

	Assiut University- Faculty of Science Second Semester- Final Exam 2025-2026 Botany and Microbiology Department	Program: Level: (2) Date: 20/5/2026 Time: 2 h	
Course Title: Plant Morphology and Anatomy		Code: 221 B	
Instructors: Prof. Dr. Ahmed Amro			
Important:	No. of pages 2	No. Of questions 1 (50 points)	Total Mark: 50 degrees

Choose the correct answer..... (50 marks)

1. An eccentric or terminal hilum orientation, resulting from asymmetrical appositional deposition, is a classic diagnostic feature of starch granules in: A) *Solanum tuberosum* (Potato) B) *Triticum aestivum* (Wheat) C) *Zea mays* (Maize) D) *Phaseolus vulgaris* (Bean)
2. During early histogenesis in meristematic cells, the vacuolar system manifests initially as: A) minute droplets dispersed throughout the dense cytoplasm B) a solitary, rigid crystalline inclusion C) a prominent central turgor cavity D) gaseous intercellular lacunae
3. Which of the following compounds serves as the primary, high-molecular-weight insoluble carbohydrate storage polymer within plant plastids? A) D-Glucose B) Starch C) Sucrose D) Fructose
4. During the appositional growth of starch granules, concentric lamellae are deposited sequentially around an initial organic core designated as the: A) Nucleolus B) Tonoplast C) Hilum (navel) D) Cystolith
5. The distinct 'globoid' inclusion embedded within a mature aleurone granule is chemically characterized as a phytin complex, combining proteinaceous material with rich stores of: A) Phosphorus and magnesium/calcium B) High-density sulfur compounds C) Soluble nitrogenous urea D) Structural silica polymers
6. The water-soluble vacuolar pigments responsible for the vivid red, purple, and blue coloration of floral organs and specialized storage roots are the: A) Plastidial carotenoids B) Anthocyanins C) Hydrophobic chlorophylls D) Cytoplasmic betalains
7. In which of the following botanical groups are the individual hila of starch grains structurally diffuse and highly challenging to resolve microscopically? A) *Solanum tuberosum* (Potato) B) *Zea mays* (Maize) C) *Triticum aestivum* (Wheat) D) Fabaceae cotyledons (Legume seeds)
8. The presence of alpha-amylase and amylopectin domains within starch granules is cytochemically confirmed by a dilute triiodide solution, yielding a characteristic color shift to: A) Bright Canary Yellow B) Deep Blue-Violet C) Intense Emerald Green D) Crimson Red
9. Aleurone granules represent highly specialized ergastic inclusions dedicated to the intracellular storage of: A) Structural lipids B) Soluble organic monosaccharides C) Complex proteins D) Aliphatic organic acids
10. The prominent internal calcified structure known as a cystolith, typically found within the specialized lithocysts of *Ficus elastica* leaves, is fundamentally composed of: A) Calcium carbonate B) Amorphous silicon dioxide C) Crystalline calcium oxalate D) Magnesium silicate
11. Microchemical validation of a cystolith's calcium carbonate composition involves the application of dilute hydrochloric acid (HCl), which triggers effervescence due to the liberation of: A) Pure elemental oxygen gas B) Carbon dioxide gas (CO₂) C) Diatomic hydrogen gas D) Atmospheric nitrogen gas
12. Upon cytochemical staining with Lugol's iodine, the proteinaceous matrix of an aleurone grain selectively exhibits a chromogenic reaction turning: A) Translucent black B) Brilliant royal blue C) Deep magenta-purple D) Yellowish-brown
13. The synthesis of soluble low-molecular-weight aliphatic compounds like citric, malic, and tartaric acids is driven primarily by: A) Light-harvesting photolysis reactions B) Primary mitotic division phases C) Intermediary metabolic and respiratory transformations D) Passive transpirational driving forces
14. Ergastic deposits of calcium oxalate within plant idioblasts routinely crystallize into a wide array of morphological configurations, including: A) Solitary rhombohedral prisms B) Druses (star-shaped aggregations) C) Raphides (needle-like bundles) D) All of the alternative configurations listed
15. Meristematic tissues that retain direct, uninterrupted ontogenetic continuity from the original embryonic initials are strictly classified as: A) Primary meristems B) Secondary meristems C) Permanent complex tissues D) Intercalary derivatives
16. The primary histogenic zones responsible for driving the longitudinal axis extension and generating new organ primordia are designated as: A) Lateral cambial networks B) Apical meristems C) Intercalary regions D) Extrafascicular cambia
17. The interfascicular cambium, which bridges isolated vascular bundles during secondary growth initiation in dicotyledonous stems, represents a: A) Permanent protective tissue B) Primary meristematic initialization C) Secondary meristem derived via dedifferentiation D) Specialized lateral sclerenchyma layer

