المستوى الرابع- ميكروبيولوجي- علم زراعة الأنسجة النباتية (م ٤١٤)

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

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Theoretical Examination in Botany
First Term: December 2014

Educational Year: Forth Level | **Program (Branch):** Microbiology
Subject: M 414 | **Course(s):** Plant Tissue Culture
Time: 2 hours | **Full Mark:** 60 | **Date:** 27 / 12 / 2014

Answer all of the following questions

(Q_1) A- Mention the reason(s) for the following: (9 marks)

1. Neither sugar alcohols nor starch are preferred as carbon source in tissue culture media.
2. The culture vessel should be opened and put in greenhouse for several days before the transfer of plantlets to soil.
3. Subculturing often becomes imperative after a period from culture initiation.

B- Complete the following sentences as suitable: (6 marks)

1. The term plant growth regulators describes ..... while phytohormones are .....
2. Differentiation is a process during which cells undergo ..... in their cell wall and protoplasm to possess distinct ..... with unique .....
3. Organ differentiation can be regulated by interplay of .....and ....., where equal ratio of them causes .....
4. In 1941, J. Van Overbeek discovered the nutritional value of ..... for the culture of isolated carrot embryo.
5. The choice of explant determines ....., ... and .....

(Q_2) A- Mark as true or false with correcting the underlined parts when wrong: (6 marks)

1. Incubation conditions of a plant tissue culture may lead to callus formation in an organized growth pattern.
2. Plastic wares made of polypropylene and polycarbonate can be autoclaved.
3. The period from the initiation of a culture to the time of its transfer to a fresh medium is called a passage.
4. Latent contamination may be caused by contaminants present endogenously in the initial plant material and are not obviously pathogenic *in situ*.
5. As a rule of thumb, the initial pH of plant culture media is set at 5.5 – 7.0.
6. Under *in vitro* conditions, the plantlets have very strong roots.

B- Write briefly on: (9 marks)

1. Laminar airflow hoods
2. Disadvantages of plant tissue culturing
3. Incubation of plant tissue cultures

(Q_3) Complete the following: (15 marks)

1. Suspension culture is produced from ..... in ..... ; they need continuous ..... to facilitate ..... and ..... . They are divided into ..... , ... and .....
2. The significance of cell suspension cultures can be summarized as ..... , ... and .....
3. Measurements of growth and metabolism in cell suspension cultures can be achieved by ....., ... , ... , ... , ... , ... and .....

(Q_4) Give short note on: (15 marks)

1. Pollen and anther culture
2. Isolation and fusion of protoplasts and its advantages
3. Piant tissue culture in production of secondary products

Best Wishes;

Prof. Samy A. Abo-Hamed & D. Bardees M. Mickky

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٤ ميكروبيولوجي - سيلوجيا جزيئية م ٤٠٤

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جامعة المنصورة
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المنصورة - مصر

Final Examination in Botany — First Term: Jan., 2015

Educational Year: Fourth Level — **Program (Branch): Microbiology**

Course : Molecular Biology (M402) — **Time: 2 hrs** **Date: 30 / 12/2014** **Full mark:** 60

Q-1- A - Choose the correct answer(s) (one mark/each):

