
	Tanta University, Faculty of Science, Department of Botany			
	Final Examination for (4th Year) Students of Microbiology			
	COURSE TITLE:	<u>Microbial genetics</u>	COURSE CODE: BO4121	
DATE: 31/12/2022	2022	TOTAL ASSESSMENT MARKS: 100	TERM: First	Time allowed: Two hours

Answer the following questions:

Question1: The directional flow of information from DNA → RNA → protein is known as the central dogma of molecular biology. (25 marks)

- Mention the name of the process of going from RNA to a functional protein.
- How a particular segment of DNA is copied into RNA?
- Define each of the following: Antisense strand – Anticodon.
- Name the most important phenomena of mutation in microorganisms.
- Compare between each of the following: Genotype & Phenotype – Start codons & Stop codons.

Question2: Mutation can affect anywhere from a single DNA building block (base pair) to a large segment of a chromosome. (25 marks)

- Define Denovo-mutation.
- Compare between Germ line & somatic mutations.
- Tay-sachs disease & Down syndromes are genetic disorders. "Prove this statement"
- Mention types of mutation according to survival of an organism.
- Write the ratio appearance of Sickle cell anemia in the next generation if the two parents are carriers.

Question3: Different kinds of mutation. (25 marks)

- Write the complementary mRNA strand and translate the amino acid sequence that will be produced from the normal and mutated DNA sequences below using genetic code.

Normal DNA sequence

3`-TACATGGTCAGCTAATGGATC-5`

Mutated 1 DNA sequence

3`-TACATAGTCAGCTAATGGATC-5`

Mutated 2 DNA sequence

3`-TACATCGTCAGCTAATGGATC-5`

Mutated 3 DNA sequence

3`-TACTTGGTCAGCTAATGGATC-5`

		Second Letter								
		U		C		A		G		
1st letter	U	UUU	Phe	UCU	Ser	UAU	Tyr	UGU	Cys	3rd letter
		UUC		UCC		UAC		UGC		
		UUA	Leu	UCA		UAA	Stop	UGA	Stop	
		UUG		UCG		UAG	Stop	UGG	Trp	
C	CUU	Leu	CCU	Pro	CAU	His	CGU	Arg		
	CUC		CCC		CAC	Gln	CGC			
	CUA		CCA		CAA		CGA			
	CUG		CCG		CAG		CGG			
A	AUU	Ile	ACU	Thr	AAU	Asn	AGU	Ser		
	AUC		ACC		AAC		AGC			
	AUA		ACA		AAA	Lys	AGA	Arg		
	AUG	Met	ACG		AAG		AGG			
G	GUU	Val	GCU	Ala	GAU	Asp	GGU	Gly		
	GUC		GCC		GAC		GGC			
	GUA		GCA		GAA	Glu	GGA			
	GUG		GCG		GAG		GGG			

Please, continue to the following paper sheet



- b) Mention type of mutation in each sequence.
- c) Which mutant do you think will work the most like normal protein? Why?
- d) Which mutant will change protein function?
- e) Which mutant cause transition mutation?

Question 4: Mutagens (25 marks)

- a) Mention the name of the first scientist who discovered an oncogenic virus as a biological mutagen.
- b) Ethidium bromide and 5-bromouracil are considered as chemical mutagens. "Prove this statement"
- c) *H. Pylori* as a microbial gastric mutagen and carcinogen. "Prove this statement"
- d) Compare between: Formation of thymine dimer & Alkylation of guanine.

Best Wishes

Assistant Prof. Dr. Nessma El Zawawy

	Tanta University Faculty of Science Department of Botany		
	Theoretical Examination for 4th Year Students of Chem/ Botany		
1969	Course Title: Physiology of Algae	Course Code: BO 4123	
Date:	January 9/ 2023	Term: 1	Total Assessment Marks: 100 Time Allowed: 2h.

Question 1: Give short accounts on the followings (30 marks)

- 1- Chemical structure of Cyanocobalamin (vitamin B₁₂) and its function for algae.
- 2- Algal cultures in photobioreactors: uses, advantages and disadvantages.
- 3- The structure and function of chlorophyll molecule.
- 4- Stationary phase in the standard algal growth curve.
- 5- Light and combined nitrogen as factors affecting N₂ fixation in algae.
- 6- Photo-assimilation of acetate by algae.

