

Q# V: Choose the correct answer: (Answer 10 only)10 Marks

- (1) How does a nonsense mutation affect the mRNA transcript?
A) It increases mRNA stability
B) It introduces a stop codon that terminates translation
C) It changes the reading frame of the transcript
D) It causes exon skipping during splicing
- (2) Which of the following is an example of a palindromic DNA sequence?
A) 5'-AGCTT-3' B) 5'-AATTAA-3' C) 5'-GATATC-3' D) 5'-CGTAAC-3'
- (3) Why is the DNA denatured before hybridization in Southern blotting?
A. To increase the binding of restriction enzymes
B. To allow the probe to hybridize to single-stranded DNA
C. To degrade RNA contaminants
D. To increase DNA fragment size
- (4) What is the approximate melting temperature (T_m ($^{\circ}\text{C}$)) of a primer with the sequence 5'-GGAATTTTCCGCAATGGG-3' ?
A) 54 B) 58 C) 62 D) 60
- (5) What was the key conclusion of the Beadle and Tatum experiment using *Neurospora crassa*?
A) Genes are made of DNA, not protein B) One gene codes for one enzyme
C) DNA replication is semi-conservative D) Ribosomes are the site of protein synthesis
- (6) Which of the following is NOT a characteristic feature of tRNA molecules?
A) Contains an anticodon loop that pairs with mRNA codons
B) Has a 3'-CCA sequence for amino acid attachment
C) Has a cloverleaf secondary structure
D) Is translated into protein by ribosomes
- (7) Which enzyme is responsible for attaching amino acids to their corresponding tRNA molecules?
A) Peptidyl transferase B) RNA polymerase
C) Aminoacyl-tRNA synthetase D) Ligase
- (8) What is the function of the Rho protein in Rho-dependent termination of DNA transcription?
A) Binds DNA at the terminator site
B) Acts as an RNA polymerase inhibitor
C) Binds to RNA and moves toward RNA polymerase to unwind the RNA-DNA hybrid
D) Adds a poly-A tail to mRNA
- (9) Why is ethanol or isopropanol added to the DNA solution during extraction process?
A) To denature DNA B) To hydrolyze proteins
C) To precipitate DNA D) To dissolve cell debris
- (10) Cosmids are hybrid vectors combining features of:
A) Plasmids and bacteriophages B) Mitochondria and ribosomes
C) Viruses and proteins D) Introns and exons
- (11) Which type of DNA damage is caused by ionizing radiation (X-rays, gamma rays)?
A) Deamination of cytosine B) Single thymine dimer formation
C) Double-stranded DNA breaks D) Methylation of adenine

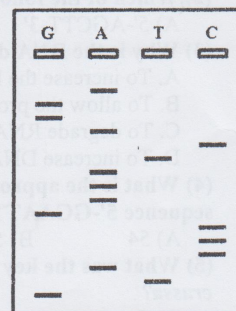
Best wishes, Dr. Mohamed Gomaa



Answer the following questions

Q# I:5 Marks

- (a) Given the following Sanger sequencing results, what is the correct sequence of the template DNA?
- (b) What is the principle of Sanger sequencing method?



Q# II: Identify 7 only of the following terms and write on their function(s):.....14 Marks

- (1) *Taq* polymerase
- (2) DNA proofreading
- (3) RNA primase
- (4) Operator
- (5) Spliceosomes
- (6) Housekeeping genes
- (7) Exons
- (8) Topoisomerases

Q# III: Write on the following: (Answer 4 only).....12 Marks

- What is the genetic code, and why is it said to be degenerate and universal?
- What are Okazaki fragments, and why are they formed on the lagging strand but not on the leading strand? What enzymes are involved in their processing?
- How to produce human insulin and viral vaccines using gene cloning?
- Why is DNA double-stranded and RNA single-stranded?
- How does UV light affect DNA structure, and what mechanisms cells use to repair UV-induced damage?

