

COURSE
TITLE

MICROBIAL BIOTECHNOLOGY

COURSE CODE: BT4202

DATE: 31/12/2020

GRADUATION
REQUIREMENTS

TOTAL ASSESSMENT MARKS: 150

TIME ALLOWED: 2 HOURS

Answer the following question

First question: Give reason(s) for (40 marks)

- 1- Priority of enzymes as biological detergent.
- 2- Bacteria protease is more favorable than fungal protease for dehairing of goat skins in the tannery.
- 3- The need to produce lactose-free milk
- 4- The partial neutralization of the free itaconic acid during fermentation process.
- 5- Enzymatic desizing is the most widely used method for the removal of starch.
- 6- Fungal α - amylase is superior to bacterial α - amylase in bread making.
- 7- Production of itaconic acid requires very low pH
- 8- Lime is added to the culture medium during citric acid recovery
- 9- All new enzyme preparations developed are of microbial origin.
- 10- Microbial proteases are used increasingly in cheese making as a substitute for natural rennet

Second question: Chose the correct answer (30 marks)

1) The most important nutrient factors affecting fermentation process

- a) Carbon source b) Nitrogen source c) Minerals d) All of above

2) Strain maintenance is to preserve the strain from

- a. Death b. Contamination c. Loss of acquired characters d.all of the above

3) The penicillin produced in large scale submerged fermentations is

- a) Penicillin-A b) Penicillin-D c) Penicillin-J d) None of these

4) The most effective antibiotic available for the systemic treatment of fungal infections of skin

- a. penicillin b. cephalosporin c. streptomycin d. None of these

5) *Aspergillus niger* is used generally for the production of

- a. Ethanol b. Penicillin c. Itaconic acid d. None of these

6) 6-amino penicillic acid is prepared from penicillin by

- a) Acylase b) Penicillinone c) Penicillin acylase d) None of these

7) Submerged fermentations are

- a) Batch fermentation b) Continuous fermentation c) Both a and b d) None of these

8) By product of cornstarch manufacture is

- a) Sugar can syrup b) Beet molasses c) corn steep liquor d) None of these

9) Cellulase enzyme is used in

- a) Removal of cell walls b) Production of lignin c) a and b d) None of these

10) All of the following are not involved in bioethanol production except

a) Inducer

b) Cooling coil

c) Antifoam

d) yeast

Third question: Compare between the following (40 marks)



1. Penicillin and cephalosporin
2. Primary and secondary metabolites
3. Microbial and chemical transformation of steroid
4. Native and semisynthetic penicillin
5. Crude and refined media

Fourth question: Check \checkmark or X for the following sentences (40 marks)

1. Constitutive enzyme are produced in response to addition of a particular substance ()
2. Purity of the product depend on the nature of Use ()
3. Production of citric acid requires a low pH ()
4. The main precursors for the production of Penicillin G is phenylacetic acid ()
5. Active penicillin production is associated with lactose and ammonia utilization ()
6. The use of immobilized enzymes is an alternative method for penicillin production ()
7. Quality control of the product is determined by the cost and purity ()
8. Griseofulvin is one of beta- lactam antibiotics ()
9. Microbial fermentations are used to produce inorganic acids ()
10. The native penicillin is potent enough for clinical use ()
11. Penicillinase is an enzyme used commercially to produce semisynthetic penicillin ()
12. Overheating of fermenter during fermentation is controlled by cool air ()
13. A major ingredient of penicillin production media is Corn meal ()
14. Amino acid and nucleotides are Secondary metabolites ()
15. The composition of the fermentation medium must include Precursor ()
16. Primary metabolites have no obvious role in the lives of the organisms ()
17. Gluconic acid is used as a pharmaceutical to supply calcium to the body ()
18. Industrial microbiology, mainly depends on the fermentation phenomenon ()
19. Keeping the acquired characters over a long time called strain stability ()
20. Citric acid used in used in leather tanning ()

