University of Sadat City	Academic Year:	2017-2018	Course Code:	A - 14	Percentage	60%	GEBRI
			Academic Program:	Master	N. of Exam Papers	2	
	Level:	1st term	Department:	Molecular biology	Date:	Wednesday 3/ 1/ 2017	
	Course Name:	Biochemical genetics	Total score:	60 degrees	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

The questions are in Two pages

Directions: All Questions are to be answered

I. For each question, choose the ONE BEST answer — Total score (20 Marks; 2 Mark for each)

1. It is now believed that a substantial proportion of the single nucleotide substitutions causing human genetic disease are due to misincorporation of bases during DNA replication. Which proofreading activity is critical in determining the accuracy of nuclear DNA replication and thus the base substitution mutation rate in human chromosomes?

A. 3' to 5' polymerase activity of DNA polymerase δ.
B. 3' to 5' exonuclease activity of DNA polymerase γ.
C. Primase activity of DNA polymerase α.
D. 5' to 3' polymerase activity of DNA polymerase III.
E. 3' to 5' exonuclease activity of DNA polymerase δ.

2. The proliferation of cytotoxic T-cells is markedly impaired upon infection with a newly discovered human immunodeficiency virus, designated HIV- V. The defect has been traced to the expression of a viral-encoded enzyme that inactivates a host-cell nuclear protein required for DNA replication. Which protein is a potential substrate for the viral enzyme?

A. TATA-box binding protein (TBP)
B. Cap binding protein (CBP)
C. Catabolite activator protein (CAP)
D. Acyl-carrier protein (ACP)
E. Single-strand binding protein (SBP)

3. The deficiency of an excision endonuclease may produce an exquisite sensitivity to ultraviolet radiation in Xeroderma pigmentosum. Which of the following functions would be absent in a patient deficient in this endonuclease?

A. Removal of introns
B. Removal of pyrimidine dimers
C. Protection against DNA viruses
D. Repair of mismatched bases during DNA replication
E. Repair of mismatched bases during transcription

4. The *anti-Pseudomonas* action of norfloxacin is related to its ability to inhibit chromosome duplication in rapidly-dividing cells. Which of the following enzymes participates in bacterial DNA replication and is directly inhibited by this antibiotic?

A. DNA polymerase I
B. DNA polymerase II
C. Topoisomerase I
D. Topoisomerase II
E. DNA ligase

5. Parahemophilia is an autosomal recessive bleeding disorder characterized by a reduced plasma concentration of the Factor V blood coagulation protein. Deficiency arises from a 12 base-pair deletion in the Factor V gene that impairs the secretion of Factor V by hepatocytes and results in an abnormal accumulation of immunoreactive Factor V antigen in the cytoplasm. In which region of the Factor V gene would this mutation most likely be located?

A. 5' untranslated region
B. First exon
C. Middle intron
D. Last exon
E. 3' untranslated region

Professor of Course	*Pro. Dr./ Ibrahim Helmy*	Course coordinator	*Pro. Dr./ Ibrahim Helmy*
Staff Course	*Pro. Dr./ Ibrahim Helmy* *Dr./ Mohamed Younis*	Department Head	*Pro. Dr./ Ibrahim Helmy*

6. Collagen, the most abundant protein in the human body, is present in varying amounts in many tissues. If one wished to compare the collagen content of several tissues, one could measure their content of

A. glycine
B. proline
C. hydroxyproline
D. cysteine
E. lysine

7. Accumulation of heme in reticulocytes can regulate globin synthesis by indirectly inactivating eIF-2. Which of the following steps is most directly affected by this mechanism?

A. Attachment of spliceosomes to pre-mRNA
B. Attachment of the ribosome to the endoplasmic reticulum
C. Met-tRNAmet binding to the P-site
D. Translocation of mRNA on the ribosome
E. Attachment of RNA polymerase II to the promoter

8. The base sequence of codons 57-58 in the cytochrome β5 reductase gene is CAGCGC. The mRNA produced upon transcription of this gene will contain the sequence

A. GCGCTG
B. CUGCGC
C. GCGCUG
D. *CAGCGC*
E. GUCGCG

9. A gene encodes a protein with 150 amino acids. There is one intron of 1000 bps, a 5'- untranslated region of 100 bp and a 3'-untranslated region of 200 bp. In the final processed mRNA, how many bases lie between the start AUG codon and the final termination codon?

A. 1750 bps.
B. 750 bp.
C. 650 bp.
D. 450 bp.
E. 150 bp.

10. Endonuclease activation and chromatin fragmentation are characteristic features of eukaryotic cell death by apoptosis. Which of the following chromosome structures would most likely be degraded first in an apoptotic cell?

A. Barr body
B. 10nm fiber
C. 30 nm fiber
D. Centromere
E. Heterochromatin

II. Answer the following questions — Total score (15 Marks; 5 Mark for each)

1. Glycogen storage diseases that primarily affect muscle.
2. Types of lysosomal storage disorders.
3. Homocystinuria.

III. Write on details the following questions — Total score (15 Marks; 5 Mark for each)

1. Metabolic disorders - testing.
2. Mitochondrial disorders.
3. Galactosemia.

IV. Write on the following questions — Total score (10 Marks; 5 Mark for each)

1. Numerate metabolic genetics pathophysiology groups.
2. Organic-acid disorders.

Good Luck & Best wishes.....

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