Q# IV: Write the scientific term for the following: (Answer 9 only).....9 Marks

- (1) The process of converting RNA into DNA.
- (2) A triplet of nucleotides on tRNA that is complementary to an mRNA codon.
- (3) Small, circular, extrachromosomal DNA molecules that can replicate autonomously in bacteria, making them excellent vectors.
- (4) Scientist who discovered that Adenine (A) pairs with Thymine (T) and Guanine (G) pairs with Cytosine (C) in equal amounts.
- (5) Specific sequence where DNA replication begins.
- (6) A term that describes that new DNA molecule contains one original strand and one newly synthesized strand.
- (7) The first amino acid in the translation of mRNA into polypeptide chain.
- (8) A point mutation in a DNA sequence that does not alter the amino acid types of the resulting protein.
- (9) The step in the PCR where the reaction temperature is lowered (usually to 50–65°C) to allow DNA primers to bind to the DNA template.
- (10) A site in ribosomes where empty tRNA leaves away.

12. There is one amino acid for one genetic code.
a. True b. False
13. Capping is done by the addition of
a. Methylated T b. Methylated A c. Methylated G d. Methylated C
14. mRNA of which of the following organism does not undergo processing?
a. Plant b. Human c. Bacteria d. Fungi
15. Which of the following does not take part in gene expression?
a. Transcription b. RNA processing c. Translation d. Replication
16. In the case of a circular DNA synthesis how many replication forks are observed?
a. 1 b. 2 c. 3 d. 4
17. Which of the following are purines of the nucleic acid?
a-adenine and guanine b. adenine and thymine c. adenine and cytosine d. cytosine and guanine
18. A 5-to-3 synthesis of DNA means that growth occurs by addition of dNTPs to the exposed 3-OH group.
a-true b-false
19. Restriction enzymes make
a. double- stranded breaks b. break in a single strand c. make primer d. ligation of broken strands
20. Which of the following nucleic acids does contain a genetic message
a. siRNA b. mRNA c. tRNA d. rRNA

Q2: Give the differences between 5 only (in table) of the following: (15 Marks)

- a-Eukaryotic and prokaryotic gene structure
- b- Ribosome structure in eukaryotes and prokaryotes
- c- DNA polymerase III and RNA polymerase II
- d-Monocistronic and multicistronic gene organization
- e-Leading strand & lagging strand
- f-Primary and secondary structure of DNA

Q3: Give the biological function of the following (5 Marks)

- a- Sigma factor b- helicase c- primase d- ligase e-aminoacyl synthetase

Q4: Write on two only of the following: (10 Marks)

- 1- Characters of plasmid vectors
- 2- Steps of gene cloning
- 3- DNA replication in prokaryotes

Best wishes Prof. Naeima Yousef



جامعة أسيوط

كلية العلوم

قسم النبات والميكروبيولوجي

Molecular Biology (206B)

Final Exam: 28th May 2025

2nd level (Biotechnology Students)

Time allowed: 2 hours

Answer the following:

(50 Marks)

Q1: Choose the correct answer: (20 Marks)

- Purines and pyrimidines form glycosidic linkage with the pentose sugar at the N1 position.
 - True
 - False
- Which of the following regarding the basic mechanism of gene expression is correct?
 - DNA $\rightarrow$ tRNA $\rightarrow$ protein
 - DNA $\rightarrow$ mRNA $\rightarrow$ protein
 - DNA $\rightarrow$ sRNA $\rightarrow$ protein
 - Protein $\rightarrow$ DNA $\rightarrow$ mRNA
- With respect to DNA replication which of the following enzyme is not correctly paired with its function?
 - Helicase – separate the double stranded DNA
 - DNA polymerase III – elongation of DNA strand
 - Primase – initiation of new strand synthesis
 - RNA polymerase II – elongation of DNA single strand
- The first amino acid present in the prokaryotic polypeptide is
 - Valine
 - Methionine
 - N-acetyl valine
 - N-formyl methionine
- During protein synthesis, what is the site of uncharged tRNA on the ribosome?
 - A
 - E
 - P
 - A, E and P
- Which of the following is not an essential feature for being a perfect vector?
 - Selectable marker
 - Origin of replication
 - Virulent gene
 - Restriction site
- How many origin of replication are present in the *E. coli* genome
 - 1
 - 100
 - 1000
 - Uncountable
- Which of the following is a component of the nucleic acid backbone?
 - Nitrogenous base
 - Pentose sugar
 - Amino acid
 - Hydrogen bond
- The joining of DNA is promoted by
 - Helicase
 - Ligase
 - Topoisomerase
 - Primase
- In Prokaryotes, Which of the following is responsible for the termination of transcription
 - Sigma factor
 - Promoter
 - Initiation site
 - Rho factor
- Polymerase used for PCR is extracted from
 - Saccharomyces cerevisiae*
 - Yeasts
 - Escherichia coli*
 - Thermus aquaticus*