Question 2: Complete the following sentences (20 marks)

- 1- Auxotrophic algae are.....
- 2- Xanthophyll pigments in algae are.....
- 3- Heterotrophy is defined as.....
- 4- Chlorophyll C is characterized by.....
- 5- Nitrogenase enzyme is inhibited by.....
- 6- Factor B is formed by.....
- 7- A continuous culture disadvantage is.....
- 8- Phycobiliproteins pigments are.....
- 9- Importance of Fe for algal growth is.....
- 10- A batch culture advantage is.....

Question 3: Correct the underlined words on the followings (15 marks)

- 1- The chlorophyll is extracted using chloroform and then identified by weighing.
- 2- Zinc and potassium are inorganic elements fused in the nitrogenase enzyme structure.
- 3- Closed algal cultures are easily exposed to contaminations.
- 4- The violaxanthin is the type of phycobiliproteins found in Rhodophyta.
- 5- Euglenophyta members are autotrophic algae while Chlorophyta are auxotrophic.
- 6- The inflow medium is added according to the generation time in batch culture systems.
- 7- Continuous cultures are used for mass production process like biodiesel.

- 8- **Stirring** is used to maintain the pH of an algal culture while **aeration** supplies it with energy.
- 9- Salinity is a controlling factor in **fresh water algal cultures**.
- 10- FAD and glutathione are needed for **nitrogen fixation process**.
- 11- In **chemotrophy**, light energy is converted into chemical energy of ATP and NADPH₂.

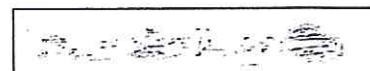
Question 4: Explain the mechanism of the following processes: (35 marks)

- 1- Photorespiration via glycolate pathway.
- 2- Nitrogen fixation in Cyanophyta.
- 3- Photodynamic effect and carotenoids pigments in photosynthesis.
- 4- Thiamine requirement in algal growth.
- 5- Formation of vitamin B₁₂ analogues.
- 6- Biological adaptation of algae to minimize photorespiration.
- 7- Growth of algae in continues culture systems.

End of Questions

All Best Wishes

Examiner Prof. Dr. Gehan Ahmed Ismail





Tanta University - Faculty of Science - Botany Department

Examination for Junior (4th Year Micro)

Course Title	التنوع الحيوي و المحميات الطبيعية		Course Code: BO 4125
Date	Jan 2023	Term: First	Total Assessment: 50 Marks (BO 4125)
			Time Allowed: 2 Hr

السؤال الأول:

قارن في جدول باختصار بين ما يلي: (٢٠ درجة)

- ١-تأثير المناخ علي العصور المختلفة، وتأثير العصور الحديثة والثورة الصناعية علي المناخ (٥ درجات)
- ٢-مستويات التنوع الحيوي المختلفة (٥ درجات)
- ٣-تنوع ألفا و تنوع جاما (٥ درجات)
- ٤-خصائص صون الحياة الفطرية الوصفية و خصائص صون الحياة الفطرية الكمية (٥ درجات)

السؤال الثاني:

عند قياس التنوع الحيوي لابد الأخذ في الاعتبار خصائص مميزه للقياس.. (١٠ درجات)

- ١-اذكر تلك الخصائص
- ٢-اذكر طرق قياس التنوع الحيوي

السؤال الثالث:

في ضوء دراستك للتنوع الحيوي ناقش باختصار ما يلي: (٢٠ درجة)

- ١-تنوع ابيلون (٥ درجات)
- ٢- يتأثر التنوع الحيوي بالوسط المحيط (٥ درجات)
- ٣-يمكن تقسيم الأنواع النادرة إلي ثلاث أقسام طبقا لتوزيعها الجغرافي. (٥ درجات)
- ٤-كيف يمثل التدخل البشري خطر علي التنوع الحيوي (٥ درجات)


مع تمنياتي لكم بدوام التوفيق والنجاح



لجنة الممتحنين والمصححين:

أ.د/ أحمد شرف الدين

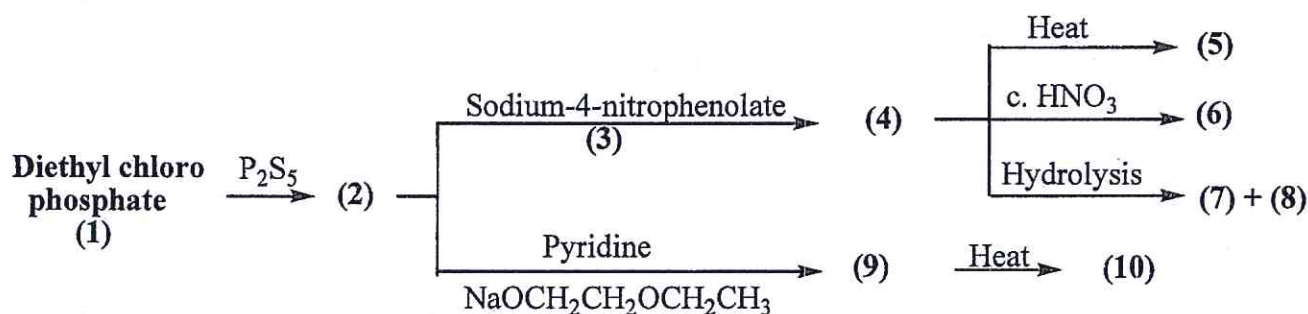
د/ سلمى شلتوت

	Tanta University, Faculty of Science, Chemistry Department		
	Examination for Fourth Level (Credit hours) Students		
	Course Title	Pesticides	Course Code: CH4119
Date:	4 January 2023	Total Assessment Marks: 50	Time Allowed: 2 hrs

I) Write about each of the following: (10 Ms):

1. The metabolism of DDT
2. Merits and demerits of organophosphorus pesticides
3. The metabolism of Carbofuran

II) Complete with chemical equations the following scheme and name all products: (10 Ms)



III) Write one method for preparation of the following pesticides: (10 Ms)

1. Nicotine
2. Ethyl chloro benzilate
3. Trialkyl tin hydroxide
4. Bis(4-chlorophenyl) sulphonate
- 5- Sodium fluosilicate

IV) Mark (✓) or (×) for the following statements (10 Ms):

1. The complete breakdown of Pesticides forms carbon dioxide, water and minerals ()
2. Nicotine is less toxic than its salts ()
3. Pesticides applied indoors usually breakdown at faster rate due to the lack of sunlight ()
4. γ -Isomer of gammexane is the most toxic isomer to the insect ()
5. Thiolo isomer of parathione is more effective as insecticides than the thiono isomer ()
6. Carbamates are the newest group of synthetic compounds with high insecticidal activity ()
7. Acute toxic effect arises from long term exposure to small quantities of pesticides ()
8. Contact poison depends on the action of stomach and consumed through mouth parts ()
9. Methyl parathion is hydrolyzed 4.3 times slower in alkali than parathion ()
10. Bordeaux mixture is a mixture of calcium sulfate and copper oxide ()

See the second page



Tanta University
Faculty of Science
Department of Chemistry

Final examination for 4th level of Microbiology (Special)

Course Title: "Instrumental 2"	Course Code: CH4171	Term: First
Date: 14 January 2023	Total Assessment Marks: 100	Time: 2 Hours

Question (1): Analyze the following statements as TRUE (✓) OR FALSE (X) and correct the wrong statements: [20 marks]

- 1) In reversed-phase HPLC; the non-polar molecules are retained in the column, and polar molecules moves down the column with mobile phase.
- 2) In molecular exclusion chromatography; the separation technique is based on the molecular size, and the stationary phase may be a cationic or anionic resin.
- 3) The relative solubility of solute in both phases determines the rate of movement of solvent.
- 4) Chromatography involves two mutually miscible stationary and mobile phases.
- 5) In Gas-liquid phase chromatography, the stationary phase is composed of gas, and the mobile phase is made of liquid.
- 6) The low crosslinking resin in the ion exchange chromatography has a small pore size.
- 7) Sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE) is one of the most powerful techniques to separate proteins based on their degree of polarity.
- 8) In normal phase HPLC; the stationary phase is polar, and the mobile phase is non-polar.
- 9) The isocratic elution process means addition of solvent mixture of fixed composition during the whole process.
- 10) In column chromatography; efficiency of solutes separation decreases as ratio length/ width increases.

