Mansoura University
Faculty of Science
Botany Department
El-Mansoura, Egypt

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

First-Term Examination in Biotech
January 2015

Educational Level: Second level **Program: Biotechnology and Applications (New and Specific)**

Subject: B (204) **Course(s): Basics and Principles of Biotechnology**

Time: 2 hrs **Date: 18/1/2015** **Full mark:** 60

Answer the following questions:

Q1: A- Explain the following terms (8 Marks):

a- Plant Hybridization

b- Totipotent cell

c- Restriction endonuclease

d- α-amylase inhibitors

e- Ti Plasmid

f- osmoprotectants

g- Metabolic engineering

h- Embryonic stem cell

B- Write on the following points :

1- Applications of transgenic mice (3 Marks)

2- The production of antibiotics (4 Marks)

Q2 A- How did the scientist overcome the following problems? (8 Marks):

1- Ti plasmid was not able to replicate

2- Herbicides negative effect on economic plants

3- The increasing needs to lipase enzyme

4- The problems of plant breeding

B- Answer the following questions based on the represented figure:

a- This figure represents ..... and it might be benefit in ..... **(One Mark)**

b- The organism used in this experiment should be ..... because it has the following merits i-..... and ii- ..... and the circular molecule inserted in it is called ..... **(2 Marks)**

P.T.O من فضلك اقلب الصفحة

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c- The resulted cell is called ..... **(half Mark)**

d- Indicate at least two applications for the experiment indicated in the figure **(3.5 Marks)**

Q3: Write a concise report on:

a- Biomolecules **(7 marks)**

b- Chemical forces important to biomolecules **(8 Marks)**

Q4: Give your knowledge and understanding about:

a- Biotechnology **(7 Marks)**

b- The key to life. **(8 Marks)**

Best Luck
Prof. Mohammed Nagib Hasaneen
Dr. Amr Mowafy

مستوى ثانى التكنولوجيا الحيوية وطبيرى

Mansoura University
Faculty of Science
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جامعة المنصورة
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Final Examination in Botany
First Term: Jan. 2015

Educational Year: Second Level **Program : Biotechnology**
Courses: Plant biochemistry
Code: (B 203) **Time :2 hrs** **Date: 28/12/2014** **Full mark: 60**

Answer the following questions:

Q1: Write short notes on: (15 marks)
a- Sucrose synthesis in plants. (8 marks)
b- Classification of monosaccharides. (7 marks)

Q2: What do you know about each of the following? (15 marks)
a- Fermentation reactions. (7 marks)
b- The light reactions in photosynthesis. (8 marks)

Q3: Discuss each of the following: (15 marks)
a- The reactions of glyoxylate cycle. (4 marks)
b- The β-oxidation pathway of fatty acids. (4 marks)
c- The conversion of acetyl-CoA to malonyl ACP. (2 marks)
d- Synthesis of an amino acid aspartate by reductive amination method, referring to the structural formula. (2.5 marks)
e- Elongation step of translation of protein synthesis (Draw only). (2.5 marks)

Q4: (15 marks)
A- Complete the following: (5 marks)
1- ……..and ……..are the majors types of lipids.
2- The functions of lipids are …… , ……. and ……..
3- The structural formula of alanine-glutamate-glycine tripeptide is …….
4- The general formula of amides is ……
5- The structural formula of the general equation of transamination reaction is ……

B- Compare between the following in a table: (7 marks)
1- Saturated fatty acids and unsaturated fatty acids. (2 marks)
2- tRNA, mRNA and rRNA, referring to the description and the function. (5 marks)

C- Define each of the following. (3 marks)
1- Transcription. 2- Promotes.
3- Anticodon. 4-Termination signals.