The second question:-

(17 marks - 1.0 mark each)

Put (✓) beside the correct answer and put (X) beside the wrong answer:-

<i>Phoenix dactylifera</i> is belonging to family Arecaceae	()
Apocarpous condition refers to the presence of many united carpels	()
Axile placentation present in unilocular, bicarpellary ovary	()
Isostemonous stamens arranged in two whorls, outer whorl is opposite petals	()
Spiral arrangement is a primitive character	()
Colored bract called spathe is associated with spadix	()
Corymb with successive lateral branches develops on same side	()
Syconium is a dichasial cyme, which is reduced into two scorpioid cymes	()
Berry is a fruit which is commonly dry	()
Silique fruit splits open along two sutures, from apex to base	()
The aggregate fruit develops from a single flower	()
Takhtajan proposed a phylogenetic system for plant systematic	()
Brassicaceae is characterized by cross-like petals	()
The stem of family Cyperaceae is hollow, rounded	()
Scrophulariaceae sometimes has 5-bilabiate petals (upper & lower lip)	()
<i>Gossypium barbadense</i> is belonging to family Malvaceae	()
<i>Nerium oleander</i> is belonging to family Apocynaceae	()

The third question:- (15 marks)

- (i) Draw an illustration showing (4) types of racemose inflorescence (2 marks)
- (ii) Compare the following categories :- (4 marks)
- a. - Rosoideae & Pyroideae b. Mimosaceae & Fabaceae
- (iii) Describe the floral characteristics of family Papaveraceae with floral diagram. Enumerate 2 of the important plants. (4 marks)
- (iv) Give 1 botanical name and family of oil seed, vegetable, pulse, cereal & medicinal plants. (5 marks)

(ملحوظة : الاسم العربي للنبات ليس له درجات)

Best Wishes
Prof. Momen Zareh

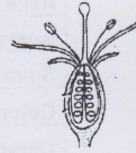


The first question:-

(18 marks)

Choose the correct answer, put your answer in the table: - (1.0 mark each)

1. Ovary of the corresponding picture is called: -
a. inferior b. superior c. semi-superior d. semi-inferior
2. The plant family that characterized by papilionaceous flowers is called:-
a. Fabaceae b. Caesalpiniaceae c. Mimosaceae d. Brassicaceae
3. The arrangement of sepals & petals in bud is known as:-
a. aestivation b. placentation c. duration d. modification
4. If the sepals become colored like petals, it is called as:
a. sepaloid petals b. petaloid calyx c. tepals d. perianth
5. non-functional stamens are called as:
a. staminal tube b. fertile stamen c. staminodes d. none of the preceding
6. A condition when filaments & anthers are fused is known as:-
a. syngenesious b. synandrous c. syncarpels d. adelphous
7. When dichasial cyme ends into monochasial cyme, it is called as:-
a. biparous b. cincinnus c. verticillaster d. uniparous
8. In raceme, the flowers arranged in succession called:-
a. basipetal b. acropetal c. centrifugal d. separate
9. Cymose inflorescence with many lateral branches bearing flowers is:-
a. monochasial b. dichasial c. polychasial d. verticillaster
10. Fruit with single seed and pericarp fused with testa is called:-
a. caryopsis b. achene c. urticle d. nut
11. Legume type of fruit is usually found in the family:-
a. Compositae b. Apiaceae c. Gramineae d. Fabaceae
12. The edible part of banana is:-
a. meso- & endocarp b. epi- & mesocarp c. epicarp d. pericarp
13. The seedless fruits are called:-
a. endocarpic b. schizocarpic c. parthenocarpic d. noncarpic
14. The correct scientific name of Mango (المانجو) plant:-
a. *Mangifera sp.* b. *Mangifera indica* c. *Mangifera indica* L. d. all the preceding
15. Four o'clock family that characterized by a petaloid tepals is:-
a. Lamiaceae b. Apiaceae c. Fabaceae d. Nyctaginaceae
16. Which of the following plants is belonging to family Chenopodiaceae:-
a. *Papaver somniferum* b. *Bougainvillea glabra* c. *Spinacia oleracea* d. *Gypsophila elegans*
17. The plant family that characterized by umbel inflorescence and inferior ovary is called:-
a. Apiaceae b. Oleaceae c. Rosaceae d. Scrophulariaceae
18. Which of the following plants is belonging to subfamily Rosoideae:-
a. *Rosa sp.* b. *Prunus armeniaca* c. *Pyrus malus* d. all the preceding



