَأْمِنٍ مِمَّا نَخَافُ،  
تَحِيظُنَا رَحْمَاتِكَ، وَتُغِيثُنَا بِرَحْمَتِكَ، تَطَوَّقْنَا رِعَايَتِكَ وَلُطْفِكَ مِنْ  
كُلِّ إِتْجَاهٍ وَفِي كُلِّ طَرِيقٍ، وَتَحْتَ كُلِّ سَقْفٍ، اللَّهُمَّ بَلِّ قُلُوبُنَا  
بَغِيثِ كَرَمِكَ، وَاجْعَلْهَا أَمْنَةً مُطْمَئِنَّةً، هَانئَةً، مُسْتَقْرَةً"  

## CHAPTER 6

### Practice Exam

(Past papers + Karp's testbank + Suggested questions)

1) Nucleoli function in synthesizing?

- A) rRNA.
- B) tRNA.
- C) miRNA.
- D) mRNA.
- E) None of the above.

Answer: (A)

2) All of the following is true except?

- A) The nuclear envelope is a structure that divides the nucleus from its cytoplasm.
- B) Nucleoplasm is the fluid where solutes are dissolved.
- C) The two nuclear membranes are fused at sites forming a nuclear pore.
- D) The inner surface of the nuclear envelope is lined by the nuclear lamina.
- E) All of the above is true.

Answer: (E)

**3) One of the following RNAs is not manufactured in the nucleus and transported to the cytoplasm.**

- A) miRNA.
- B) tRNA.
- C) rRNA.
- D) mRNA.
- E) None of the above.

Answer: (A)

**4) The NPC is composed of:**

- A) 20 Proteins.
- B) 15 Proteins.
- C) 30 Proteins.
- D) 10 Proteins.
- E) 40 Proteins.

Answer: (C)

**5) Which of the following statements is false?**

- A) Nuclear pores contain a doughnut-shaped structure called the nuclear pore complex (NPC).
- B) The NPC is static, as many of its proteins are replaced over a period of seconds to minutes.
- C) The NPC is composed of ~30 proteins called nucleoporins.
- D) The nuclear lamina supports the nuclear envelope and is composed of lamins.
- E) All of the above is true.

Answer: (B)

**6) Cytoplasmic proteins are targeted for the nucleus by:**

- A) NLS.
- B) NPC.
- C) RNP.
- D) NES.
- E) None of the above.

Answer: (A)

**7) All of the following is true except?**

- A) mRNAs, rRNAs, miRNAs, and tRNAs are synthesized in the nucleus and function in the cytoplasm or are modified in the cytoplasm and return to function in the nucleus.
- B) Only mature, fully processed mRNAs are capable of nuclear export, as an mRNA with an unspliced intron is retained in the nucleus.
- C) The largest human chromosome would extend 10 cm long.
- D) An average human cell contains about 4.6 billion base pairs of DNA divided among 46 chromosomes.
- E) All of the above is true.

Answer: (D)

**8) The linker histone is:**

- A) H1.
- B) H2A.
- C) H2B.
- D) H3A.
- E) H4B.

Answer: (A)

**9) DNA and Histones are held together by:**

- A) Covalent bonds.
- B) Ionic bonds.
- C) Hydrogen bonds.
- D) Non-covalent bonds.
- E) Disulfide bonds.

Answer: (D)

## CHAPTER 8

### Practice exam

(Past papers + Karp's testbank + Suggested questions)

1) Which of the following is a function of membranes?

- A) Mediates intracellular interactions.
- B) Selectively permeable barrier.
- C) Compartmentalization.
- D) Helps cells respond to external stimuli.
- E) All of the above.

Answer: (E)

2) What are the building blocks of a phosphoglyceride, specifically phosphatidic acid?

- A) Glycerol + 3 Fatty acids.
- B) Glycerol + 1 Phosphate group + 3 Fatty acids.
- C) Glycerol + 1 phosphate group + 2 Fatty acids.
- D) Glycerol + 2 Phosphate group + 1 Fatty acid.
- E) Glycerol + 1 Phosphate group.

Answer: (C)

3) What kind of membrane protein penetrates into the hydrophobic part of the lipid bilayer?

- A) Lipid-anchored protein.
- B) Galactocerebroside.
- C) Phosphatidylcholine.
- D) Peripheral proteins.
- E) Integral protein.

Answer: (E)

4) What directly or indirectly determines the transition temperature?

- A) The extent to which fatty acid chains of the lipids contain double bonds.
- B) Whether the fatty acid chains of the lipids are saturated or unsaturated.
- C) The ability of lipid molecules to be packed together.
- D) The length of the fatty acid chains.
- E) All of these are correct.

Answer: (E)

5) Which of the following lipids is found concentrated in lipid rafts in animal cell plasma membranes?