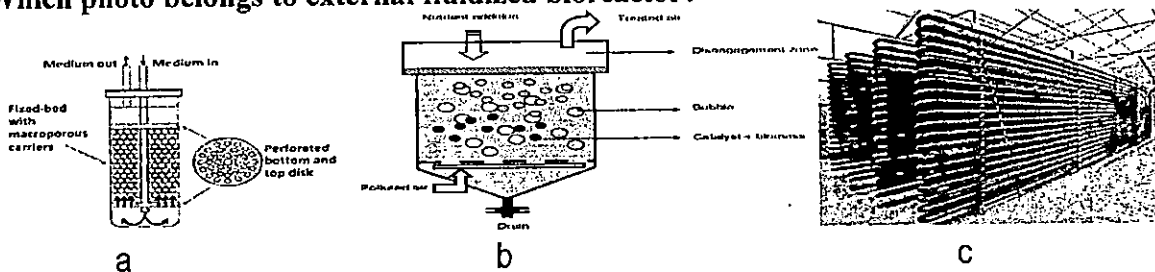
With my best wishes

EXAMINER	MOHAMED YASER BEDAIWY
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	Tanta University, Faculty of Science, Department of Botany			
	Theoretical Examination for Fourth Year Students of Industrial Biotechnology Program			
	Course Title: Bioreactors	Course Code: BT421		
Date: Feb 2021	First Semester	Total Assessment: 60 M	Allowed Time: 2 Hours	

Question one: Fill in the correct answer from MCQ or True & False in your provided bubble sheet form (15 marks)

- In packed bed bioreactors:**
 - Separation of the biocatalyst is easy
 - Not suitable for wastewater engineering
 - No clogging of particles
- A sparger acts as:**
 - Mixing up the nutrients and microorganisms uniformly
 - Supplier of oxygen into the culture medium
 - Mixer for bubbles
- Stirred tank bioreactors are:**
 - Used for batch processes
 - Used for immobilized cells or enzymes
 - Without any mechanical stirring
- Bioreactors are used to produce:**
 - Microbial biomass and metabolites
 - Plants and animals
 - Recombinant products
 - a, & c
- Which photo belongs to external fluidized bioreactor?**



- Between the drawbacks of using open pond systems for algal culturing is:**
 - Culture infection.
 - Turbulence rate.
 - CO₂/O₂ release.
 - Light and dark cycles.

- Photobioreactors for algal culturing have many advantages over open pond systems because:**
 - Controlled conditions.
 - Minimized contamination.
 - Low water evaporation.
 - All mentioned.

8- Among the methods used for scaling-up large photobioreactors are:

- Genetic engineering manipulation of microorganism's strains.
- Using modularization methods.
- Using computational fluid dynamics (CFD).
- b & c.

9- Autotrophic cultivation mechanisms are beneficial for algal cultivation because they can:

- Minimize thermal stratification effects.
- Produce valuable biomass quantities.
- Increase greenhouse gas CO₂ emission.
- Consume more O₂ from the atmosphere.

- 4- Mixotrophic mechanism for culturing microalgae.
- 5- Tubular photobioreactor kinetics.
- 6- Algal biorefinery integral approach for producing valuable products from culturing microalgae, use for example wastewater treatment.
- 7- Light attenuation effect in a photobioreactor algal culture and its relation to the average irradiance concept (I_{av}).



Question Four: Write on the following topics (15 marks, each of 3)

- 1) Mention the 3 phases of the lignocellulose conversion into high valuable products in the bioreactors?
- 2) What is the solution of the issue that has been raised in the agricultural market by using of crops as renewable sources of energy and compounds, which in turn increased the lands subtracted to the food production and rising global food prices?
- 3) Compare between defined, complex and natural media?
- 4) Describe the process scheme of the citric acid production?
- 5) Mention the molecular and process tools for bioprocess optimization with *Yarrowia lipolytica*?