- In plant histogenesis, the structural transition to permanent tissues is fundamentally marked by the cells' definitive loss of: A) Protoplasmic streaming B) Semi-permeable membrane dynamics C) Mitotic proliferative capacity D) Secondary cell wall deposition mechanics
19. The primary criterion distinguishing lysigenous secretory cavities from schizogenous ducts is based on the: A) Chemical composition of the exudate B) Cytoplasmic density of epithelial cells C) Topographical distribution within the organ D) Histological mechanism governing luminal space formation
 20. According to the classical histogen concept, the uniseriate meristematic layer responsible for generating the protective root epidermis is the: A) Ground meristem B) Procambial cylinder C) Calyptrogen D) Protoderm
 21. Parenchyma is universally characterized as the most phylogenetically and ontogenetically primitive ground tissue because it features: A) Isodiametric living cells with unspecialized primary cellulose walls B) Strongly lignified, non-living spindle elements C) Unevenly thickened pectin-rich structural frames D) Completely dead conducting pathways
 22. In hydrophytic angiosperms, the ground tissue undergoes modifications to form large, interconnected lacunae and gas-filled passages termed: A) Sclerenchymatous idioblasts B) Aerenchyma C) Chlorenchyma D) Storage parenchyma
 23. The highly specialized chlorenchymatous palisade layer, optimized for maximum light harvesting and photosynthetic efficiency, is located within: A) Root cortices B) Young woody periderm C) Dorsiventral leaf mesophyll D) Mature endosperm tissue
 24. The etymological origin of the term Collenchyma accurately reflects its mechanical role as a supportive tissue, derived from a Greek root meaning: A) Petrified stone B) Gaseous void C) Hydrated matrix D) Glue-like adhesive
 25. The structural term Scler within sclerenchyma signifies the primary mechanical property of this tissue, translating directly as: A) Highly flexible B) Active metabolic C) Viscoelastic D) Rigid, solid, or petrified
 26. Sclerenchymatous fibers are anatomically distinguished from sclereids by being: A) Elongated, narrow, spindle-shaped cells with tapered end walls B) Isodiametric, branched, and living at functional maturity C) Devoid of secondary cell wall thickenings D) Thin-walled cells specialized for metabolic storage
 27. The universally accepted mechanism detailing long-distance phloem translocation via osmotically generated hydrostatic pressure gradients is known as the: A) Dixon-Joly cohesion-tension model B) Capillary ascension theory C) Active rotational protoplasmic streaming model D) Münch pressure-flow hypothesis
 28. *Bougainvillea* stems exhibit a highly distinct form of anomalous secondary growth driven by the sequential initiation and activity of: A) Intraxylary phloem strands B) A single persistent, highly irregular cambium C) Phloem wedges within medullary rays D) Successive concentric rings of accessory vascular cambia arising from the pericycle/cortex
 29. The stem of *Leptadenia* is anatomically renowned for its anomalous secondary structure, showcasing isolated islands of phloem completely embedded inside the secondary xylem, termed: A) Included (or interxylary) phloem B) Internal (or intraxylary) phloem C) Medullary phloem wedges D) Cortical vascular strands
 30. In obligate hydrophytes bearing floating foliar laminae, the stomatal complexes are restricted topographically to the: A) Adaxial (upper) epidermal surface exclusively B) Abaxial (lower) epidermal layer only C) Both surfaces in perfectly symmetrical distribution D) Entire surface of submerged root systems
 31. Collenchyma functions as a living, extensible mechanical support tissue whose cell walls are characteristically thickened by the localized deposition of: A) Hydrophilic cellulose and pectin B) Hydrophobic structural lignin C) Suberin waterproofing polymers D) Amorphous mineralized silica
 32. Collenchyma tissue is characteristically absent or highly suppressed within the structural architecture of stems and leaves belonging to: A) Herbaceous dicotyledons B) Monocotyledonous plants C) Arborescent woody angiosperms D) Fast-growing annual shrubs
 33. The most prominent mechanical attribute of collenchyma primary cell walls, allowing them to support elongating axial organs, is their exceptional: A) Structural brittleness B) Lack of responsive turgor C) Plastic ductility and tensile extensibility D) Highly lignified rigid state
 34. Companion cells maintain an intimate symplastic connection with sieve tube elements, providing them essential metabolic support by exporting: A) Secondary structural lignin monomers B) Adenosine triphosphate (ATP) and functional proteins C) Free elemental oxygen and water D) Insoluble starch storage grains
 35. Companion cells are characteristically and phylogenetically absent from the phloem architecture of: A) Monocotyledonous families B) Advanced Dicotyledonous shrubs C) Gymnosperms (where albuminous cells fulfill their role) D) Herbaceous annual angiosperms
 36. Vessels form long, uninterrupted fluid-conducting conduits through the vertical alignment of individual cellular elements accompanied by the dissolution of their: A) Primary radial walls B) Transverse end-wall perforation plates C) Intracellular nucleoli D) Entire primary cellulose matrix
 37. Sclereids characterized by an intricate, star-shaped morphology with prominent radiating mechanical arms are classified as: A) Brachysclereids B) Astrosclereids C) Macrosclereids D) Osteosclereids