1. **Cloning is an example of which type of reproduction?**
   a. Binary fission b. Sexual c. Asexual d. Conjugation
2. **The animal that gives birth to the cloned animal is known as a...**
   a. Carrier b. Surrogate c. suffragette d. syndicated
3. **The best vector in which to clone a 1.2 kb fragment of DNA is a**
   a. cosmid. B. bacteriophage c. plasmid d. YAC e. BAC
4. **Plasmid DNA is treated with restriction enzyme A, and three bands are seen on an agarose gel following electrophoresis. This plasmid therefore has---------- -------- restriction sites for enzyme A.**
   a. One b. Two c. Three d. Four
5. **Of the sequences shown below, which would be the most likely target sequence for a restriction endonuclease?**
   a. TATAAT b. CATTAC c. GCCTGC d. GAUUAC
6. **The probability of finding a restriction site for enzyme A, which has a 6 nucleotide recognition sequence, on a molecule of DNA is**
   a. 1/256. B. 1/1,024. C. 1/4,096. D. 1/16,384.
7. **A cDNA library represents all of the ___ in a cell.**
   a. Genes b. DNA c. snRNA d. mature mRNA
8. **Scientists wished to create an organism capable of breaking down** several kinds of toxic wastes, so they combined genes from several species of bacteria to create a single superbacterium. They probably did NOT need to use which of the following?
   a. nucleic acid probes b. reverse transcriptase
   c. plasmids d. T4 DNA ligase e. restriction enzymes
9. **Which statement is NOT true about gene cloning?**
   a. Scientists can locate a gene by visibly looking for it in a genome
   b. Gene libraries are important part of the gene cloning process.
   c. Genetic engineers use markers to identify colonies of cells that contain specific DNA sequence.
   d. all of the above are not true about gene cloning.
10. **Transposons are genetic elements that**
    a. have the ability to generate copies of themselves
    b. can reinsert at another location, apparently randomly into chromosomes.
    c. are clones of a particular gene in a genomic library
    d. used to probe a Southern transfer of a digest of genomic DNA made with the specific restriction enzymes

Q-1- B – Write T for true and F for false statement and then correct the false one. (One mark/each)

1. The first class II RE isolated from *Bacillus amyloliqufaciens*H and *Bacillus globigii* are named BamH and Bgl, respectively.

P.T.O

2. A transcriptase is the enzyme used to make cDNA copies from mRNA template and works in reverse direction.
3. A eukaryotic gene cloned from genomic DNA library can be expressed directly in the host bacterium.
4. Splicing is the process that does remove exons and conserve introns.
5. PCR is a technique that uses primer sequences corresponding to either end of the selected DNA fragment to effectively replicate the fragment.
6. Chromosome walking is a technique which allows you to "walk" from closely linked genetic markers to your gene of interest using clones from a genomic library.
7. RNA polymerase needs a primer to initiate transcription.
8. Direct physical contact is required for the horizontal transfer of genetic material and/ or naked molecule of DNA between bacteria.
9. Gene therapy involves replacing organs affected with genetic disorders by correct version of the faulty gene.
10. Sequencing the DNA of organisms like biotechnology of fruit flies and yeast is useful because it determines the exact order of nucleotides in DNA.

Q.2. A. A circular plasmid vector contains two EcoRI restriction sites is cleaved with EcoRI and annealed with purified EcoRI fragment from different source. **Diagram** all possible annealing products that contain two fragments or less and can replicate if introduced into a bacterium. **Assume** that the plasmid fragments produced by EcoRI cleavage are **unequal** in size and that the genes required for plasmid replication are on the larger of these fragments. **(10 marks).**

Q.2. B. Compare between each pair of the following (10 Marks):

1- Nuclear and Plastid transformations.

2- Particle acceleration gene transfer and *Agrobacterium* transfer.

Q3: Answer the following using the instructions between brackets: (20 Marks)

1- Stability of transgene expression. (Discuss)

2- Levels of organization of chromatin (Draw)

3- Promoter classes in transgenic plants. (Write short notes)

4-. Hisotons (Discuss)

Best of luck: Professor Yehia Ellazeik Dr. Ashraf A. Elsayed

٤ ميكروبيولوجي - فطريات ومقاومة الأمراض وعلاقة العائل بالطفيل (م ٤٠٥)

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

جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
Frist Term: Jan. 2015

Educational Year: 2014-2015 **Program (Branch):Microbiology**
Level4
Subject:Botany **Course(s):Mycology and phytopathology**
Time: 2 hrs **Date: 17 /1 /2015** **Full mark: 60** **Question mark: 20**

Answer the following questions:

Q1: <u>I- fill in the spaces using the correct words (10 marks):</u>

a-...(1)...are The appearance or manifestation of changes in the normal form and/or function of the plant while ...(2)...are the appearance and/or physical evidence of the causal factor of the plant abnormality.
b-...(3)...is the transformation of floral organs into leaf like structurs while...(4)...is the organized loss of a part of a plant and ...(5)...is the the rigid downward bending of the upper surface of a leaf.
c-...(6)...is a pathogen of biotic origin which is called ...(7)...when it can cause disease and if it is...(8)...it does not cause severe disease.
d-......(9)...is an organism (plant) that is harboring a parasite or pathogen from which it obtains its nutrients while ...(10)...refers to the varios kinds of host plants that a givin pathogen may parasitize.