End of the questions

Best wishes from

Prof A. El-Shanshoury, Dr. G. Iemail and Dr. M. El-Shetahy

	Tanta UNIVERSITY, Faculty of Science, Department of Botany			
	Final Examination for (Forth Year) Students of Industrial Biotechnology			
	COURSE TITLE: Plant Biotechnology		COURSE CODE: BT427	
DATE: 3 MARCH, 2021	TERM: FIRST SEMESTER	TOTAL ASSESSMENT MARKS: 60	TIME ALLOWED: 2HOURS	

Part A:

Q1: Choose the correct answers

(15 Marks)

1. Flavr Savr tomato was created by using _____.
a. sense technology c. DNA replication
b. antisense technology d. None of these
2. Resistance to plant pathogen can be evaluated in the absence of disease using molecular markers.
a. True b. False
3. Which of the following vectors is used in crop improvement and crop management?
a. Bacteriophage c. Cosmid
b. Plasmid d. Ti-plasmid
4. Modern plant breeding is time-consuming and depends on environmental conditions.
a. True b. False
5. Genes were obtained from the daffodil in the development of golden rice.
a. True b. False
6. Cereals tend to be high in lysine.
a. True b. False
7. To manipulate plant chromosome combinations there are _____ procedures.
a. two b. four c. three d. five
8. For a convenient transformation system, _____ can be used for gene silencing.
a. antisense RNA c. either antisense RNA or transposon insertion
b. transposon insertion d. transposon insertion followed by antisense RNA
9. Domestication of plants is _____ selection process conducted by humans.
a. natural b. artificial c. spontaneous d. all of these
10. *In vitro* techniques may be used to generate diversity and produce hybrid plants.
a. True b. False
11. Cry genes have been grouped into 16 distinct groups code for _____.
a. 130 kDa or 50 kDa c. 100 kDa or 70 kDa
b. 120 kDa or 50 kDa d. 130 kDa or 70 kDa
12. Plant explants must produce acetosyringone to induce *vir* genes.
a. True b. False
13. The most frequently employed plant-breeding technique is _____.
a. outbreeding c. inbreeding
b. hybridization d. all of these
14. Most plants have been transformed using *particle bombardment*.
a. True b. False
15. The causative agent of the hairy root diseases is _____.
a. *Agrobacterium tumefaciens* c. *Agrobacterium rhizogenes*
b. Both a and c d. None of these

Continue to the next page

Q2: Compare between the following:

(15 Marks)

- a. Classical and modern breeding
- b. Two approaches for development of insect-resistant plants.
- c. V- and T- GURT

Part B:



Answer the following question. (30 marks)

- As you will be graduated within the next few months, and get your Bachelor degree in Industrial Biotechnology, suppose that you have found an international job announcement that asks the applicants to present a **proposal** that illustrates the scientific background and the experimental procedures that would be followed up to produce transgenic crop plants that have improved tolerance to environmental challenges including abiotic and biotic stresses.
- In the light of what you have studied in this course and throughout your program, **prepare this proposal** in a way that would make the company's selection committee to pick up you from many other applicants to get this valuable job.
- Support your illustrations with successful trials of producing stress tolerant transgenic crops when transformed with specific genes.
- Consider that the company announcing this job advertisement is focusing on the production of crops that are tolerant to global warming associated stresses including high temperature, drought and salinity.
- While answering this question, consider the allowed time and the available space in you answer booklet.