Examiners:
Prof. Samia Ali Haroun
Dr. Rasha M. Eid Gamel

Mansoura University
Faculty of Science
Physics Department

First term Exam, 21/1/2015
2nd level Biotechnology
Time allowed : 2 hours

Full mark : 80 marks

Subject : physics **Course : 201ف** **مبادىء الكهربية في الأنظمة الحيوية**

Answer the following questions:

1) a) Give an explanation of the action potential and resting potential in a cell. What do you mean the propagation of an action potential in a body and what is the factors affecting the speed of propagation? (14 marks)

b) Compare between the afferent nerves and efferent nerves. (6 marks)

2) a) Write the scientific terminology for each of the following:

1) Electrical signals from the retina.
2) Electrical signals from the muscles.
3) Electrical signals from the eye.
4) Electrical signals from the heart.
5) Electrical signals from the brain. (15 marks)

b) The electrical potential inside a typical living cell is 0.07 V lowers than that outside of the cell. The thickness of the cell is 0.10 micrometers. What is the magnitude of the electric field within the cell membrane? (5 marks)

3) Deduce a formula for calculation the electrical potential across the membrane of an animal cell for Na^+, K^+,,Ca^{+2} or Cl^- ions by knowing the concentrations ratio at a normal temperature (310K) of a cell. If you give the concentration of Cl^- ions are C_e = 125 mmol/liter and C_i=9 mmol/liter, calculate the potential difference V(Cl) across the membrane. (20 marks)

4) Write the mathematical formulae for calculating each of the following:

1) Electric field for ion charge inside a living cell.
2) The electric potential difference between the cell membrane.
3) The work done to the charged ions transfer.
4) The total capacitance of three capacitors connected in series. (20 marks)

With my best wishes

Prof. Dr. Mohammed A. El-Bakary

Mansoura University
Faculty of Science
Botany Department

جامعة المنصورة
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Final Examination in Botany
First Term: Jan. 2015

Educational Level: Second Level **Program : Biotechnology**
Course: Nuclear and Cytoplasmic Genetics (205ن)
Time: 2 hrs **Date: 21 /1/ 2015** **Full mark: 80** **Question mark: 20**

Answer the following questions:

Q.1: Complete the following sentences using suitable words: **(20 marks)**

1- There are two main kinds of polyploids……..and……
2- There are four stages of mitosis……..,……..,……..and……..
3- Two major types of chromosomal abnormalities that result in change in chromosome number are……..and…….
4- Thymine is always paired with……and Cytosine is always paired with…….
5- The diploid organisms have one extra chromosome are known as……..
6- There are four types of chromosomes according to the position of centromere……..,……..,…….and……
7- The division of cytoplasm is known as……..
8- In cell cycle, the interphase stage divided into three parts…..,…….and…….
9- Polytene chromosomes are special types of ……

Q.2: A-Write a brief notes on the four different kinds of structural changes in the chromosome. **(12 marks)**

B- Compare between the following:

1- Metaphase I and Metaphase II in Meiosis. **(4 marks)**

2- Prophase and Telophase in Mitosis. **(4 marks)**

Q.3: What is the meaning of each of the following? **(20 marks)**

1- Triticum type of plastid inheritance
2- Petite mutants
3- Molecular farming
4- Genetic markers in plastid inheritance

Q.4: A- Draw the scheme illustrating the changes in the organeller DNA in the four types of generative cell. **(7 marks)**

Q.4: B-"Maternal inheritance is a transgene confinement tool" Discuss this statement.

Q.4: C- How protoplast fusion is fruitful in biotechnology? **(7 marks)**

Best Wishes: Dr. Rehab Mahmoud Dr. Ashraf Elsayed

Mansoura University Faculty of Science Chemistry Department Subject: Analytical chemistry Course(s): Chem. 201	كلية العلوم جامعة المنصورة	First Term, final exam 2nd level Biotech. Program . Time Allowed: 2 hours Full Mark: 60 Marks Date :4 /1/2015

Answer The Following Questions

First question: (15marks)

1.a) **Define the following terms:**

i)Equivalent weight, ii) Transmittance and absorbance iii) Buffer solution,
iv) Titration error, v) Molar absorptivity, vi) Gravimetric factor
vii) Solubility product viii) Hydrolysis ix) Reduction potential x) Standard deviation

1b) Calculate the pH of 50ml of 0.1M CH_3COOH on addition of the following volumes of 0.1M NaOH:

a) 0. 0ml b) 25ml c) 50ml d) 60ml

Knowing that ($Ka_{CH3COOH} = 1.8x10^{-5}$, pKa= 4.76)

Second question: (15marks)

2.a) Give an account on the different types of indicators used in acid –base titrations

2.b) –How does the relative super-saturation affect the particle size of a precipitate? Indicate the optimum conditions for getting a crystalline precipitate.

