University of Sadat City	Final Exam:	May Season	Course Code:	B4-26	Percentage:	60%	GEBRI
	Academic Year:	2018-2019 2nd term	Academic Program:	Animal Biotechnology (Ph. D.)	N. of Exam Paper:	3	
	Level:	Ph. D.	Department:	Animal Biotechnology	Date of Exam:	11-6-2019	
	Course Name:	Transgenic Animals	Total score:	60	Time allowed:	3 hrs.	

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

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Answer the following questions:

1st question: **30 M**

A- Choose the correct answer: **10 marks**

1- ..... is an application of nuclear microinjection?

1. Somatic cell nuclear transfer
2. Embryonic stem cell transfer into blastocyst.
3. Zygote pronuclear DNA microinjection.
4. Intracytoplasmic Sperm Injection.

2- ..... is used for producing transgenic animals.

1. Intracytoplasmic Sperm Injection.
2. Zygote pronuclear DNA microinjection.
3. Embryonic stem cell transfer into blastocyst.
4. All of the above.

3-In intracytoplasmic sperm injection (ICSI) sperm is injected in .....

1. Chemically activated metaphase-II oocytes.
2. 2-cell stage embryo.
3. Enucleated oocytes.
4. Pronuclear zygote stage.

4- Somatic cell nuclear transfer is used for:

1. Producing heterozygous livestock.
2. Producing hemizygous transgenic animals.
3. Producing genetically identical clones and transgenic clones.
4. All of the above

Professor of Course	Ass. Prof. Dr. Osama Badr	Course coordinator	Ass. Prof. Dr. Osama Badr
Staff Course	Ass. Prof. Dr. Osama Badr Dr. Ebrahim Sabra	Department Head	Prof. Dr. Bahgat Elfiky
Exam group	Prof. Dr. Bahgat Elfiky, Ass. Prof. Dr. Osama Badr and Dr. Ebrahim Sabra		

5- In pronuclear microinjection the genetic material is injected in:

1. Polar body of metaphase II oocyte.
2. Male pronucleus of one cell zygote.
3. Chemically activated metaphase-II oocytes.
4. Enucleated oocytes.

6. Any microinjection system is typically comprised of:

1. Microinjector and its micromanipulator, micropipette and its micromanipulator and an inverted microscope.
2. Micromanipulators, Microinjectors and conventional microscope.
3. Microinjector and its micromanipulator, micropipette and its micromanipulator and an electronic microscope.
4. Fluorescent microscope, camera, microinjector.

7. Further interbreeding is done to obtain.....

1. Heterozygous transgenic offspring.
2. Homozygous transgenic offspring.
3. Hemizygous transgenic offspring.
4. None of the above.

8. In pronuclear microinjection embryos are collected from a .....

1. Pseudopregnant female.
2. Superovulated female.
3. Chemically stimulated female.
4. Enucleated female.

9. ..... is the best way for producing gene knockout mice.

1. Somatic cell nuclear transfer.
2. Intracytoplasmic Sperm Injection.
3. Zygote pronuclear DNA microinjection.
4. Transfer of genetically altered embryonic stem cells into blastocyst.

10. DNA binds to sperm cell's plasma membrane by.....

1. Specific DNA- binding protein.
2. Special cell anchoring mechanisms.
3. Cell membrane pores.
4. gonadotrophins.

B- Write the scientific term of each item: **10 marks**

1. Direct microinjection of DNA into a nucleus of one cell zygote.
2. Injecting a substance in the cytoplasm of the cell.

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3. The use of a glass micropipette to inject a liquid substance into a cell under the microscope.
4. An oocyte with its nucleus removed.
5. Individuals produced by somatic cell nuclear transfer.
6. Injecting the head of the sperm inside the cytoplasm of the oocyte.
7. Hormones used for super ovulating females before collection of oocytes.
8. The female animal to its uterus the embryo is transferred for production of transgenic animals.
9. An animal that has the new DNA in all of its cells.
10. Cells that have the potential to develop into any type of cells found in the body.

C- Vectors play an important role in transgenic of animal cells. Explain in detail. **10 M**

2nd question: **15 M**

Write briefly about the Followings:

a- The basic methods of producing transgenic animals. **5 M**

b- The transgenic fishes, mice and livestock. **5 M**

c- Properties of viral vectors. **5 M**

3rd question: **15 M**

Discuss in detail with drawing the Followings:

a- Transgenesis creation and detection. **9 M**

b- The role of Adenoviruses and Adeno-associated viruses in transgenesis. **6 M**

With best wishes