Question (2): Choose the correct answer from the following choices: [16 marks]

- 1) In the partition chromatography, the separation process depends on _____
a) polarity b) solubility c) molecular size d) none of the above
- 2) In the affinity chromatography, the separation process depends on _____
a) polarity b) biological activity c) solubility d) none of the above
- 3) The speed of migration of ions in the electric field of the electrophoresis technique depends upon:
a) Shape and size of molecule b) Magnitude of charge and shape of molecule
c) Magnitude of charge, shape, and mass of molecule d) Magnitude of charge and mass of molecule
- 4) The degree of resolution of compounds in the GC technique depends upon:
a) column dimension b) flow rate of carrier gas c) size of sample components
d) all the above.
- 5) The separation principle of the thin layer chromatography (TLC) is based on ____ of compounds in the two phases.

Continue the next page

- a) different degrees in the polarity b) different degrees in the solubility c) different degrees in size
d) none of the above
- 6) In gas chromatography, the basis for separation of the components of the volatile material depends on the difference in _____
a) conductivity b) partition coefficients c) molarity d) molecular weight
- 7) In the electrophoresis technique; electrophoretic mobility of _____ molecules is _____ than the mobility of _____ molecules with the same charge density.
a) large, greater, and small b) small, greater, and large c) small, lower, and large
d) none of the above
- 8) Which of the following statements is true about migration of biomolecules in the electrophoresis chromatography;
a) the rate of migration is directly proportional to the resistance of medium
b) rate of migration is directly proportional to current
c) low voltage is used for separation of high mass molecules
d) rate of migration is inversely proportional to current
- 9) According to the theory of electrophoresis, Nucleic acids have a consistent _____ imparted by their backbone and migrate toward the _____ electrode
a) -ve charge, anode b) +ve charge, cathode c) -ve charge, cathode d) +ve charge, anode

Question (3): Write the scientific term of the following: [8 marks]

- 1) A technique for separating different molecules by differences in their isoelectric point.
- 2) The schematic diagram which, results from separation of components in the displacement elution technique.
- 3) The analyte material that appear from the chromatograph. It specifically includes both the analytes and solutes passing through the column.
- 4) Type of elution method in which, the solvent is kept in a trough at the top of the chamber and can flow down the paper or thin layer, by capillary action as well as by the gravitational force.

Question (4): Discuss in detail the following: [32 marks]

- a) Agarose gel electrophoresis for analysis of DNA (schematic diagram, principle of technique, advantages, and disadvantages).
- b) Types of development (elution) techniques.
- c) The two-dimensional (2D) gel electrophoresis technique.
- d) Factors affecting solutes separation in the column chromatography (CC).

Question (5): Compare between the following: [16 marks]

- a) Xero and Aero gels in Gel chromatography
- b) The flame ionization, and the thermal conductivity detectors (*the schematic diagram*)


Question (6): Write short notes about the following expressions: [8 marks]

- a) Retention factor (R_f) Value
- b) Radial chromatography

----- Good Luck -----

Prof. Dr. Tarek Fayed

Dr. Mona Elfiky


	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT CHEMISTRY			
	Final EXAMINATION for 4 th YEAR students of Botany and Microbiology			
	COURSE TITLE:	Biopolymer Chemistry البوليمرات الحيوية نبات وميكرو		COURSE CODE: CH4179
DATE:	2022 JANUARY 11TH	TERM: FIRST 2022	TOTAL ASSESSMENT MARKS: 50	TIME ALLOWED: 2 HOURS

Answer the following questions

- 1- Steps of free radical polymerization. 5 marks
- 2- Describe monomer, polymer, and oligomer. 5 marks
- 3- Types of free radical polymerization initiators. 5 marks
- 4- Define biopolymers and show some examples of types of biopolymers
5 marks
- 5- Write the chemical structure of the following biopolymers. 5 marks
 - i- Poly(3-hydroxybutyrate)
 - ii- Poly(lactide-co-glycolide)
 - iii- Poly(butylene adipate)
- 6- Describe the suspension emulsion technique 5 marks
- 7- Classification of Polymers according to applications 5 marks
- 8- Types of biopolymers. 7 marks
- 9- Write the sign (√) or (X) in the front of each statement: 8 marks
 - I) Synthetic polymers are human-made polymers. (.....)
 - II) Poly(lactic -co- glycolic) is a biopolymer (.....)
 - III) Gelatin is a biopolymer (.....)
 - IV) Biopolymers are not produced by living organisms (.....)