- A) Cholesterol.
- B) Phosphatidylinositol.
- C) Phosphatidylcholine.
- D) Phosphatidylethanolamine.
- E) Phosphatidylserine.

Answer: (A)

6) A channel that opens in response to changes in ionic charge across a membrane is called a?

- A) Ligand – gated channel.
- B) Positive – gated channel.
- C) Charge – gated channel.
- D) Voltage – gated channel.
- E) Electric – gated channel.

Answer: (D)

**7) The movement of water through a semipermeable membrane from a region of lower solute concentration to a region of higher solute concentration is called?**

- A) Osmosis.
- B) Solubility.
- C) Denaturation.
- D) Metabolism.
- E) Diffusion.

Answer: (A)

**8) Which of the following is an example of co-transport active transport?**

- A) Glucose permeable transport.
- B) O<sub>2</sub> diffusion across a membrane.
- C) Na<sup>+</sup>/glucose symport.
- D) Aquaporin water transport.
- E) Na<sup>+</sup>/K<sup>+</sup> ATPase.

Answer: (C)

**9) The Na<sup>+</sup>/K<sup>+</sup> ATPase pump actively moves?**

- A) 1 Na<sup>+</sup> out, 1 K<sup>+</sup> in.
- B) 3 Na<sup>+</sup> out, 2 K<sup>+</sup> in.
- C) 3 Na<sup>+</sup> in, 2 K<sup>+</sup> out.
- D) 2 Na<sup>+</sup> out, 3 K<sup>+</sup> in.
- E) 2 Na<sup>+</sup> in, 3 K<sup>+</sup> out.

Answer: (B)

**10) The specific molecules that bind to receptors are?**

- A) Ligands.
- B) Co-enzymes.
- C) Substrates.
- D) Enzymes.
- E) None of the above.

Answer: (A)

**11) According to the fluid mosaic model, the membrane is?**

- A) Rigid.
- B) Discontinuous.
- C) Sheet-like.
- D) Fluid-like.
- E) None of the above.

Answer: (D)

**12) The ..... the degree of unsaturation of the fatty acids of the bilayer, the ..... the temperature before the bilayer gels.**

- A) Greater. lower.
- B) Greater. more.
- C) Lesser. higher.
- D) Lesser, higher.
- E) None of the above

Answer: (A)

**13) Lipid rafts are patches of cholesterol and .....?**

- A) Carbohydrates.
- B) Amino acids.
- C) Lipids.
- D) Sphingolipids.
- E) Cerebroside.

Answer: (D)

**14) In the experiments to demonstrate the mobility of membrane proteins, which cells were fused with human cells?**

- A) Mouse cells.
- B) Drosophila cells.
- C) Tumor cells.
- D) Bacterial cells.
- E) Rat cells.

Answer: (A)



**15) Which phenomena are made use of in the technique FRAP?**

- A) Electrostatic.
- B) Photothermal.
- C) Hybridization.
- D) Fluorescence.
- E) None of the above.

Answer: (D)

**16) Hemolysis is associated with which type of cells?**

- A) Hepatocytes.
- B) Germ cells.
- C) Somatic cells.
- D) Red blood cells.
- E) None of the above.

Answer: (D)

**17) Band 3 and glycophorins are membrane proteins that contain?**

- A) Carbohydrates.
- B) Sterols.
- C) Lipids.
- D) Nucleic acids.
- E) None of the above.

Answer: (A)

**18) Transverse diffusion (flip-flop) is the movement of?**

- A) Cholesterol molecule.
- B) Amino acid.
- C) Protein.
- D) Phospholipid.
- E) Sphingolipids.

Answer: (D)

**19) The erythrocyte has a \_\_\_\_\_ shape?**

- A) Spherical.
- B) Convex.
- C) Concave.
- D) Bi-concave.
- E) Circular.

Answer: (D)

**20) The phosphoglycerides in cell membrane are of the \_\_\_\_\_ type.**

- A) Triglyceride
- B) Diglyceride
- C) Monoglyceride
- D) Polyglyceride
- E) None of the above.

Answer: (B)

**21) Sphingolipids is the derivative of \_\_\_\_\_?**

- A) Sphingosine.
- B) Sphingosin.
- C) Sphingosceramicin.
- D) Sphingolipid polymer.
- E) Cerebroside.

Answer: (A)

**22) Which of the following is not a component of cell membranes?**

- A) Phosphodiglycerides.
- B) Sphingolipids.
- C) Cholesterol.
- D) Phosphotriglycerides.
- E) None of the above.

Answer: (D)

**23) Which of the following is exoplasmic?**

- A) Phosphatidyl choline.
- B) Phosphatidyl serine.
- C) Phosphatidyl ethanolamine.
- D) Phosphatidyl inositol.