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Assiut University
Faculty of Science
Botany and Microbiology
Department



جامعة أسيوط
كلية العلوم
قسم النبات والميكروبيولوجي

Plant Physiology (208 BT)
Final exam.

50 Marks

Time: 2 hrs.
June 2025

Read all questions carefully. Answer only 5 questions, each one starts in a new sheet of paper.

1. Give an account on two only of the following:

- Name and description of the different solution types in plant cells
- Haem, non-heme and ferritin iron
- Light reactions, electron transport and the synthesis of assimilatory power

2. Write short notes on two only of the following:

- Photosynthetic pigments: structure and function
- Osmosis in plant cells
- Oxygen metabolism in plants

3. Write briefly on two only of the following:

- The energy output of respiring 1 molecule of glucose aerobically and anaerobically throughout all the stages of respiration
- Diffusion and imbibition
- The link between nitrogen and carbon metabolism

4. Follow the reactions of two only of the following:

- How gaseous nitrogen is fixed and metabolized into amino acids
- Phosphate metabolism in plants
- α or β oxidation of fatty acids

5. Write a short essay on two only of the following:

- Chloroplast structure and its compatibility to function
- Membranes: structure and ion transport mechanisms
- Sulfur metabolism in plant cells

6. Track briefly the reactions of two only of the following:

- Classification of lipids
- The pathway of glucose biosynthesis in photosynthesis (Calvin/carbon reduction cycle)
- Nitrate reduction, name and types of amino acids

Best wishes,


Prof. Dr. Refat Abdel-Basset

2- Polycentric fungal thallus:

3- Zoosporangial proliferation:

4- Amphigynous antheridia:

The Best Wishes (Prof. Abdel-Raouf Khallil & Dr. Ghada Abdel-Monsef)

Q.4- Give Only One Difference between THREE only of the following:- (6 Marks)

1	Peronosporaceae	Albuginaceae
2	Zygorhynchus	Phycomyces
3	Gonapodiaceae	Monoblepharidaceae
4	Cytogenes	Eu-Allomyces
5	Aplerotic resting spores	Plerotic resting spores

Q.4- Define Briefly Three only of the Following and give the name of an organism or fungal group which is related to each whenever possible:- (3 Marks)

1- Erotactin hormones:

.....

.....

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.....

.....

- 10- Spermatium empties its content into the related sporangia during the plasmogamy stage. ().
- 11- Euocarpic fungi means the thallus entirely converted into reproductive structures. ().
- 12- Fungal spores have high cytoplasmic movement and high water content. ().
- 13- Xenospores, concerned with survival, while mecnospores, concerned with dispersal. ().
- 14- All fungi are unicellular. ().

Q.3- Give the scientific term or the organism name which is related to TEN ONLY of the following (Put your answers in the next table):- (10 Marks)

- 1- The zoosporic fungal group (order) in which the hyphae are constricted at regular intervals and one of the related genus is known as the sewage fungus.
- 2- The chytrid thallus in which the zoospores are released through a lid remaining attached to one edge of the papilla.
- 3- The antheridial branch originating from the oogonial cell above the basal septum.
- 4- An obligate parasite fungus which is being investigated for use in biological control of houseflies.
- 5- The narrow ostiolate flask-shaped structure which contains the endogenous sexual spores.
- 6- The repeated and successive emergence of the secondary or principal zoospore.
- 7- Fusion between motile male gamete and immotile female one.
- 8- The aggregation of unicellular, uninucleate naked amoeboid cells which represents the vegetative structure of some slime molds.
- 9- The frog killer fungus.
- 10- A fungal species which could be used as bioagent for nematode control.
- 11- The obligate parasite fungus inhabiting the body cavity of Mosquito larvae
- 12- The fungal species which produce two forms of zoospores in their life cycle.
- 13- A symbiotic association between a fungus and an alga.