ا.د: ائرفاعي قناوي

امنياتنا بالتوفيق

	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF BOTANY			
	EXAMINATION FOR SENIOR (FOURTH YEAR) STUDENTS OF SPECIAL MICROBIOLOGY			
	COURSE TITLE:	YEASTS BIOLOGY	ACADEMIC YEAR: 2022-2023	COURSE CODE: MB 4101
DATE: WED.	28 DECEMBER 2022 ONE PAGE EXAM.	TERM: FIRST	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS.

I-Multiple choices (Circle the right answer); (20 Marks):

1. All mating pheromones lead to a transient arrest of cell division in their target cell cycle in
a) late G1 phase b) G2 phase c) S phase d) M phase
2. *Malassezia* yeast sp. form
a. unipolar conidia b. multilateral conidia c. ballistoconidia d. arthroconidia
- 3-*Rhodotorucine A* of *Rhodospiridium toruloides* biogenesis produced from multiple precursor genes termed a)RHA1 b)HA2 c) RHA3 d) All of the previous
4. DNA/DNA hybridization data are being used a) to show phylogenetic relationships in both the imperfect genera and species. b) To confirm the yeast identification at species level with reference species c) To determine the similarities between two yeast species d) All of the previous.
- 5- *Trichosporon beigeli* is a. the cause of white Piedra b. an ascomycete c. hardly detached from hair d. all of these choices
- 6- *Kloeckera* yeast species form a) bipolar annelloconidia b) Multilateral conidia c) Polar conidia d) Arthroconidia
- 7-*Pichia* form ascospore in shape of a) hat to saturn b) globose c) ovoid d) spherical
- 8- YIp, YEp, YRp, and YCp are a)Yeast plasmids b) Fungi plasmids c) bacterial plasmids
- 9-Yeast cell wall lacks a)Glucan b) Mannan c) Chitin d) lignin
- 10- Yeast Sources of taxonomic information is a) Universally distributed compounds in the cell b) Micro-Morphological alone c) DNA banding patterns of the non-coding DNA only d) all of the previous.

II- Put (✓) or (X) in front of each of the following sentences (20 Marks):

- a) *Rhodotorula* are usually readily recognized by their distinctive yellow to red colony color
- b) *Cryptococcus neoformans* cause disease known as cryptococcosis
- c) M-factor of *Schizosaccharomyces pombe* is linear nonapeptide with S-farnesyl methyl cysteine as the carboxy-terminal amino acid.
- d) Diplobiontic yeasts lifecycle characterized by shortening of diploid stage, being confined to the zygote cell.
- e) The pheromone signal is transmitted from receptor via G protein.



III- Write on each of the following (40 Marks):

- a) Yeast cell wall structure
- b) Efficiency of Dalmau Plate technique is as one of the basic criteria for the yeast classification?
- c) Importance of Germ tube test as tentative test for *Candida albicans* identification?
- d) Consequences of mating pheromone effects to opposite mating yeast cell?

IV- Explain briefly (20 Marks) :

- a) The life cycle of *Filobasidiella neoformans*? b- Embdon-Myerhof-parnas (EMP) pathway?
- b) Yeast Genomic library construction? d- General characters of Basidiomycetous yeast.

Prof.Dr.Yehia A.-G.Mahmoud

	TANTA UNIVERSITY, FACULTY OF SCIENCE, DEPARTMENT OF BOTANY			
	FINAL EXAMINATION FOR THE FOURTH YEAR (SPECIAL MICROBIOLOGY)			
	COURSE TITLE	MICROBIOLOGY OF SOIL	COURSE CODE: MB4103	
DATE: 4/01/2023	JUN, 2023	Total assessment Marks: 100	TIME ALLOWED: 2 HOURS	