Answer: (A)

**24) Which of the following facilitates binding of positively charged amino acid residues?**

- A) Phosphatidyl choline (PC).
- B) Phosphatidyl serine (PS).
- C) Phosphatidyl ethanolamine (PE).
- D) Phosphatidyl inositol (PI).
- E) None of the above.

Answer: (B)

**25) Which of the following is covalently attached to a lipid molecule in cell membrane?**

- A) Integral protein.
- B) Transmembrane protein.
- C) Peripheral protein.
- D) Lipid-anchored protein.
- E) None of the above.

Answer: (D)

**26) The concept of transmembrane proteins was obtained from the results of which technique?**

- A) Freeze-fraction replication.
- B) Freeze-fracture replication.
- C) Fraction replication.
- D) None of the above.

Answer: (B)

**27) GPI- anchored proteins show particular affinity towards?**

- A) Cholesterol.
- B) Hydrophobic tail.
- C) Lipid rafts.
- D) Phosphatidylserine.
- E) None of the above.

Answer: (C)

**28) Antibody -coated gold particles are used in?**

- A) FRAP.
- B) SPT.
- C) X-ray crystallography.
- D) Cannot be determined.

Answer: (B)

**29) Which of the following channels depend on forces such as stretch tension applied on the membrane?**

- A) Voltage-gated channels.
- B) Mechano-gated channels.
- C) Ligand-gated channels.
- D) Tension-gated channels.
- E) None of the above.

Answer: (B)

**30) The ion most abundant in cells and most permeable to cell membrane is \_\_\_\_\_?**

- A)  $K^+$
- B)  $Ca^{2+}$
- C)  $Na^+$
- D)  $H^+$
- E)  $Cl^-$

Answer: (A)

**31) GLUT1 is an example of \_\_\_\_\_?**

- A) Channel protein.
- B) Facilitative transporter.
- C) Active transporter.
- D) Lipid-anchored protein.
- E) None of the above.

Answer: (B)

**32) Symport and Antiport is the classification of \_\_\_\_\_?**

- A) Primary active transport
- B) Secondary active transport
- C) Primary passive transport
- D) Secondary passive transport

Answer: (B)

## CHAPTER 9

### Practice exam

(Past papers + Karp's testbank + suggested questions)

1) Which of the following has the ability to oxidize very – long – chain fatty acid?

- A) Golgi complex.
- B) Smooth endoplasmic reticulum.
- C) Lysosomes.
- D) Peroxisomes.
- E) Late endosomes.

Answer: (D)

2) Inner mitochondrial membrane invaginated sheets, make.....?

- A) Pseudopodia.
- B) Cristae.
- C) Inner boundary membrane.
- D) Outer boundary membrane.
- E) Matrix.

Answer: (B)

3) Which of the following organelles has the ability to breakdown hydrogen peroxides?

- A) Lysosomes.
- B) Late endosomes.
- C) Peroxisomes.
- D) Mitochondria.
- E) Smooth endoplasmic reticulum.

Answer: (C)

4) Which of the following is not a function of mitochondria?

- A) Uptake of  $\text{Ca}^{+2}$  ions.
- B) Synthesis of heme group.
- C) Synthesis of certain amino acids.
- D) Synthesis of cholesterol.
- E) Release of  $\text{Ca}^{+2}$  ions.

Answer: (D)

**5) The inner boundary membrane and inner cristal membrane are joined by?**

- A) Mitochondrial junctions.
- B) Membrane junctions.
- C) Cristae junctions.
- D) Tubule junctions.
- E) None of the above.

Answer: (C)

**6) Which part of mitochondria has almost 70-75% protein content?**

- A) Outer membrane.
- B) Inner membrane.
- C) Both outer and inner membrane.
- D) Intermembrane space.
- E) Mitochondrial matrix.

Answer: (B)

**7) Cardiolipin present in inner mitochondrial membrane plays a role in?**

- A) Formation of the respiratory mechanisms.
- B) Activation of proteins involved in Glycolysis.
- C) Activation of proteins involved in electron oxidation.
- D) Activation of proteins.
- E) None of the above.

Answer: (C)

**8) Porins are present in?**

- A) Inner membrane.
- B) Outer membrane.
- C) Intermembrane space.
- D) Both inner and outer membrane.
- E) All of the above.

Answer: (D)

**9) The mitochondrial DNA in humans encode for how many poplypeptides?**

- A) 15
- B) 13
- C) 12
- D) 11
- E) 17

Answer: (B)

**10) Which genetic disorder is associated with dysfunction of peroxisomes?**

- A) Parkinson's disease.
- B) Down's syndrome.
- C) Zellweger Syndrome.
- D) Bubble Boy Syndrome.
- E) None of the above.

Answer: (C)

**11) Which organelle is used in the production of white matter in the nervous system?**

- A) Mitochondria.
- B) Peroxisomes.
- C) Endoplasmic Reticulum.
- D) Ribosomes.
- E) None of the above.

