
 University of Sadat City	Final Exam:	First Term	Course Code:	B1-9	Percentage		 GEBRI
	Academic Year:	2018-2019	Academic Program:	Master	N. of Exam Paper	3	
	Level:	Master	Department:	Molecular Biology	Date:		
	Course Name:	Chromosomes	Total score:	60	Time allowed:	3hr	

Name: \_\_\_\_\_

### Instructions of Exam:

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

### Answer the following questions:

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#### 1<sup>st</sup> question: (20 Marks)

- A. Compare between (Prokaryotic & Eukaryotic) Chromosomes. [5 Marks]
- B. List the main differences between Mitosis & Meiosis. [5 Marks]
- C. Mention the function of chromosome. [5 Marks]
- D. The cell cycle is controlled at three checkpoints (explain them). [5 Marks]

#### 2<sup>nd</sup> question: (20 Marks)

#### A. Answer by (TRUE) or (FALSE) and correct the mistakes if there are: [4 Marks]

- 1- In Q-banding Technique patterns; the rich region in AT bases is the Euchromatin region.
- 2- R-banding technique used to identify X chromosome, while C-banding technique used to identify Y chromosome.
- 3- The most common cause of triploid is dispermy.
- 4- Crossover is less likely between loci that are far apart on chromosomes than when they are close together.
- 5- The distance between loci can be expressed in centiMorgans, since 1 cM represents a recombination frequency of approximately 1%.

نموذج رقم: SQ0000000F101002

الإصدار (٠/٢) ٢٠١٨/٠١/١٤

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**B. Write the Scientific Terms: [4 Marks]**

- 1- The branch of genetics that correlates the structure, number, and behavior of chromosomes with heredity and diseases. (.....)
- 2- A photomicrograph of chromosomes during metaphase and arranged in a standard sequence. (.....)
- 3- Multiple of haploid number of chromosome set (.....)
- 4- A chromosome that has two copies of one arm and the no copies of the other. (.....)

**C. Choose the correct answer: [7 Marks]**

- 1- Which of the following is **NOT** a usage for chromosome banding and karyotyping?
  - a- Using banding and karyotyping to tell whether someone has blue or brown eyes.
  - b- Using banding and karyotyping to tell whether someone has an extra chromosome 21
  - c- Using banding and karyotyping to see an abnormailly shaped chromosome.
  - d- Using banding and karyotyping to see the similarities between your genes and a chimpanzee's.
- 2- Depending upon size and centromere position, the 46 chromosomes have been divided into a number of groups,
  - a- 6
  - b- 5
  - c- 7
  - d- 10
- 3- The following information is seen in a karyotype: (47, XX, +13). Describe the patient
  - a- Female with Down's syndrome.
  - b- Male with Down's syndrome.
  - c- Male with Patau's syndrome
  - d- Female with Patau's syndrome
- 4- Which of the following is **not true** about inversion?
  - a- Inverted chromosomes are generally viable.
  - b- Inversion can cause chromosome breakage.
  - c- Two DNA strands with an inverted segment will not pair.
  - d- Inversion including centromere is known as paracentric.
- 5- The polytene chromosomes were discovered for the first time in
  - a- Chironomus
  - b- Drosophila
  - c- Fruit fly
  - d- House fly

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6- The best stage to count the number of chromosomes during mitosis is, or structure of chromosomes can be best seen at

- a- Prophase      b- Metaphase      c- Anaphase      d- Telophase

7- Lampbrush chromosomes are found inside

- a- Salivary glands of *Drosophila*      c- Salamander oocyte  
b- Salivary glands of silk moth      d- Nucleus of man

D. Match the answers for disorders due to abnormal chromosome number. [2 Marks]

( 1 )	Turner syndrome		Trisomy of 21
( 2 )	Klinefelter syndrome		Trisomy of 13
( 3 )	Normal Karyotype		46, XX or 46, XY
( 4 )	Down syndrome		45, XO
			46, XXY

E. The somatic cell hybridization panel below indicates the clones that yielded a positive hybridization signal for a cDNA segment. Based on this information, on which chromosome is the cDNA segment likely to reside? [3 Marks]

Clone	DNA segment	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	X	Y
1	-	-	-	+	-	-	-	+	-	+	-	+	+	-	+	+	+	-	-	+	-	-	-	+	-
2	-	-	+	+	-	-	-	+	-	-	+	-	-	-	+	-	+	-	-	+	-	+	-	+	-
3	+	-	+	+	-	+	-	+	-	+	-	+	+	+	-	+	-	+	-	+	-	-	+	-	-
4	-	+	-	+	-	-	-	+	-	-	-	+	+	-	+	-	+	-	+	+	+	+	-	-	-
5	-	-	+	+	+	-	+	-	-	-	+	-	-	+	-	-	+	-	+	+	+	-	+	+	-
6	+	-	+	+	-	+	-	+	+	+	+	+	+	-	-	-	+	-	+	+	-	-	+	+	-

3<sup>rd</sup> question: (20 Marks)

Give a short note on artificial chromosome; functions and uses.

*With best wishes*

Professor of Course	Prof. Khalil El Halfawy		Course coordinator	
Staff Course	Prof. Khalil El Halafawy Prof. Hadia Heikal Dr. Gehan Ibrahim		Department Head	Prof. Samir El Masry
Exam group	Prof. Khalil El Halafawy, Prof. Hadia Heikal, and Dr. Gehan Ibrahim			
	