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|  University of Sadat City | Academic Year: | 2017-2018 | Course Code: | (B1-28) | Percentage | 60% |  GEBRI |
| | | | Academic Program: | (M. SC) | N. of Exam Paper | | |
| | Level: | 1 st term | Department: | Molecular Biology | Date: | 9/1/2017 | |
| | 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

Choose the correct answer:

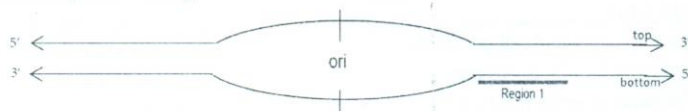
Total score (10)

1- Gametes results of Meiosis have

A) Homologous chromosomes. B) Twice the number of chromosomes found in body cells. C) Two sets of chromosomes. D) One allele for each gene.

2-Consider the following origin of replication that is found on a chromosome.

The sequence of region 1 is shown below.



Region 1: 5'...CTGACTGACA...3'

3'...GACTGACTGT...5'

2-1) Within region 1 which strand will be the template for leading strand synthesis?

A) The top 5'...CTGACTGACA...3'

B) The bottom 3'...GACTGACTGT...5'

2-2) if we assume that a lagging strand fragment is made from region 1, what will be its sequence?

A) 5'...CTGACTGACA...3' B) 5'...TGTCAGTCAG...3' C) 3'...GACTGACTGT...5'

D) 3'...TGTCAGTCAC...5'

3- What is the name of the enzyme responsible for add the specific amino acid to the correct tRNA in an ATP dependent charging reaction?

A) Guanyl transferase B) Polymerase C) Helicase D) Aminoacyl-tRNA synthetase

4- DNA is replicated:

A) Conservatively B) distributively C) Semi-conservatively D) dispersively

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|------------------------|---------------------------------------|-----------------------|---------------------|
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| Staff Course | Dr. Hany Khalil Dr. Salwa El-sayed | Department Head | Prof. Ibrahim Helmy |

5- Adenine and guanine are examples of what class of nitrogen base?

- A) Large B) Pyrimidines C) Small D) Purines

6- Which of the following deoxyoligonucleotides will hybridize with a DNA containing the sequence (5') TGACTGGTG (3')?

- A) (5') CACCAGTCA (3') B) (5') GACCAGTCT (3') C) (5') CTCATTGAG (3')
D) (5') TCTGACCAG (3') E) (5') TCTGGATCT (3')

7- Eukaryotic chromosomes consist of:

- A) Circular DNA molecules complexes with positively charged nonhistone proteins.
B) Circular DNA molecules complexes with negatively charged histone proteins.
C) Linear DNA molecules complexes with positively charged histone proteins.
D) Linear DNA molecules complexes with negatively charged histone proteins.

8- Which of the following is the role of the lysosome?

- A) ATP synthesis B) intracellular digestion C) lipid transport D) carbohydrate storage

9- IN Mitochondria 3 major pathways involved in ATP production

- A) Glycolysis – cytoplasm, Krebs cycle – matrix, Electron transport system -intermembrane space
B) Glycolysis – matrix, Krebs cycle – cytoplasm, Electron transport system -intermembrane space
C) Glycolysis – intermembrane space, Krebs cycle – matrix, Electron transport system -cytoplasm

10-Phospholipids


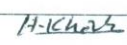
- A) Fatty acid tails hydrophobic, Phosphate group head hydrophilic
B) Fatty acid tails hydrophilic, Phosphate group head hydrophobic
C) Fatty acid tails hydrophobic, Phosphate group head hydrophobic

Second Question

Tick right (✓) or wrong (×) with correct

Total score (10)

- 1-The antisense strand is the strand from which the RNA is actually transcribed.
- 2-The direction of ribosome movement on the mRNA is 3'--> 5'direction.
- 3-The Leading strand is synthesized against overall direction of replication.
- 4-A correct match between a tRNA and an amino acid, done by aminoacyl-tRNA synthetase .
- 5-peripheral proteins penetrate lipid bilayer, usually across whole membrane.
- 6-The potassium-proton exchanger transports potassium ions and protons in the same directions across a membrane.
- 7-Pinocytosis is a nonspecific uptake of extracellular -molecules in an endocytic vesicle.
- 8-The plasma membrane of each cell type contains a specific set of premeases that allow any types of molecules to cross
- 9-The kinetics of facilitated diffusion can be described by the same type of equation used to describe a simple enzymatically catalyzed chemical reaction
- 10-Sodium- Potassium ATPase enzyme is a tetramer containing two nonglycosylated β polypeptide chains and two α polypeptide chains.

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Third question

Compare between Mitosis and Meiosis divisions (in table)? Total score (10)

- a- Mitosis and Meiosis divisions.
- b- Passive and active transport across the cell membrane.



Fourth question Total score (15)

Gene expression contains so many critical processes such as transcription, translation and splicing process, Explain with drawing these vital processes?

Fifth question Total score (15)

On the basis of different kinds of transport across cell membranes the drugs such as Valinomycin antibiotic and Digoxin were designed. Explain the mode of their actions on that basis.

Good Luck & Best wishes.....

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