Answer: (B)

" لا تيأس إذا رجعت خطوة للوراء، فلا تنسى أن السهم يحتاج أن ترجعه للوراء لينطلق بقوة إلى الأمام " 🥰❤️

CHAPTER 11

Practice exam

(Past papers + Karp's testbank + Suggested questions)

1) What is not a function of extracellular matrix of animal cells?

- A) Cell differentiation.
- B) Cell division.
- C) Cell motility.
- D) DNA replication.
- E) Cell adhesion.

Answer: (D)

2) Focal adhesion .....

- A) Contain integrins that develop transient interaction with the extracellular matrix.
- B) Transmit information to the cell interior that may lead to changes in cell adhesion, proliferation or survival.
- C) Collect information about the chemical properties of the extracellular environment.
- D) Have been implicated in cell adhesion.
- E) All of these are correct.

Answer: (E)

3) Which of the following mediate the interactions between leukocytes and blood vessel endothelial cells?

- A) Calmodulins.
- B) Cadherins.
- C) Immunoglobulin superfamily proteins.
- D) Selectins.
- E) Focal adhesion.

Answer: (D)

4) The degradation of the extracellular matrix, along with cell surface proteins, is accomplished mostly by a ..... Containing enzyme family called.....?

- A) Copper, MMPs.
- B) Magnesium, matrix metalloproteinases.
- C) Zinc, matrix metalloproteinases.
- D) Copper, matrix metalloproteinases.
- E) Manganese, MMPs.

Answer: (C)

**5) What substances joins proteoglycans together into gigantic complexes called proteoglycan aggregates?**

- A) Hyaluronic acid.
- B) Fibronectin.
- C) Hyaluronidase.
- D) Proteoglycans.
- E) Laminin.

Answer: (A)

**6) What is the key role of Chondroitin sulfate proteoglycans?**

- A) Extracellular matrix interaction.
- B) Protection to cell.
- C) Production of proteins.
- D) Digesting the toxins.
- E) None of the above.

Answer: (A)

**7) What is the key role of fibroblasts?**

- A) Protecting the cell.
- B) Producing extracellular matrix.
- C) Producing lytic enzymes.
- D) Providing structure.
- E) None of the above.

Answer: (B)

**8) Which of the following disease is associated with the disruption of hemidesmosomes?**

- A) Atherosclerosis.
- B) Epidermolysis bullosa.
- C) Myocardial infarction.
- D) Zellweger syndrome.
- E) None of the above.

Answer: (B)

**9) What is the range of amino acids present in an immunoglobulin molecule?**

- A) 50-110.
- B) 70-110.
- C) 60-110.
- D) 80-110.
- E) 90-110.

Answer: (B)

**10) What ions is required for the function of cadherins?**

- A)  $\text{Ca}^{2+}$
- B)  $\text{Na}^+$
- C)  $\text{K}^+$
- D)  $\text{H}^+$
- E)  $\text{Cl}^-$

Answer: (A)

**11) Which of the following filaments bind to the cadherin and catenin complex?**

- A) Myosin.
- B) Actin.
- C) Globulin.
- D) Albumin.
- E) Tubulin.

Answer: (B)

**12) Macula adhaerens?**

- A) Adheren junction.
- B) Plasmodesmata.
- C) Cadherins.
- D) Desmosomes.
- E) Gap junctions.

Answer: (D)

**13) Which of the following proteins are abundant in the extracellular matrix?**

- A) Actin.
- B) Myosin.
- C) Collagen.
- D) Tubulin.
- E) None of the above.

Answer: (C)

**14) Which of the following is correct about integrins?**

- A) They facilitate integration of foreign DNA into a host genome by homologous recombination.
- B) They synthesize fibronectin, vitronectin, collagen, and laminin.
- C) They promote conjugative pili firing through motile force during bacterial conjugation.
- D) They anchor the cell to the extracellular matrix (ECM) and relay signals from the ECM to the cell.
- E) None of the above.

Answer: (D)

**15) All of the following is true except?**

- A) The glycocalyx mediates cell-cell and cell-substratum interactions.
- B) The glycocalyx mediates mechanical protection to cells.
- C) The glycocalyx serves as a barrier to particles moving toward the plasma membrane.
- D) The glycocalyx binds important regulatory factors that act on the cell surface.
- E) Lipid projections form part of the glycocalyx.

Answer: (E)

**16) Basement membrane?**

- A) Serve as a barrier to invasion of tissues by cancer cells.
- B) Kidney failure in long-term diabetics may result from an abnormal thickening of the basement membranes surrounding the glomeruli.
- C) Serve as a substratum for cell migration.
- D) A+B.
- E) All of the above.