Give your answers in the following table

No	Answer	No	Answer
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5		6	
7		8	
9		10	
11		12	
13			

13. can grow only in living host tissues and capable to causing diseases.			
(a) Predators.	(b) Obligate saprobes.	(c) Obligate parasites.	(d) Symbiosis.
14. means the fungal reproductive cycle involves asexual and sexual phases.			
(a) Pleomorphic.	(b) Holomorphic.	(c) Teleomorphic.	(d) Both a&b.
15. The cells in the chain arranged in acropital succession whereas the oldest cell at the base and the youngest at the tip of chain in			
(a) <i>Aspergillus</i>	(b) <i>Mucor</i>	(c) Yeast	(d) Bacteria
16. is a type of association between the fungus and the plant roots.			
(a) Lichens	(b) Bacteriorrhiza	(c) Mycorrhiza	(d) Saprophytes
17. Spores which their primary functions concerned with dispersal called			
(a) Xenospores	(b) Memnospores	(c) Aplanospores	(d) Oospore
18. are produced by transformation of pre-existing cells of the thallus and are detached by decay of the hyphae.			
(a) Aplanospores	(b) Zygosporangia	(c) Zoospores	(d) Thallospores
19. Aggregation of uninucleate naked cells in Myxomycota (Slime molds) is			
(a) Pseudoplasmodium	(b) Plasmodium	(c) Pseudoparenchyma	(d) Mycelia
20. is acervulus-like body, in which the compact mass of conidiophores develops on a cushion-like mass of hyphae or stroma			
(a) Pycnidia	(b) Synnemata	(c) Acervulus	(d) Sporodochia
21. is the cell wall constituent of most fungi but not in Oomycetes.			
(a) Chitin	(b) Cellulose	(c) Ergosterol	(d) Lomasomes
22- Which of the following is a common asexual reproductive structure in lower fungi?			
a) Conidia.	b) Sporangiospores.	c) Ascospores.	d) Basidiospores.

Q2: Write (✓) for True sentence or (X) for False sentence (Answer 11 points only and correct the wrong word whenever possible: (11 marks)

- 1- Fungi belong to Oomycetes are characterized by the production of zoospores that have two flagella. ().
- 2- Club-root disease of Cabbage is caused by *Saprolegnia ferax*. ().
- 3- *Phytophthora* characterized by forming lemon shape sporangium and amphigynous antheridia. ().
- 4- *Bremia* is a soil inhabitant genus, causes root rot and damping off diseases of seedlings. ().
- 5- Heterogamy involves the fusion of a motile male gamete with a non-motile female gamete. ().
- 6- Anamorph refers to the asexual fungal stage. ().
- 7- Fungi characterized by presence of lomasomes and smooth endoplasmic reticulum. ().
- 8- Arthrospores are produced by the transformation or modification of pre-existing hyphal cells or conidial cells in the fungal thallus. These cells thicken their walls and condense their cytoplasm to form resistant survival structures. ().
- 9- Hyphae in many fungi develop cross walls or septa in mycelia, as in *Mastigomycotina* and *Zygomycotina*. ().



Final Exam. For the 2nd level students (Honor Microbiology and Chem.&Micro.), May, 2025.
Subject: Systematic Mycology 1 (261 B) Maximum Allowed Time: 135 Min.

Answer The Following Questions:- (Note: 5 pages should be considered)

Q1: Choose the correct answers for 20 only of the following questions: (20 marks)