With best wishes

Prof Dr. Reda Gaafar

Prof Dr. Nasser Sewelam

	TANTA UNIVERSITY, FACULTY OF SCIENCE, DEPARTMENT OF BOTANY			
	FINAL EXAMINATION FOR THE FOURTH YEAR (BIOTECHNOLOGY)			
	COURSE TITLE	APPLIED MICROBIOLOGY	COURSE CODE: BT 425	
DATE: 20 / 01 / 2021		TOTAL ASSESSMENT MARKS: 60	TIME ALLOWED: 2 HOURS	

Answer the following questions:

Question 1: Complete the following sentences (15 marks)

- A- Existence of Xenobiotics this may be return to 1- 2- and
- B- The phenomenon of Biomagnification is.....
- C- Toxicogenicity is
- D- Many protein toxins consist of two components: 1-..... 2-
- E- Mineralization is defend as
- F- Composting is
- G- Types of starter cultures are including: 1- 2-3- and

Question 2: (15 marks)

- A- What is Criteria of organism used in Biodegradation? (3 marks)
- B- What happens after administration of live/attenuated vaccines? (3 marks)
- C- Write on the methods used to pasteurization and types of dehydrated milk? (4 marks)
- D- Explain how prepare the tetanus toxoid (TT) and how tetanus toxoid works? (5 marks)

Third question (18 marks)

1. Give reason(s) for (10 marks)
 - A. Importance of cooling coil during some fermentation Processes.
 - B. Difficulties facing the production of bio-ethanol by the traditional method.
 - C. All new enzyme preparations developed are of microbial origin.
 - D. Advantages of using amylase enzyme in the desizing process
 - E. Griseofulvin is the most effective antibiotic for the systemic treatment of fungal infections of skin, hair, and nails

2. Compare between the following (8marks)



- A. Crude and refined media
- B. somatic cell and germ line gene therapy
- C. Microbial and chemical transformation of steroid

Fourth question (12 marks)

Using Schematic diagram only, explain the following

- A. Production of insulin with recombinant DNA technology
- B. Production of bioethanol from agriculture wastes
- C. Recovery of penicillin from culture medium
- E. Different generations of cephalosporin

EXAMINERS	PROF. DR. MOHAMMED YASER BEDAIWY
	PROF. DR. SOBHY ELSILK

	Tanta UNIVERSITY, Faculty of Science, Department of Botany		
	Final Examination for (fourth Year)		
	Course Title: Forensics Biotechnology	Course Code: BT429	
Date: March 17, 2021	First Semester	Total Assessment Marks: 60	Allowed Time: 2 Hours

This exam consists of 4 sections. Take the time to read the questions carefully before answering.

Section one (30 Marks)

Answer all questions.

1- Allelic ladder represents the:

- A. DNA fingerprinting
- B. Fluorescence Imaging
- C. Mixture of the common alleles
- D. Slab gel electrophoresis

2- Common DNA Extraction Techniques represents the following except:

- A. Phenol chloroform extraction
- B. Solid phase reversible immobilization extraction
- C. Chelex extraction
- D. Restriction fragment length polymorphism

3- A convict whose family or relations was not known and no biological sample was available with jail authorities, escaped from the jail. A dead body resembling the convict was found in nearby forest, but due to burn of his face, identity could not be established. The positive identity that he is the same convict who escaped from jail can be established by:

- A. Blood grouping
- B. DNA profile
- C. Serology
- D. Fingerprint and knee print

4- In Retinal scan all of the following is true except:

- A. Scan is the capillary pattern in the retina
- B. Scan requires close contact of user
- C. Subject must focus on a little yellow light
- D. Subject must avoid blinking

5- Inconclusive or uninterpretable DNA results may be due to all factors except:

- A. Multiple contributors
- B. Contamination
- C. Partial degradation
- D. Lost biological evidence

See next page.....