Answer: (E)

**17) Which of the following statements is false?**

- A) Most proteins inside cells are fibrous, while those in the ECM are globular.
- B) Collagen is produced by myoblasts.
- C) Myosin is the single most abundant protein in the human body.
- D) A+B.
- E) All of these statements are false.

Answer: (E)

**18) Collagen molecules are ..... ?**

- A) Trimers.
- B) Contain large amount of proline.
- C) Type I, II, and III collagens are fibrillar.
- D) Rod-like triple helix.
- E) All of the above.

Answer: (E)

**19) One of the following is not a component of Extracellular matrix?**

- A) Collagen.
- B) Proteoglycans.
- C) Laminin.
- D) Fibrinogen.
- E) All of the above are components of Extracellular matrix.

Answer: (D)

**20) Which of the following is not true about integrins?**

- A) Integrins are a family of membrane proteins found only in animals.
- B) Integrins are composed of two membrane-spanning polypeptide chains, an  $\alpha$  chain and a  $\beta$  chain, that are covalently linked.
- C) The bent conformation of integrin corresponds to its inactive state, incapable of binding a ligand.
- D) Integrins can transmission of signals between the external environment and the cell interior.
- E) All of the above statements are true.

Answer: (B)

**Practice exam**

**(Past papers + Karp's testbank + Suggested questions)**

**1) Which of the following does represent the most likely secretory pathway for a protein after it has been completely synthesized?**

- A) RER – secretory vesicle – Golgi – environment.
- B) RER – Golgi – secretory vesicle – environment.
- C) Cytoplasm – RER – Golgi - secretory vesicle – environment.
- D) SER – Golgi – secretory vesicle – environment.
- E) RER – Golgi – SER – cytoplasm – environment.

Answer: (B)

**2) Each of the following is a smooth endoplasmic reticulum function except?**

- A) Synthesis of steroids.
- B) Sequestration of calcium  $\text{Ca}^{+2}$  ions within the cisternal space.
- C) Release of glucose into the blood stream.
- D) Synthesis of heme group.
- E) Detoxification of many organic compounds like barbiturates and ethanol.

Answer: (D)

**3) What does appear to be the purpose of molecular chaperons like BiP?**

- A) They recognize and bind to unfolded or misfolded DNAs and help them attain their native structure
- B) They recognize and bind to unfolded or misfolded proteins and help them attain their native structure.
- C) They recognize and bind to unfolded or misfolded RNAs and help them attain their native structure
- D) They transport secretory proteins into secretory vesicles.
- E) They recognize and bind to unfolded or misfolded carbohydrates and help them attain their native structure.

Answer: (B)

**4) On which of the following intracellular locations does clathrin organize a coat and form vesicles?**

- A) Endoplasmic network.
- B) Lysosomes.
- C) Trans – Golgi complex.
- D) Inner mitochondrial membrane.
- E) Regulated secretory vesicles.

Answer: (C)



**5) Which coated vesicles move materials in an anterograde direction from the ER and ERGIC forward toward the Golgi stack?**

- A) COPII – coated vesicles.
- B) Clathrin – coated vesicles.
- C) Cadmium – coated vesicles.
- D) COPI – coated vesicles.
- E) Both COPII and COPI.

Answer: (A)

**6) What is the arrangement of organelles in a secretory cell from the basal end to the apical end?**

- A) SER – nucleus and RER – secretory vesicles – Golgi complex – environment.
- B) Secretory vesicles – nucleus and RER – SER – Golgi complex – environment.
- C) RER – Golgi complex – secretory vesicles – environment.
- D) Nucleus and RER – Golgi complex – SER – secretory vesicles – environment.
- E) Golgi complex – RER – secretory vesicles – environment.

Answer: (C)

**7) What is responsible for transferring the oligosaccharide chain from lipid carrier to specific asparagine residues?**

- A) Membrane – bound glycosyltransferases.
- B) Glycosylsynthetase.
- C) Peptidyltransferase.
- D) Membrane – bound oligosaccharyltransferase.
- E) Membrane – bound gangliosidase.

Answer: (D)

**8) What of the following molecules is not transported through the secretory pathway of endomembrane system?**

- A) Nucleic acids.
- B) Complex polysaccharides.
- C) Proteins.
- D) Lipids.
- E) None of the above.

Answer: (A)

**9) In mammalian cells, the signal recognition particle (SRP) consists of \_\_\_\_ distinct polypeptides and one small RNA molecule?**

- A) 2
- B) 4
- C) 6
- D) 8
- E) 10

Answer: (C)

**10) Translocon is a?**

- A) Polypeptide.
- B) Protein channel.
- C) Receptor.
- D) Recognition particle.
- E) None of the above.