1. When the mycelium of some higher fungi becomes organized into loosely or compactly woven tissues called	(a) Pseudoparenchyma	(b) Haustorium	(c) Coenocytic	(d) Mycelia
2. means fungi have no vascular system.	(a) Thallophyta	(b) Atracheophyt	(c) Achlorophyllous	(d) Crptogamae
3. Fungi which are characterized by multiflagelated zoospores.	(a) <i>Olpidium</i> .	(b) <i>Synchytrium</i> .	(c) - Myxomycota.	(e) - None of all.
4. are cells resulted from the union of two protoplasts brings the compatible two nuclei close together within the same cell.	(a) Homothallic.	(b) Karyogamy.	(c) Heterothallic.	(d) Dikaryon.
5. Elongated merosporangia containing spores in raw found in.....	(a) <i>Syncephalastrum</i> .	(b) <i>Syncephalis</i> .	(c) <i>Pilobolus</i> .	(d) Both a & b.
6. Sporangioles with 10-20 spores found in.....	(a) <i>Thamnidium</i> .	(b) <i>Helicostylum</i> .	(c) <i>Blakeslea</i> .	(d) <i>Mucor</i> .
7. means fungi lack chlorophyll and unable to manufacture their own food.	(a) Autotrophes.	(b) Pseudotrophes.	(c) Predatory.	(d) Heterotrophes.
8. In....., sporangiophores arise from unequal gametangia with unequally bifurcate hyphae, one straight small, the other curved and thicker.	(a) <i>Absidia</i> .	(b) <i>Zygorhynchus</i> .	(c) <i>Circinella</i> .	(d) <i>Mucor</i> .
9. attacks house-flies and causes the disease commonly referred to as "fly cholera".	(a) <i>Entomphthora</i> .	(b) <i>Pilobolus</i> .	(c) <i>Thamnidium</i> .	(d) <i>Blakesle</i> .
10. contains fungi that occur primarily in the gut of arthropods as commensals	(a) Zygomycetes.	(b) Oomycetes.	(c) Trichomycetes.	(d) Ascomycetes.
11. In planogametic copulation, when the planogametes are morphologically similar but different in size it called	(a) Isogamy.	(b) Anisogamy.	(c) Heterogamy.	(d) Both a & b.
12. In Gametangial copulation, migration of entire protoplast of one gametangium into the other through a pore occurs in	(a) <i>Rhizophidium</i> .	(b) <i>Mucor</i> .	(c) <i>Circinella</i> .	(d) <i>Absidia</i> .

Good luck for all

Prof. Dr. Abdel-Raouf M. Khallil

Q. 4- Match 5 only of List (I) with List (II) and select the correct answer:- (5 Marks).

I		II	
1	Poliovirus and enteroviruses	A	Lives in 70 -72°C.
2	Nitrate runoff	B	<i>Fusarium</i> species
3	Thermal pollution	C	Oxygen depletion in water
4	Industrial discharge	D	Attack the nervous system
5	<i>Thermus aquaticus</i>	E	Eutrophication
6	Algal bloom	F	Disruption of aquatic metabolism
7	Fumonisin	G	Toxic metals in aquatic environments

A Table for your answers(5 points only are required)

I	1	2	3	4	5	6	7
II							

Q.5- Discuss Briefly Three only of the followings:-

(15 Marks)

A- Red tides, highlighting their causes and impacts.

B- Cyanotoxins.

C- Fungi as indicators and contributors to water pollution.

F- Water transmitted pathogenic Viruses.

E- Fungal water pollutants and their effects.

Q.2: Using the provided table, choose the correct answer for 12 of the following:-

(12 Marks; One mark for each)

- 1- Which microorganism is commonly used in testing water for fecal contamination?
A). *Staphylococcus aureus*. B). *Pseudomonas aeruginosa*. C). *Escherichia coli*. D). *Lactobacillus*.
- 2- What is the term for pollution that comes from a specific identifiable source?
A). Point sources. B). Non-point sources. C). Surface sources. D). Groundwater sources
- 3- Which of the following is an example of a non-point source of pollution?
A). Emissions from a power plant. B) Discharge from an industrial pipe.
C). Effluents from a waste treatment plant. D). Run off from construction sites.
- 4- Using fungi for removal of various environmental pollutants is termed as:-
A). Phytoremediation. B). Phycoremediation. C). Mycoremediation. D). Both A&B.
- 5- A common effect of heavy metal pollution in aquatic systems is:
A). Increased algae growth. B). Fish kills due to toxicity.
C). Reduced sedimentation. D). Enhanced oxygenation.
- 6- Protozoa and other minute animal life are known as:-
A). Plankton. B). Phytoplankton. C). Zooplankton. D). Mycoplankton. E). None of all.
- 7- Cholera is spread through contaminated water. What is cholera caused by?
A). Bacteria. B). Viruses. C). Fungi. D). Algae. E). Protozoa.
- 8- A sewage fungus which occurs in polluted waters of high organic content like sewage and drainage water of sugar factories and breweries and may be of possible value as biological indicators of pollution is: -
A). *Achlya*. B). *Leptomitus*. C). *Aspergillus*. D). *Cladosprium*. E). None of all.
- 9- A protozoan, spread by feces contaminated material, which may cause diarrhea in humans is called:
A). Coliform. B). *E. coli*. C). Norovirus. D). *Giardia*. E). All of the above.
- 10- Which disease has been specifically linked to water pollution and was notably brought to Haiti in 2010?:-
A). Influenza. B). Typhoid fever. C). Cholera. D). Dengue fever. E). All of the above.
- 11- Gill rot disease of fish is caused by:-
A). *Saprolegnia parasitica*. B). *Aphanomyces*. C). *Exophiala*. D). *Fusarium*. E). None of all.
- 12- Which of the following compounds are required for the growth of saprophytic bacteria and fungi? A). Organic compounds. B). Nitrates. C). Phosphates. D). Mercury.
- 13- Which of the following are the primary causes of water pollution?
A). Plants. B). Animals. C). Human activities. D). None of these.
- 14- What is the permissible limit of pH preferred for potable water?
A). 3.0-8.5. B). 6.5-8.0. C). 10.0-14.0. D). 1.0-7.0.