2c) Calculate the solubility of $MgCO_3$ in g/l if $Ksp_{MgCO3} = 4x10^{-5}$ (Mg =24, C=12, O =16)

Third question: (15marks)

3.a) Calculate the number of m. equivalents of H_2SO_4 in the following :

a) 0.49g of H_2SO_4 b)20ml of .05 M H_2SO_4

c) 50ml of 0.1 N H_2SO_4 + 30ml of 0.1 N NaOH +20ml H_2O [H=1.0, S=32, O=16)

3b) Draw a schematic diagram of a flame atomic absorption spectrophotometer explaining in detail the radiation source and the mode of atomization.

3c) Calculate the pH at which Fe(III) is completely precipitated as $Fe(OH)_3$ if $K_{SP\ Fe(OH)3} = 3.8 \times 10^{-38}$

Fourth question: (15marks)

4a) Compare between permanganate and dichromate as oxidizing agents, also write the equations for oxidation of Fe^{2+} with both reagents in acid medium.

4b) Discuss different types of contamination of precipitate showing how you can avoid co-precipitation

4c) Discuss different indicators used for Visual detection of end point in red-ox titrations

With my best wishes

Prof. Dr. Magdi E. Khalifa

عتكنولوجيا حيوي - (ب٢٠٢) فطريات وامراض نبات

Mansoura University | جامعة المنصورة
Faculty of Science | كلية العلوم
Botany Department | قسم النبات
El- Mansoura, Egypt | المنصورة- مصر

2[St] level Biotechnology (Credit hrs) **Course: Fungi and plant pathology (B 202)**

Time: 2 hrs **Date: 11 / 1 / 2015** **Full mark: 60** **Question mark: 15**

1- (A) Complete the following sentences:-

1- Types of Sexual reproduction in Mycophyta is .... , ...,.......,....,.......
2- Asexual reproduction in yeast is ...., ...
3- Classification of Mucorales into families as ...., ...,..............
4- Spores produced in the hosts of *Puccinia graminis* are .....,........,....,......
5- Nutrition in mycophta is ....,................,..........................
6- Haplobiontic life cycle is .... and Diplobiontic life cycle is ....
7- Ascocarps in Ascomycetes are ...., ..., ...
8- Kingdom of mycota are classified into 3 Divisions are ...., ..., ...
9- Beneficial Fungi could be used in ...., ...,............, ...
10- *Rhizopus* reproduce asexual by .... and sexual by formation of ....

2- (A) Write short notes with labeled diagrams on the following:-

a- Classification of Erysiphales into genera.
b- Formation of Basidium and asidiospores.

(B) Choose the correct answer:-

1- Dikaryotic mycelium is (**a-** haploid **b-** Uninucleated **c-** Binucluated).
2- Vegetative reproduction in fungi (**a-** oogamous **b-** oidia **c-** exogenous spores).
3- Ascospores contains (**a-** 4 spores **b-** 6 spores **c-** 8 spores).
4- pathogenic fungi used (**a-** human **b-** bacteria **c-** virus) as a host.
5- Collumalated sporangium in (**a-** *Rhizopus* **b-** *Aspergillus* **c-** *Fusarium*).

3- Write an account of:-

a- Kock's postulates. **b-** Classification of plant diseases.
c- Enzymatic degradation of host pectic substances by pathogens.

4- **a- Define** ' plant pathology' and what are its objectives.
b- Describe histological defense mechanisms.
c- Differentiate between symptoms, sign and syndrome.

"Best of Luck"

Examiners: Prof. Dr Gamal M. Abdel-Fattah **Dr. Huda M. Soliman**