II-Give an account on each of the following:

a- Classification of plant diseases (5 marks)
b- General principles of plant disease management (5 marks)

Q2 : Using illustrative diagrams describe each of the following:

a- The role of pectic enzymes in pathogenesis (5 marks)
b- Direct penetration through intact plant surfaces (5 marks)
c- Histological defense structures (5 marks)
d- Hypersensitive response (5 marks)

Q3 : Write an account on each of the following:

1- Mechanisms of biological control (5 marks)
2- Essential conditions for an epiphytotic (5 marks)
3- Koch's postulates (5)
4- Host specific and non host specific toxins (5)

Examiners :

Prof. Gamal Abdel-Fatah Dr. Hoda Soliman

Mansoura University
Faculty of Science
Botany Department

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

Educational Year: Fourth Level **Program (Branch): Microbiology**
Subject: (M 406) **Course(s): Genetics**
Time: 2 hrs **Date: 17/1/ 2015** **Full mark: 60** **Question mark: 20**

Answer the following questions:

Q.1: A- "Color blindness is much more frequent among men than among women" Explain in details this statement with examples. **(10 marks)**

B- Give an account on the following: **(10 marks)**

1- Dominant lethal genes.

2- Multiple alleles and give an example.

Q.2: Complete the following sentences using suitable words: **(20 marks)**

1- Interaction of genes controlling the same character is called…..
2- Inheritance of comb shape in Poultry there are four types in F2 progeny produced ……..,……..,……..,……..and F2 ratio is…….
3- The external feature of character is termed….
4- Based on Mendel experiments , he put two important principles or laws, these are….. and…..
5- Variants or different forms of gene are called…….
6- In quantitative inheritance the F2 phenotypic ratio is……
7- Hemophilia is…..trait.
8- Genes located on Y- chromosomes called.....but the genes located on x and y chromosomes called……..
9- F2 phenotypic ratio in agouti colour of mice is…..
10- Incomplete Epistasis modifies the Mendelian F2 ratio into……
11- Crossing of F1 individuals with one of the two parents……..
12-…….. individuals have different alleles whereas…....individuals have similar alleles.
13- Cross of an individual of unknown genotype to completely recessive individual called ……..

Q.3: Write a brief notes on each of the following: **(20 marks)**

1- Types of dominance. **(8 marks)**
2- Complementary genes. **(6 marks)**
3- Inheritance of Fruit shape in *Capsella bursa pastures*. **(6 marks)**

Examiners: Prof. Magda I. Soliman Dr. Rehab Mahmoud

Mansoura University **Faculty of Science** **Chemistry Department** **Subject code: Chem. 415** **Course: Electro-analytical chemistry and spectroscopic methods of analysis**		**First semester examination** **4th level students** **Program: Chemistry/Zoology and Chemistry/Botany** **Date: 13/1/2015** **Time allowed: 2 hours** **Full mark: 80 marks**

Answer the following questions: (الأسئله في صفحتين)

Section A: (Spectroscopic methods of analysis) (40 marks)

Question 1: (20 marks)

a. **Define each of the following: (10 marks)**

1. Spectroscopy.
2. Frequency.
3. Atomic absorption spectrum.
4. Chromophore.
5. Turbidimetry.

b. **Compare between:** obedience and deviations of Beer's law. **(6 marks)**

c. **Calculate** the molar absorptivity coefficient of $K_2Cr_2O_7$ at 455 nm, given that: **36.5 mg** was dissolved in **500 mL** and exhibits **12%** transmittance at 455 nm in a **2-cm** cell. (K=39, Cr=52, O=16). **(4 marks)**

Question 2: (20 marks)

a. **Put true (√) or false (×) and correct the wrong one: (10 marks)**

1. Saturated hydrocarbons can be analyzed using UV radiations.
2. In phototube detector, electrons move from anode to cathode.
3. The sample holder which used in UV analysis is made of crystalline NaCl.
4. Deformation vibrations involve change in bond length.
5. The source of colour in V_2O_5 is due to charge transfer spectra.