A Table for your answers (You are required to answer only 12 points)

1		2	
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Department of Botany and Microbiology,
Faculty of Science, Assiut University.



Final Exam. For the 2nd level students (Biotechnology program) - May, 2025.
Subject: Biology of Water pollution (BT 292). Allowed Time: 120 Min.

Q1- Mark with a tick (✓) for the correct or (X) for the wrong statements of Ten Only of the followings (Correct the wrong ones):- (10 Marks)

- 1- Microorganisms coating the surface of rocks, stones and sand grains (the slippery coating on hard surfaces in rivers) are referred as community.
- 2- The rapid and excessive growth of green algae causes the red tide which discolors the water (often red or brown) and can lead to fish diseases and marine ecosystem disruption.
- 3- Freshwater ecosystem represents 80% of the earth surface.
- 4- Lentic term represents the fast flowing (rapidly moving) of water.
- 5- Bioaccumulation is the active, energy-dependent process where living organisms absorb and accumulate contaminants (such as toxins or metals) inside their cells over time.
- 6- A community consists of all the organisms living in a particular area, and the sizes of communities can vary widely.
- 7- Viruses are major agents responsible for the rapid termination of harmful algal blooms (HABs), which can otherwise lead to the death of other marine organisms.
- 8- Most of the water-borne pathogens are introduced to water through faecal contamination.
- 9- Several of waterborne viruses have extremely low infectious doses; the probability of infection from exposure to one rotavirus particle is 31%.
- 10- Fungi contribute large quantities of dissolved oxygen to aquatic ecosystems.
- 11- The proteinoid bacterial toxins which produced by Gram positive bacteria and powerful in lower doses are termed as endotoxins.
- 12- Oligotrophic lakes are characterized by nutrient-deficient, relatively low productivity and support few microorganisms.

A Table for your answers (You are required to answer only TEN points)

1	2
3	4
5	6
7	8
9	10
11	12

Final exam of Virology (BT 202)
Academic year: 2024 -2025 (2nd Semester): May 2025
Time allowed: 2 hours Total Marks: 50 marks

Answer the following questions

Question I: Mark each sentence with (✓) if it is true, or (X) if false. (10 marks)

- a) Viruses are inert outside a living host cell and can generate energy. []
- b) Genome structure of viruses consists of a nucleic acid, either DNA or RNA associated with proteins. []
- c) Lysozymes are found in bacteriophages and are used to make a small hole in the animal cell wall. []
- d) Viruses cannot be grown in standard microbiological culture like broth and agar. []
- e) Plaque assay is a technique used to estimate the shape and count of viruses. []

Question II: Identify each of the following: (10 marks)

- a) Apoptosis b) dsRNA viruses c) Helical viruses
- d) Retrovirus genome e) Virus host range

Question III: Write a brief note on each of the following: 10 marks

- a) Structure of the viral protein coat. (draw)
- b) Effect of viral infection on cell physiology.
- c) Classification of viruses.
- d) Binal or complex viruses. (draw)

Question IV: Write in detail on the following: 10 marks

- a) Nature and general characteristics of a virus.
- b) Vaccination as a process to prevent the viral infection.