Answer: (B)

**11) Which of the following enzyme present in the rough endoplasmic reticulum removes the signal sequence from nascent polypeptides?**

- A) Signal oxidase.
- B) Signal peptidase.
- C) Oligosaccharyltransferase.
- D) Luciferase.
- E) None of the above.

Answer: (B)

**12) Cis-Golgi network (CGN) is closer to the endoplasmic reticulum than the trans-Golgi network (TGN).**

- A) True.
- B) False.

Answer: (A)

**13) Which protein families do not mechanically support the Golgi complex?**

- A) Keratin.
- B) Actin.
- C) Spectrin.
- D) Ankyrin.
- E) None of the above.

Answer: (A)

**14) Which of the following is not completely synthesized in the Golgi complex of a cell?**

- A) Pectins.
- B) Hemicellulose.
- C) N-linked oligosaccharides.
- D) O-linked oligosaccharides.
- E) None of the above.

Answer: (C)

**15) What is responsible for the transport of materials from the *cis* cisternae to the *trans* cisternae of the Golgi complex?**

- A) Active diffusion.
- B) Passive diffusion.
- C) Translocon.
- D) Transport vesicles.
- E) None of the above.

Answer: (D)

**16) COPII-coated vesicles move the materials from \_\_\_\_\_ to \_\_\_\_\_?**

- A) ERGIC, Golgi complex.
- B) Golgi complex, ERGIC.
- C) ER, Golgi complex.
- D) Golgi complex, ER.
- E) None of the above.

Answer: (C)

**17) COPI-coated vesicles move the materials in \_\_\_\_\_ direction?**

- A) Retrograde.
- B) Anterograde.
- C) Radial.
- D) Lateral.
- E) Medial.

Answer: (A)

**18) Retrieval signals, present on the C-terminus of ER resident proteins are captured by the receptors present on?**

- A) Clathrin-coated vesicles.
- B) Golgi complex.
- C) COPI-coated vesicles.
- D) COPII-coated vesicles.
- E) None of the above.

Answer: (C)

**19) Clathrin present on the clathrin-coated vesicles is a?**

- A) Carbohydrate.
- B) Protein.
- C) Oligosaccharide.
- D) Enzyme.
- E) Lipid.

Answer: (B)

**20) Which state of the 'Rabs' is the active state?**

- A) GDP-bound.
- B) GTP-bound.
- C) Membrane-bound.
- D) Lipid-bound.
- E) None of the above.

Answer: (B)

**21) Which of the following is a type of endocytosis?**

- A) Pinocytosis.
- B) Phagocytosis.
- C) Hemolysis.
- D) Cytogenesis.
- E) A+B.

Answer: (A)

**22) The process in which cell uptakes extracellular material bound to cell surface receptors is known as?**

- A) Phagocytosis.
- B) Pinocytosis.
- C) Receptor-mediated endocytosis.
- D) Bulk-phase endocytosis.
- E) None of the above.

Answer: (C)

**23) Receptor-mediated endocytosis (RME) leads to the formation of \_\_\_\_\_ coated pits.**

- A) Clathrin.
- B) Lipid.
- C) Lysosome.
- D) Mannose.

Answer: (A)

**24) A molecule of clathrin has a \_\_\_\_\_ structure?**

- A) Triskelion.
- B) Spherical.
- C) Cylindrical.
- D) Polygonal.

Answer: (A)

**25) Which adaptor molecule operate in clathrin-mediated endocytosis?**

- A) GGA
- B) AP1
- C) AP2
- D) Sar1

Answer: (C)

**26) Following internalization, vesicle-bound materials are transported to?**

- A) Nucleus.
- B) Peroxisomes.
- C) Lysosomes.
- D) Endosomes.

Answer: (D)

**27) Late endosomes are located near the?**

- A) Membrane.
- B) Nucleus.
- C) Mitochondria.
- D) Peroxisomes.
- E) None of the above.

Answer: (B)

Momen Tamimi

## Practice exam

## (Past papers + Karp's testbank + Suggested questions)

**1) Which type of cytoskeletal elements is characterized as a hollow, rigid cylindrical tube with walls composed of tubulin subunit?**

- A) Minitubules.
- B) Intermediate filaments.
- C) Microfilaments.
- D) Microtubules.
- E) All of the above.

Answer: (D)

**2) Structures that moves from the cell body of a neuron down the axon toward the neuron terminals are said to move in a(n) ..... direction?**

- A) Astronomical.
- B) Radial.
- C) Retrograde.
- D) Intergrade.
- E) Anterograde.

Answer: (E)

**3) Which of the following molecular motors is associated with microfilaments?**

- A) Dyneins.
- B) Myosins.
- C) Kinesins and dyneins.
- D) Kinesins and myosins.
- E) Kinesins.

Answer: (B)

**4) What is the name of the lightly staining areas at the outer edges of a sarcomere?**

- A) H zone.
- B) I bands.
- C) A bands.
- D) Z lines.
- E) M lines.