6-Fraction of our DNA that differs between people and makes us unique Individuals:

- A. 0.1%
- B. 1%
- C. 10%
- D. 5%

7- Statement NOT true about postmortem staining is:

- A. Disappears within 24 h with discoloration
- B. Seen only in dependent parts
- C. Appears immediately after death
- D. Not seen in parts tied with a tight cloth or at pressure point

8- Postmortem lividity is useful to access:

- A. Type of wound
- B. To know the weapon used
- C. Position of the body after death
- D. All of the above

9- Amelogenin system means:

- A. A system for DNA extraction
- B. A gene located on Y and X chromosomes
- C. DNA from fungal and bacterial sources
- D. Separation of the amplified STRs

10- Tache noire is:

- A. Postmortem calorificity
- B. Change in eye after death
- C. Postmortem lividity
- D. None of the above

11-In a cut wound, all of the following are true except:

- A. It has clean-cut margins
- B. Bleeding is generally less than in lacerations
- C. long than deep.
- D. Length of injury does not correspond with length of blade

12-Following is an early sign of death:

- A. Rigor mortis
- B. Adipocere formation
- C. Putrefaction
- D. Mummification

13- False positive for amylase test include all the following except:

- A. Bacteria
- B. Plants
- C. Vomit
- D. Semen

See next page....

14-Over dead body, maggots appear in the stage of :

- A. Mummification
- B. Putrefaction
- C. Post mortem cooling
- D. Flaccidity

15-The average cooling rate in north pole is about:

- A. 0.5 – 1.5 °C/h
- B. 3 – 5 °C/h
- C. 2 – 3 °C/h
- D. 1-1.5 °C/h

Section two(14 marks)

This section of the exam consists of a crime scene case. Take time to read the case carefully before answering the questions below.

Answer all questions.

The Forensic Medical Authority was informed after finding unknown female dead in the desert at 5 am 15-1-2014. The coroner moved to examine the body at 6 am. By examination of the corpse we found the body was fully dressed and lying on her face, with presence of suicidal note within the clothes. The body was in complete rigidity with complete contraction of the right hand which was holding foreign hair, the hypostasis was dark, fixed and in the back. The temperature of the body was 12 ° C; air temperature was 12 ° C also. With cut wrist of left hand with no vitality, and vital finger nail abrasions at right and left side of the neck and upper inner aspect of the thigh, bite marks on her breast. By examination of the place we found bloody sharp knife under the corpse, Shoes and tire prints around the corpse. With no signs of struggle or blood around the corpse. At the autopsy we found broken hyoid bone and laryngeal cartilages with presence of all the signs of asphyxia.

Answer the following questions

1-When this woman died? Why? (5marks)

2- What is the cause of the death in this case? Why?(4 marks)

3- What are the samples that must be taken in such a case? Why? (5marks)

Section three (12marks)

This section of the exam consists of four essay questions. Answer three of them.

State what you know about :

1-Facial reconstruction (4 marks)

2- Causes of death from burning(4 marks)

3-Advantages of STRs typing in forensic medicine (4 marks)

4-Advantages of PCR in forensic molecular biology(4 marks)

See next page....

Section four (4marks)

This section of the exam consists of one assay question. Answer it:

-A family came to our lab for DNA typing for a case of disputed paternity tell them about the result of DNA testing.(4 marks)

Locus	Sample type: blood From Father		Sample type: Blood from Wife		Sample type: Blood from Son	
	Alleles	Alleles	Alleles	Alleles	Alleles	Alleles
D8S1179	16	16	10	15	10	13
D21S11	28	32.2	29	32.2	30	32.2
D7S820	8	8	8	10	8	9
CSF1PO	14	15	12	13	12	12
D3S1358	17	19	17	19	15	17
TH01	7	9	8	8	8	9.3
D13S317	11	13	11	12	9	11
D16S539	10	10	9	11	11	12
D2S1338	18	16	19	19	17	19
D18S433	12	14	14	14	14	14
VWA	17	17	16	17	16	17
TPOX	8	8	8	8	8	8
D18S51	16	16	18	16	18	17
Amel	X	Y	X	X	X	Y
D5S818	9	11	10	11	11	12
FGA	21	25	25	27	22	25

(Good Luck)

Examiners:

Dr/ Jihan Ahmed Abd Elwahab

Dr Prof/Reda Mohamed Gafar

Dr/ Mohamed Halaw