Answer the following question

I. Select the correct answer (20 marks)

1. Which of the following cycles does not have a gaseous phase?
 - a. Carbon
 - b. Nitrogen
 - c. Phosphorus
 - d. None of these
2. In which cycle are bacteria important for processes other than decomposition?
 - a. Carbon
 - b. Water
 - c. Phosphorus
 - d. None of these
3. Predominant microbes in acidic soil
 - a. fungi
 - b. bacteria
 - c. Both a and b
 - d. None of these
4. Assimilative denitrification is done by
 - a. fungi
 - b. plants
 - c. prokaryotes
 - d. all of these
5. The diagnostic enzyme for nitrogen-fixing organisms is
 - a. nitrogenase
 - b. nitrate reductase
 - c. nitrate oxidase
 - d. none of these
6. Which of the following is a difference between a food chain and a food web?
 - a. Food chains involve only plants, while food webs involve animals.
 - b. Food chains involve only plants, while food webs involve both plants and animals.
 - c. Food chains involve plants and animals, but food webs involve only animals.
 - d. none of the above
7. Which are the main source of biofertilisers?
 - a. Cyanobacteria
 - b. Bacillus
 - c. Streptococcus
 - d. None of these
8. _____ play a key role in the transformation of rock to soil.
 - a. Cyanobacteria
 - b. Pectin decomposing bacteria
 - c. Nitrifying bacteria
 - d. Denitrifying bacteria
9. The nonsymbiotic bacteria which fix nitrogen live in the soil independently are
 - a. Azotobacter
 - b. Clostridium
 - c. Both a and b
 - d. all of the above
10. The physical structure of soil is highly improved by the accumulation of
 - a. mold mycelium
 - b. bacteria
 - c. water
 - d. all of these

II. Check ✓ or X for the following sentences

(20 marks)

- a) The surface layer of soil contains lower number of microorganisms
- b) Organic matter is derived from parent rocks/bed rocks through decomposition
- c) Non symbiotic microorganisms is involved In the process of nitrogen fixation
- d) The physical structure of soil is improved by the accumulation of minerals & water
- e) Anaerobic bacteria predominate in flooded soils
- f) psychrophiles involved in decomposition of compost piles
- g) Clostridium is not a biofertilizer producing microorganisms
- h) Soil water serves as a solvent and carrier of nutrients for the plant growth
- i) Only symbiotic bacteria have the ability to fix nitrogen from the air into the soil
- j) Cyanobacteria play a key role in the transformation of rock to soil

III. Type the Function / Role of following microorganisms in soil (20 marks)

- 1. Protozoa
- 2. fungi
- 3. algae

IV. Mention the following

(20 marks)

- 1. Methods for measuring the food web.
- 2. Different categories of soil composition.
- 3. Positive association between microorganisms in soil.



V. Only with a labelled diagram describe the following

20 marks

- 1. Distribution pattern of microorganisms in the soil
- 2. The importance of microorganisms to P availability in soil
- 3. The role of VAM on the productivity of plant

With my best wishes

EXAMINER	MOHAMED YASER BEDAIWY
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	TANTA UNIVERSITY, FACULTY OF SCIENCE, BOTANY DEPARTMENT		
Final Examination for fourth level Students (Chemistry/ Microbiology)			
Course title:	MICROBIAL BIOREMEDIATION		Course Code: MB4107
DATE: 25, JAN., 2023	TERM: FIRST	TOTAL ASSESSMENT MARKS: 50	Time Allowed: 2 hours

Answer the following questions:

Q1: Complete the following: (10 MARKS)
(Each space with 1 MARKS)

- 1-The aim of Kyoto protocol (1997) is
- 2-The rotating disc digester has two main advantages
and
- 3-The ideal percentage of carbon dioxide in the composition of the earth atmosphere is
- 4-Biohydrometallurgy includes two of bacterial activity
And
- 5- The process in which magnetic bacteria take up the magnetic material and then deposit the magnetite is called
- 6-The biodegradability of a compound depends on its,
..... and

Q2: Write short notes on Only Five of the following: (25 MARKS)

- 1-Addition of microorganisms or (DNA). (5 MARKS)
- 2-Degradation of polymers such as polyurethane. (5 MARKS)
- 3-Growth associated degradation of carbohydrates. (5 MARKS)
- 4-Bacterial succession in the polluted environment. (5 MARKS)
- 5-Beneficial effects of probiotics.(5 MARKS)
- 6-Biodegradation of Xenobiotics. (5 MARKS)

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تابع الأسئلة في الخلف

Q3: Compare between of the following:

(10 MARKS)

1-Methods used in waste water treatment.

(10 MARKS)

Q4: Explain Only One of the following:

(5 MARKS)

1-Interacting subsystems.

(5 MARKS)

2-Greenhouse gases and global warming.

(5 MARKS)

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Best wishes

Examiner

Dr. Maha Mahmoud Azab.