Answer: (B)

**5) Which type of actin – binding proteins is known to decrease cytoplasmic viscosity by breaking existing actin filaments into two or more pieces?**

- A) End – blocking proteins.
- B) Filament – severing proteins.
- C) Cross – linking proteins.
- D) Monomer – polymerizing proteins.
- E) Actin – filament depolymerizing proteins.

Answer: (B)

**6) Which type of cytoskeletal elements is described as tough, ropelike fibers composed of a variety of related proteins?**

- A) Indeterminate filaments.
- B) Macrofilaments.
- C) Microtubules.
- D) Microfilaments.
- E) Intermediate filaments.

Answer: (E)

**7) Which of the following molecular motors in known to travel in a retrograde direction along microtubules?**

- A) Myosins.
- B) Dyneins.
- C) Kinesins and dyneins.
- D) Kinesins and myosins.
- E) Kinesins.

Answer: (B)

**8) Which of the following are found only in animal cells?**

- A) Intermediate filaments.
- B) Microtubules.
- C) Nucleus.
- D) Microfilaments.
- E) Ribosomes.

Answer: (A)

**9) The drug colchicine promotes microtubule?**

- A) Disassembly.
- B) Assembly.
- C) Acidification.
- D) Condensation.
- E) None of the above.

Answer: (A)

**10) Which motor protein superfamily does not move along the microtubules?**

- A) Dynein.
- B) Kinesin.
- C) Myosin.
- D) Calmodulin.
- E) None of the above.

Answer: (C)

**11) In an axon, microtubules are oriented with their \_\_\_\_\_ facing the cell body?**

- A) Plus end.
- B) Minus end.
- C) Vertical axis.
- D) Periphery.
- E) None of the above.

Answer: (B)

**12) Intermediate filaments are?**

- A) Heterogenous.
- B) Homogenous.
- C) Labile.
- D) Weak.
- E) None of the above.

Answer: (A)

**13) The type V intermediate filaments are called?**

- A) Lamins.
- B) Collagen.
- C) Lignin.
- D) Fibrin.
- E) None of the above.

Answer: (A)

**14) The head of the myosin binds the?**

- A) ATP.
- B) ADP.
- C) Actin filament.
- D) Neurofilament.
- E) None of the above.

Answer: (C)

**15) The striated appearance of muscle fibers is due to?**

- A) Nucleus.
- B) Sacromeres.
- C) Sarcoma.
- D) Myoblasts.
- E) None of the above.

Answer: (B)

16) \_\_\_ of the sarcomere remains unaffected during the muscle contraction?

- A) H zone.
- B) A band.
- C) I band.
- D) H band.
- E) None of the above.

Answer: (B)

17) Each tropomyosin is associated with \_\_\_\_\_ subunits of actin subunits.

- A) 2
- B) 3
- C) 7
- D) 9
- E) 10

Answer: (C)

18) Troponin is composed of \_\_\_\_\_ subunits.

- A) 1
- B) 2
- C) 3
- D) 4
- E) 6

Answer: (C)

19) Which of the following prevents sarcomeres from pulling apart during muscle stretching?

- A) Titin.
- B) Vimentin.
- C) Myosin.
- D) Actin.
- E) Troponin.

Answer: (A)

Momen Tarnimi

## Practice exam

## (Past papers + Karp's testbank + Suggested questions)

1) The binding of glucagon to its receptor on skeletal muscle cells will cause, Except?

- A) Activate adenylyl cyclase.
- B) Activates a  $G_s$  (alpha) – protein.
- C) Increase intracellular  $Ca^{+2}$ .
- D) Activates a  $G_i$  (alpha) – protein.
- E) Increase cAMP.

Answer: (D)

2) Which intracellular proteins contain SH2 domains?

- A) Ras protein.
- B) GPCR.
- C) RTK.
- D) RTK – linked adaptor proteins.
- E) Sos.

Answer: (D)

3) Protein kinase A, Except?

- A) Inhibits glycogen synthase.
- B) Activates glycogen phosphorylase kinase.
- C) Phosphorylate glycogen synthase.
- D) Activates glycogen synthesis and breakdown.
- E) Is activated by cAMP.

Answer: (A)

4) Which enzyme is inhibited by cAMP?

- A) Glycogen phosphorylase kinase.
- B) Phosphorylate glycogen synthase.
- C) Glycogen synthase.
- D) Protein kinase A (PKA).
- E) Glycogen phosphorylase.

Answer: (D)

5) SOS:

- A) Is a G protein – coupled receptor.
- B) Activates Ras.
- C) Activates Raf (kinase).
- D) Is related to RTK signaling pathway.
- E) B+D.

Answer: (E)

6) Where the  $Ca^{+2}$  released into the sarcoplasm by inositol 1,4,5 – triphosphate comes from?

