University of Sadat City	Academic Year:	2017-2018	Course Code:	(A-49)	Percentage	60%	GEBRI
			Academic Program:	(Diploma)	N. of Exam Paper		
	Level:	1st term	Department:	Molecular Biology	Date:		
	Course Name:	Human Cell Biology	Total score:	60	Time allowed:	3h	

Instructions of Exam:

Answer the obligatory questions.

1. Use the blue pen and pencil in answer sheet
2. Allow one sheet answer for every student
3. Is not allowed to borrow the tools (pen, pencils, drawing tools, calculator …etc)
4. Is not allowed to use the cell phone or any of its application during the time of exam

Answer the following questions

First Question **Total score (10)**

Choose the correct answer:

1-What is facilitated diffusion?

A) The movement of a particle down a concentration gradient helped by active pumping.
B) The movement of a particle up a concentration gradient helped by active pumping.
C) The passive movement of a particle across a cell membrane via a channel protein.
D) The passive movement of a particle through the phospholipid bilayer of the cell membrane.

2-In a human cell at prophase I, there are _____ tetrads

A) 92 B) 46 C) 23 D) 2 E) 4

3) How many hydrogen bonds form between U and A base pair interactions?

A) 0 B) 1 C) 2 D) 3 E) 4

4- The antisense strand is the strand from which the RNA is actually transcribed. It is also termed as:

A) The template strand B) The coding strand C) The sense strand

5- DNA ligase does which of the following

A) Joins Okazaki fragments on the lagging strand B) Catalyzes DNA replication
C) Enhances transcription D) methylates DNA

6- Which of the following is not a component of a nucleotide?

A) Phosphate group B) Anti-codon C) Ribose sugar D) Nitrogen base

7- Which is a characteristic of mitochondria?

A) Contain endoplasmic reticulum B) contain DNA molecule C) contain Golgi bodies

8- If cells are immersed in distilled water, the resulting movement of water into the cells is called

A) Facilitated diffusion B) active transport C) transpiration D) osmosis

9- Peroxisomes

A) Contain oxidative enzymes
B) Usually larger than lysosomes.
C) Produce and decompose hydrogen peroxide (H2O2)
D) All the above

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Staff Course	Dr. Hany Khalil Dr. Salwy Morsy	Department Head	Prof. Dr. Ibrahim Helmy

10-Ribosomes

A) Found in all cells, prokaryotic and eukaryotic

B) Made of ribosomal RNA and proteins

C) Some free in cytoplasm &some attached to ER D) All the above

Second Question

Total score (10)

Tick right (√)or wrong (×) with correct :

1-Homologs separate in meiosis II and therefore different alleles separate

2- Characteristics of mtDNA are circular, double stranded, super coiled, has histones.

3- Membranes rich in unsaturated fatty acids are more fluid than those rich in saturated fatty acids

4- At cool temperatures, cholesterol restrains movement of phospholipids, at warm temperatures; it maintains fluidity by preventing tight packing.

5- Nonpolar, hydrophobic molecules diffuse directly through the lipid bilayer but polar, hydrophilic substances cannot pass directly through the lipid bilayer.

6-Sodium and glucose are co-transported across the apical membrane of the intestinal epithelial cells. While the sodium ion gradient is genreated and maintained by the sodium-proton ATPase

7-The antibiotic valinomycin increases sodium ion transport across biological membranes.

8-The relative diffusion rate of the molecules across the bilayer is proportional to the concentration gradient across it.

9-Receptor-mediated endocytosis is a nonspecific macromolecule uptake process

10-Oxygen, Carbon diosxide and small relatively hydrophobic molecules can cross the phospholipid bilayer membrane unaided by a transport protein.

Third question

Total score (10)

Explain briefly with the drawing the following facts:

a- Crossing-over between synapsis.

b- Hydrochloric acid secretion by parietal cells in the stomach.

Fourth question

Total score (20)

Explain with drawing the following cellular processes:

a- DNA replication by Okazaki fragments

b- Transcription process.

c- Splicing process

d- Cellular communication

e- Paracrine and endocrine signaling

Fifth question

Total score (10)

a- Band 3 protein doesn't allow anions to flow un-directionally from one side of the erythrocyte membrane to the other. Explain with illustration of its role either in systemic or pulmonary capillaries.

b- Glucose is a good example of transport catalyzed by transporters. Discuss how these transporters resemble enzymes when catalyzing a chemical reaction and how the concentration gradient of glucose is maintained across the erythrocyte membrane.

Good Luck & Best wishes.....

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