

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



جامعة المنصورة
كلية العلوم
قسم النبات
المنصورة - مصر

Final Examination in Botany
First Term: Jan. 2011

Educational Year: Fourth Level

Program (Branch): Microbiology

Subject: M(414)

Course(s): Plant tissue culture

Time: 2 hrs

Date: 25 / 12 / 2013

Full mark: 60

Question mark: 20

Answer the following questions:

(20 mark, 10 mark each)

Q1 **A:** Describe the term subculture and explain the factors determining its frequency, why do researchers have to do it? How would you do it for callus, shoot, and cell suspension cultures? Does subculture has any hazards?

B: Define the following terms:

Cell suspension culture, totipotency theory, explant, callus, somaclonal variation, differentiation, embryogenesis, morphogenesis, rejuvenation, Hardening off.

Q2.

(20 mark, 10 mark each)

A: Describe protoplast culture, its initiation and uses.

B: What is anther culture? How can haploid plants be produced using anther culture? Why is this useful?

Q3.

(20 mark)

Describe each of the following:

- i- Different types of calli
- ii- Significance of plant tissue culture for society.
- iii- Phytohormones and their role in plant tissue culture.
- iv- General steps of initiation and establishment of a plant tissue culture system.
- v- Growth curve of plant cell suspension culture.
- vi- Methods of initiation and establishment of a plant cell suspension culture

Best wishes

Examiners: Dr. Farag Ibraheem



Educational Year: Fourth Level

Program (Branch): Microbiology

Subject: (M402)

Course(s): Molecular Biology

Time: 2 hrs

Date: 29 / 12/2013

Full mark: 60

Q.1. A. Choose the correct answer, one mark each.

1. During recombinant DNA techniques, how are the bacterial cells that take up the plasmids isolated from those that do not?
 - a. using mRNA or information on the protein sequence
 - b. by use of the polymerase chain reaction
 - c. sequencing each of the plasmids
 - d. using antibiotic resistance plasmid genes and antibiotic-containing media
 - e. screening for restriction fragment length polymorphisms
2. How do you help ensure that each bacterium in a library contains only one gene-containing plasmid?
 - a. Genes with more than one plasmid do not survive the antibiotic.
 - b. You need to screen using a radioactive RNA probe.
 - c. It is a matter of numbers and probability-far more bacteria than plasmids are mixed together.
 - d. Only a small amount of calcium salt is used to facilitate the incorporation of the plasmid into the bacterial cell.
 - e. This is why it is so important to spread the bacteria sparsely onto the culture dish.
3. Why is *Thermus aquaticus* so useful?
 - a. It is necessary for the mass production of bacteria containing a plasmid with an inserted gene.
 - b. It is used in automated DNA sequencing
 - c. It is used in RFLP mapping.
 - d. It facilitates the polymerase chain reaction.
 - e. It is used to create recombinant plasmids.
4. How DNA fingerprinting are detected?
 - a. by looking at the chromosome in the microscope
 - b. by doing a standard Mendelian cross
 - c. by observing DNA of different lengths on a gel
 - d. by seeing with which plasmids they will combine
 - e. by amplifying the DNA using PCR
5. How would you identify the bacterium in a library if you knew the sequence of the protein it coded for?
 - a. You would put radioactive protein on the petri dish.
 - b. You would put a synthetic radioactive nucleotide probe, designed from the protein sequence and the genetic code, onto the petri dish.
 - c. Because of the antibiotic, only the one of interest would survive.
 - d. You would check to see whether a protein of the desired sequence is being synthesized by each bacterium.
 - e. You would use DNA polymerase.
6. Plasmids are defined as
 - a. non-circular DNA segments in bacteria



- b. small, self-replicating DNA molecules in bacteria
 - c. made of RNA and necessary for protein synthesis
 - d. found only in single copies within bacteria
 - e. circular DNA molecule necessary for bacteria to reproduce
7. In recombinant DNA research, the enzymes used to cut the genes are called
- a. DNA polymerases
 - b. RNA polymerases
 - c. spliceosomes
 - d. replicases
 - e. restriction enzymes
8. Which of the following describes the fragments of DNA produced by restriction enzymes?
- a. They are circular in shape.
 - b. They have fused ends.
 - c. They have single-stranded "sticky ends."
 - d. They are all the same length.
 - e. They are useful genes needed for protein synthesis.
9. The polymerase chain reaction (PCR) is useful for
- a. analyzing a person's fingerprints
 - b. cutting DNA into many small pieces
 - c. allowing restriction enzymes to cut DNA at palindromes
 - d. creating recombinant plasmids
 - e. making many copies of a small amount of DNA
10. Which of the following is *incorrect* regarding bacterial genomes?
- a. Many bacteria possess a single circular genome.
 - b. Some bacteria possess more than single genome
 - c. Some bacteria possess linear genome
 - d. Some linear bacterial genomes are protected from DNA repair process by forming covalent linkages between the 5' and 3' ends.
 - e. None of these statements is correct
 - f. All the statements are correct