- A) Lysosomes.
- B) Mitochondria.
- C) The SER.
- D)  $Ca^{+2}$  calmodulin complexes.
- E) Extracellular to intracellular.

Answer: (C)

7) In which type of signaling, the cell that expresses messenger molecules also produces receptors?

- A) Autocrine.
- B) Heterocrine.
- C) Paracrine.
- D) Endocrine.

Answer: (A)

8) Protein kinases and phosphatases act by altering \_\_\_\_\_ of the signaling proteins?

- A) Basicity.
- B) Conformation.
- C) Acidity.
- D) Size.

Answer: (B)



**9) To which of the following residues of the protein, the protein kinases do not add phosphate groups?**

- A) Serine.
- B) Cytosine.
- C) Threonine.
- D) Tyrosine.
- E) None of the above.

Answer: (B)

**10) The process by which extracellular messages translate into intracellular changes is termed?**

- A) Cell signaling.
- B) Cell adhesion.
- C) Signal transduction.
- D) Cell transformation.
- E) None of the above.

Answer: (C)

**11) Which messenger molecules are derived from arachidonic acid?**

- A) Eicosanoids.
- B) Terpenoids.
- C) Corticoids.
- D) Steroids.
- E) A+D.

Answer: (A)

**12) On the cytoplasmic site of GCPRs, the G-proteins bind to?**

- A) Amino-terminus.
- B) Promoter region.
- C) Second loop.
- D) Third loop.
- E) None of the above.

Answer: (D)

**13) The inactive conformation of a G-protein coupled receptor is stabilized by?**

- A) Covalent interactions.
- B) Hydrogen binding.
- C) Non-covalent interactions.
- D) Ionic interactions.
- E) None of the above.

Answer: (C)

**14) Desensitization is the process of blocking receptors from turning on?**

- A) G-proteins.
- B) Transcription factors.
- C) Promoters.
- D) Activators.
- E) RTK.

Answer: (A)

**15) The Cholera toxin produced by *Vibrio cholera* exerts its effect by?**

- A) Modifying G-protein.
- B) Modifying primary messengers.
- C) Modifying effectors.
- D) Modifying receptors.
- E) Modifying Sos.

Answer: (A)

**16) Bringing 2 kinase domains in close contact allows for?**

- A) Trans-autophosphorylation.
- B) Cis-autophosphorylation.
- C) Inactivation of one domain.
- D) Inactivation of both domains.
- E) None of the above.

Answer: (A)

**17) When the levels of glucose drop, alpha-cells in the pancreas secrete?**

- A) Glucose.
- B) Glucagon.
- C) Starch.
- D) Pancreatic fluid.
- E) Insulin.

Answer: (B)

**18) Cytokines serve as \_\_\_\_\_ for apoptosis?**

- A) Internal stimuli.
- B) External stimuli.
- C) Inhibitors.
- D) Substitutes.
- E) None of the above.

Answer: (B)

**19) Which of the following is an extracellular messenger of apoptosis?**

- A) Serine.
- B) Tumor necrosis factor.
- C) Ribozyme.
- D) Translation inhibitor.
- E) Cytochrome c.

Answer: (B)

**20) Which of the following is involved in the intrinsic pathway of apoptosis?**

- A) cytochrome a.
- B) cytochrome b.
- C) cytochrome c.
- D) cytochrome d.
- E) None of the above.

Answer: (C)

**21) Apoptotic bodies can be recognized by the presence of \_\_\_\_\_ on the surface?**

- A) Phosphatidylserine.
- B) Phosphatidylcholine.
- C) Phosphatidylinositol.
- D) Phosphatidyltyrosine.
- E) Phosphatidylethanolamine.

Answer: (A)

**22) Inactivation of which of the following leads to shrinkage of the nucleus?**

- A) Lamin.
- B) Tubulin.
- C) Actin.
- D) Gelsolin.
- E) None of the above.

Answer: (A)

**23) Which of the following is not a disease related to reduced or elevated apoptosis?**

- A) Alzheimer's.
- B) Parkinson.
- C) Diabetes type II.
- D) Huntington's diseases.
- E) None of the above.

Answer: (C)

**24) Which of the following is not a second messenger?**

- A)  $Ca^{+2}$ .
- B) Nitric oxide.
- C) Diacylglycerol.
- D) cGMP.
- E) All of the above are second messengers.

Answer: (E)

\_ بارتداء احلامنا، ها هو الحلم اصبح حقيقة لاشيء يصف  
شعور ان يرتدي الانسان حلمه 🤝❤️.

﴿فَعَلِمَ مَا فِي قُلُوبِهِمْ فَأَنْزَلَ السَّكِينَةَ عَلَيْهِمْ﴾ 🤝❤️.