Question V: 10 marks

- a) Discuss the anti-viral chemotherapy.
- b) With an illustration, discuss the viral replication stages.

Good Luck
(Prof. M. Hashem)

The second question:-

(15 marks - 1.0 mark each)

Put (✓) beside the correct answer and put (X) beside the wrong answer:-

1. Apocarpous condition refers to the presence of many united carpels ()
2. Axile placentation present in unilocular, bicarpellary ovary ()
3. Isostemonous stamens arranged in two whorls, outer whorl is opposite petals ()
4. spiral arrangement is a primitive character ()
5. Colored bract called spathe is associated with spadix ()
6. Syconium is a dichasial cyme, which is reduced into two scorpioid cymes ()
7. Berry is a fruit which is commonly dry ()
8. Siliqua fruit splits open along two sutures, from apex to base ()
9. The aggregate fruit develops from a single flower ()
10. Takhtajan proposed a phylogenetic system for plant systematic ()
11. Brassicaceae is characterized by cross-like petals ()
12. The stem of family Cyperaceae is hollow, rounded ()
13. Scrophulariaceae sometimes has 5-bilabiate petals (upper & lower lip) ()
14. *Nerium oleander* is belonging to family Apocynaceae ()
15. *Phoenix dactylifera* is belonging to family Arecaceae ()

The third question:- (20 marks)

- (i) Draw an illustration showing (4) types of racemose inflorescence (2 marks)
- (ii) Write short notes on Binomial Nomenclature (3 marks)
- (iii) Compare the following categories :- (4 marks)

- a. - Rosoideae & Pyroideae
- b. Mimosaceae & Fabaceae

Describe the floral characteristics of family Papaveraceae with floral diagram. Enumerate 2 of the important plants. (6 marks)

Give 1 botanical name of oil seeds, vegetables, pulses, cereals & medicinal plants (5 marks)

(ملحوظة : الاسم العربي للنبات ليس له درجات)

Best Wishes
Prof. Momen Zareh



The first question:-

(15 marks)

Choose the correct answer, put your answer in the table: - (1.0 mark each)

1. The arrangement of sepals & petals in bud is known as:-

- a. aestivation b. placentation c. duration d. modification

2. If the sepals become colored like petals, it is called as:

- a. sepaloid petals b. petaloid calyx c. tepals d. perianth

3. non-functional stamens are called as:

- a. staminal tube b. fertile stamen c. staminodes d. none of the preceding

4. A condition when filaments & anthers are fused is known as:-

- a. syngenesious b. synandrous c. syncarpels d. adelphous

5. When dichasial cyme ends into monochasial cyme, it is called as:-

- a. biparous b. cincinnus c. verticillaster d. uniparous

6. In raceme, the flowers arranged in succession called:-

- a. basipetal b. acropetal c. centrifugal d. separate

7. Cymose inflorescence with many lateral branches bearing flowers is:-

- a. monochasial b. dichasial c. polychasial d. verticillaster

8. Legume type of fruit is usually found in the family:-

- a. Compositae b. Apiaceae c. Gramineae d. Fabaceae

9. The edible part of banana is:-

- a. meso- & endocarp b. epi- & mesocarp c. epicarp d. pericarp

10. The seedless fruits are called:-

- a. endocarpic b. schizocarpic c. parthenocarpic d. noncarpic

11. The correct scientific name of Mango (المانجو) plant:-

- a. *Mangifera* sp. b. *Mangifera indica* c. *Mangifera indica* L. d. all the preceding

12. Four o'clock family that characterized by a petaloid tepals is:-

- a. Lamiaceae b. Apiaceae c. Fabaceae d. Nyctaginaceae

13. The plant family that characterized by papilionaceous flowers is called:-

- a. Fabaceae b. Caesalpiniaceae c. Mimosaceae d. Brassicaceae

14. Which of the following plants is belonging to family Chenopodiaceae:-

- a. *Papaver somniferum* b. *Bougainvillea glabra* c. *Spinacia oleracea* d. *Gypsophila elegans*

15. Which of the following plants is belonging to subfamily Rosoideae:-

- a. *Rosa* sp. b. *Prunus armeniaca* c. *Pyrus malus* d. all the preceding