b. **Sketch the diagram which represents:** the atomic transition. **(4 marks)**

c. **Calculate** (ν, λ and E) for (O-H) bond knowing that: ($k=7.7\times10^5$ dyne/cm, $h=6.63\times10^{-34}$ J/s, $c=3\times10^{10}$ cm/sec, O=16, H=1). **(6 marks)**

Please turn the page →

Section B: (Electro-analytical chemistry) (40 marks)

Question 3: (20 marks)

a. **Complete each of the following sentences: (5 marks)**

1. ISE's not affected by ..... or.....
2. In Gran's Plot, ... is plotted against.....
3. As^{3+} can be determined by titration with I_3^- at pH.....in presence of ..... solution.
4. In potentiostatic coulometry, ... and .....will decrease with time.
5. Ilkovic equation used for ..... analysis, while $E_{1/2}$ used for ..... analysis.

b. **Put true (√) or false (×) and correct the wrong one: (5 marks)**

1. In static methods, no current passes in the electrochemical cell as in potentiometry.
2. Electrodes of **4th** kind can follow the reaction mechanism for any redox reaction.
3. Alkaline error appears in glass electrodes when the measured pH is lower than the true pH.
4. High stirring rate in controlled-potential coulometry will help to minimize electrolysis time.
5. The current maxima may be removed by addition of surfactant like (Triton X-100).

c. **Sketch the diagram which represents**: the cell used for electro-deposition process. **(4 marks)**

d. A cyclic voltammetric peak current of (**10.5 µA**) is observed for (**0.6 mol/L**) solution of vitamin C at glassy carbon electrode of (**3.2 mm^2**) area with potential scan rate of (**0.25 v/sec**). **Calculate:**

1. i_p if potential scan rate is (**1.5 v/sec**) and concentration is (**0.9 mol/L**). **(3 marks)**
2. E^o_{mid} and **number of electrons**, if (E_{pa}= **0.5566 v** and E_{pc}= **0.5271 v**). **(3 marks)**

Question 4: (20 marks)

a. **Define each of the following: (6 marks)**

1. Potentiostat.
2. Coulometry.
3. Stoke-Einstein equation.

b. **What are the coulometric titration terms analogous to the conventional volumetric titration terms given below: (4 marks)**

1. Concentration of titrant.
2. Volume of titrant.

c. **Comment on the following: (6 marks)**

1. **Co** and **Fe** cannot be used as electrodes of **1st** kind.
2. Bubbling N_2 into the solution for several minutes before polarographic measurements.

d. A **10 mg** sample of a purified organic base is dissolved in **150 mL** of alcohol-water solvent, and H_3O^+ is generated externally at **100 mA** and delivered to the solution. If **193 sec** are required to reach the methyl orange end point, **calculate the molecular weight** of the organic base knowing that the number of electrons involved in the reaction = **3**. **(4 marks)**

Good luck: Dr. Yasmeen Gaber and Dr. Hany Moustafa

٤ ميكروبيولوجي - تخمرات وصناعات تخمرية م ٤٠٣

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Faculty of Science
Botany Department
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Final examination in Botany
First Term Jan. 2015

Educational Year: Fourth level **Program (Branch):** Microbiology
Subject: M 403 **Course:** Fermentation and fermentation industries
Time: 2hrs. **Date:** 1/1/2015 **Full mark:** 60 **Question mark:** 20

Answer the following questions as requested

Q1):-

1-What are the factors considered during medium preparation & inoculation via fermentation process?(12 marks)

2- If yeast cells are used to make a carbonated soft drink, would alcohol still be produced & explain? (8 marks)

Q2):-

1-What are the advantages of Chemo stat, Antifoaming agents, and Fermenter Jacket? (9 marks)

2-Describe briefly the downstream processing *Penicilium notatum* to produce penicillin G & for *Saccharomyces cerevisiae* to produce compressed yeast? (11 marks)

Q3):.

1- Give a short account on basic features of a stirred tank bioreactor; Oxygen delivery system, showing types of generated shear forces.(10 mark)

2- Mention the effect of the volumetric oxygen transfer coefficient (k La) During fermentation process.
(10 marks)

With my best wishes

Examiner:- *Dr. Ahmed El-Shobaky*