B. Which of the following statements is True (T) or False (F), correct the false one. (one mark each).

- 1- The name of restriction endonuclease enzymes is often derived from the name of the bacterium producing the enzyme.
- 2- DNA molecules can be synthesized outside of cells
- 3- Vectors typically code for a phenotypic trait that can be used to detect their presence.
- 4- It is impossible to express gene products from eucaryotic genes in bacterial cells
- 5- In recombinant methods, the term "vector" refers to a plasmid or other agent used to transfer DNA into a living cell.
- 6- 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 nucleic acid probes and / or reverse transcriptase



- 7- When a typical restriction enzyme cuts a DNA molecule, the cuts are staggered so that the DNA fragments have single-stranded ends. This is important in recombinant DNA work because it allows a cell to recognize fragments produced by the enzyme.
- 8- DNA ligase enzymes could create a bond between the adjacent, unjoined nucleotides.
- 9- Gene cloning occurs when a bacterium takes up DNA from the surrounding fluid. or gene cloning occurs when DNA is produced from an RNA template.
- 10- Putting a human gene into the plasmids of bacteria has enabled scientists to insert the corrected gene into patients who have certain genetic disorders.

- Q-2 A.** 1- Three types of ends produced by type II restriction enzymes----,-----,---- (3 marks)
2- What do you expect of cutting at a catfish genome of 8×10^9 bp If you digest with 4-6 or 8 bp cutters, restriction enzymes? (5 marks)
3- Isochemers are..... (1 mark), Why methylase is important for bacteria? (1mark)

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

- 1- The lowest and higher levels of chromosome organization.
- 2- Direct and mediated gene transfer.

Q3: Discuss all the following : (20 Marks)

- 1- Heterochromatin and Euchromatin.
- 2- Requirements for transformation
- 3- Reporter gene-mediated selection.
- 4- Stability of transgen expression.

Prof. Yahia Othman

Dr. Ashraf Elsayed



Final Examination in Botany
First Term: Jan. 2014

Educational Year: Fourth Year

Program (Branch): Microbiology

Subject:

Fermentation and Fermentation Industry

(403 م)

Time: 2 hrs

Date: 01 /01 /2014

Full mark: 60

Question mark: 20 points

Answer the following questions:

- 1 Answer each of the following questions as requested (20 marks)
- 1-What are the factors considered during feeding & inoculation via fermentation process. (4 marks)
 - 2-What are the advantages of Chemostat, Antifoaming agents, bacteriocins and Fermenter Jacket? (4 marks)
 - 3-If yeast cells are used to make a carbonated soft drink, would alcohol still be produced? (3marks)
 - 4-Describe the manufacturing process of yoghurt with special reference to starter culture, its percent & mechanism of action, Name the chemical additives & state its role, Effect of starter culture on milk composition & Yoghurt significance. (6 marks)
 - 5- What is the difference between aerobic and anaerobic fermentation? (3 marks)
- 2 A) Choose the most correct answer(s): (10 marks)
- 1-Autotrophs that utilize light as their energy source are
a- fungi. b- photoautotrophs. c- chemo-synthetic autotrophs. d- consumers.
 - 2-Fermentation is the...
a-mass controlled culture of microbes to synthesize products.
b-production of alcoholic beverages by bacteria.
c-use of microbes in pollution control.
d-all of the above.
 - 3-The production of substances in industrial microbiology occur in the sequence:
a-fermentation, downstream processing, removal of waste, inoculation.
b- inoculation, downstream processing, fermentation, removal of waste.
c- inoculation, fermentation, downstream processing, removal of waste.
d- removal of waste, inoculation, fermentation, downstream processing
 - 4-Secondary metabolites
a-are essential to microbe function.
b-are by-products of metabolism that are not important to microbe function.
c-are products that require additional processing before they can be packaged.
d-are harvested during the exponential phase of growth.
 - 5-Yeast cells prefer aerobic conditions to multiply in number.
a-true b-false
 - 6-The aim of industrial microbiology is to produce chemicals that can be purified and packaged for sale or used in other commercial processes.
a-true b-false
 - 7- Microorganisms used for alcohol production
a. *Saccharomyces cereviceae*, b. *Bacillus subtilis*, c. *Penicillium chrysogenum*
d. None of these
 - 8-Submerged fermentations are
a. Batch fermentation, b. Continuous fermentation, c. Both a and b
, d. None of these

Examiners:

Prof. Dr. Yehia Ellazeik

Prof. Sami Shabaan,

Dr.

Ahmed Elshobaky, Dr. Ahmed Abdo



Final Examination in Botany
First Term: Jan. 2014

9- Industrial microbiology, mainly depends on the phenomenon of
a. Pasteurisation, b. Fermentation, c. Vaccination, d. Both b and c

10- Batch fermentation is also called

a. Closed system, b. Open system, c. Fed-batch system, d. None of these

B) Describe the relation between K_La and the liquid volume, baffles and surface area of a flask during a submerged fermentation process. (5 marks)

C) Compare between the heat delivery system in both bench top and pilot scale bioreactors. (5 marks)

3 A) Write short notes on the following: (10 marks)

- 1- Oscillatory Baffled Reactors. (4 marks)
- 2- Set-point and Dead-band for pH control. (3 marks)
- 3- Solenoid valve. (3 marks)

B) Compare between Axial Flow and Radial Flow impellers. (10 marks)

Examiners:	Prof. Dr. Yehia Ellazeik Prof. Sami Shabaan, Dr. Ahmed Elshobaky, Dr. Ahmed Abdo
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Final Examination in Botany
Jan. 2014

Educational Year: Fourth Level Program (Branch): Microbiology

Subject: (٤٠٦ م) Course(s): Genetics

Time: 2 hrs Date: 12/ 1 /2012 Full mark: 60

Question mark: 20

Answer the following questions:

Q.1 A- "colour 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- Skin colour in man.

2- Coat colour in rabbits.

Q.2 Fill in the spaces using suitable words or phrases: (20 marks)

1- Genes located on Y-chromosomes only are called

2- The Himalayan rabbit changes fur colour when the changes.

3- The appearance of yellow fats in rabbits depends on two factors.....and

4- In sex linked genes, the reciprocal cross gave results.

5- The genes located on x and y chromosomes are called.....

6- Diabetes mellitus disease affected by.....

7- The gene has three or more allelic forms occupy the same locus on the homologous chromosomes are known as

8- External environmental effects on gene expression such asand

9-..... epistasis modifies the Mendelian F2 ratio into (13:3).

10- Based on Mendel experiments, he put two important principles or laws, these are and

11- F2 ratio 15:1 indicatesepistasis.

12- The external feature of a character is termed

13- In test cross if the ratio of offspring is 50%: 50% the individual is

14- individuals have similar alleles, whereas individuals have different alleles.

15- F2 phenotypic ratio in agouti colour of mice is.....

16-epistasis modifies the Mendelian F2 ratio into (12: 3: 1).

Q.3 Write a brief notes on each of the following:

1- Recessive lethal genes.

2- Complementary genes.

3- Inheritance of comb shape in poultry.

4- Incomplete dominance and incomplete epistasis.

(20 marks)

Examiners:

Prof.Dr/ Magda Soliman

Dr/ Rehab Rizk

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Final Examination in Botany

First Term: Jan. 2014

Educational Year: 2013- 2014

Program (Branch): Microbiology

Level 4

Subject: Botany

Course(s): Mycology and phytopathology (M405)

Time: 2 hrs Date: 12 /1 /2014

Full mark: 60

Question mark: 20

Answer the following questions:

Q1: Give an account on each of the following:

- a- Essential considerations of plant disease management (5 marks)
- b- Identification of Etiolation , Hypertrophy, Epidemiology, Variegation and Symptoms (5 marks)
- c- Classification of plant diseases (5 marks)
- d- Disease control by Exclusion of the pathogen (5 marks)

Q2 : Using illustrative diagrams describe each of the following:

- a- Pectinases as pathogen weapon (6 marks)
- b- Direct penetration of intact host surfaces (4 marks)
- c- Histological defense structures (6 marks)
- d- Hypersensitive response(HR) as a defense mechanism (4 marks)

Q3 : Give an account on each of the following:

- a- Koch's postulates (4)
- b- Infected host as a reservoir of inoculum (6)
- c- Disease triangle (6)
- d- Factors that adversely affect normal plant functions (4)

Examiners :

Prof. Fatma Migahed

Dr. Hoda Soliman

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Final Examination in Botany

First Term: Jan. 2014

Level: 4th Level

Program : Microbiology

Subject: Microbiology (M 401)

Course(s): Physiology of Microorganisms

Time: 2 hrs. Date: 15 / 1 / 2014

Full mark: 60

Question mark: 20

Answer the following questions:

1- Explain and illustrate each of the following:

A- Metabolic pathways of the bacterial utilization of lactose as carbon source (10 marks)

B- Assembly of the fungal wall at the hyphal apex, with special reference to chitin biosynthesis (10 marks)

2- Discuss each of the following:

i- Microbial breakdown of cellulose (10 marks)

ii- Mechanism of Apical growth in fungi (10 marks)

3- A. How are sugars generated from nonsugar substrate? (10 marks)

B. Demonstrate fungal adaptations for nutrient capture in fungi? (10 marks)