38. The protective cuticular layer covering the aerial plant epidermis is completely absent from which of the following anatomical structures? A) Xerophytic foliar laminae B) Succulent photosynthetic stems C) Absorptive roots and completely submerged hydrophyte organs D) Bud scales of temperate trees
39. Tracheids represent the exclusive vertical water-conducting structural elements found within the vascular systems of: A) Advanced Angiosperms exclusively B) Non-vascular Bryophytes C) Marine macroalgae D) Most Gymnosperms and lower vascular Pteridophytes
40. Phloem tissue functions as the primary vascular superhighway responsible for the long-distance translocation of photoassimilates from: A) Photosynthetic sources to metabolic or storage sinks B) Absorptive root tissues to sub-aerial shoot tips C) Intercalary meristems to protective epidermal outer layers D) Submerged hydrophyte roots to atmospheric pneumatophores
41. Guard cells are readily differentiated from standard unspecialized epidermal cells by their conspicuous possession of functional: A) Concentric lignified secondary walls B) Broad acellular gas cavities C) Extensively elongated mechanical fibers D) Photosynthetic chloroplasts
42. During the early ontogeny of primary protoxylem, which wall-thickening patterns are specifically adapted to facilitate rapid organ elongation without structural failure? A) Reticulate meshworks B) Densely spaced bordered pits C) Annular rings and helical spirals D) Multiseriate scalariform bars
43. The primary endodermal layer of monocotyledonous roots often develops highly pronounced secondary modifications characterized by: A) Lignified scalariform bars B) U-shaped suberin and lignin wall thickenings C) Complete structural disintegration to form aerenchyma D) Thin-walled chlorenchymatous zones
44. A vascular bundle designated as closed collateral is anatomically characterized by the: A) Complete absence of a persistent intrafascicular cambium B) Radial alternation of independent xylem and phloem strands C) Encapsulation of phloem inside a central core of xylem D) Presence of active secondary lateral meristems
45. A bicollateral vascular bundle configuration is structurally identified by the presence of: A) Alternating radial arcs of mechanical tissue B) Two distinct strands of phloem flanking the outer and inner margins of a single xylem mass C) Concentric rings of cambium within the cortex D) Xylem surrounding the phloem element entirely
46. The complex emergences known as stinging hairs (*Urtica*) provide highly effective mechanical and chemical defense against herbivorous mammals via the injection of: A) Viscous suberized latex B) Pure crystalline calcium carbonate C) Irritant toxins under high hydrostatic turgor pressure D) Lignifying enzymatic complexes
47. In fully differentiated mature plant cells, the voluminous central vacuole is bounded by a highly selective semi-permeable unit membrane termed the: A) Plasmalemma B) Middle lamella C) Primary cell wall D) Tonoplast
48. When evaluating primary vascular architecture, a plant organ is definitively categorized as a root if its primary xylem display exhibits an: A) Exarch configuration (protoxylem situated peripherally) B) Endarch configuration (protoxylem situated centrally) C) Collateral arrangement with active fascicular cambia D) Isolated bicollateral medullary configuration
49. Dicotyledonous root systems are readily distinguished anatomically from monocotyledonous roots by their primary vascular bundle arch count, which is classically: A) Highly polyarch (exceeding 8 distinct arches) B) Diarch to octarch (restricted to 2-8 arches) C) Scattered randomly across an undifferentiated ground matrix D) Always reduced to a single collateral bundle
50. The anomalous secondary growth pattern observed in *Bignonia* stems is characterized by an asymmetrical cambial activity that produces: A) Successive rings of anomalous vascular tissue B) Concentric bands of conjunctive parenchyma C) Four prominent deep wedges of secondary phloem furrowing into the secondary xylem D) Extrafascicular mechanical fibers exclusively

End of Exam

Best Wishes Prof. Dr. Ahmed Amro

	Assiut University- Faculty of Science Second Semester- Final Exam 2025-2026 Botany & Microbiology Department	Degree (Biotechnology): Third level Date: 09/6/2026 Time: 120 mints	
Course Title: Fungi		Code: BT 207	
Instructors: Prof. Dr. Ghada Abd-Elmonsef Mahmoud			
Important:	No. of pages 7	No. Of questions 4	Total Mark:50 degree

Answer the following question

Q1): Put true (√) or false (×) in front of 20 statement only

(20-mark, one mark for each)

1	Tertiary mycelia originate from the primary mycelia and characterized by the Clamp connections.	
2	Hemiascomycetes characterized with naked asci (no ascocarps).	
3	Candidiasis represents a group of diseases caused by <i>Neurospora crassa</i> .	
4	Mushroom are belonging to class zygomycetes.	
5	<i>Phytophthora infestans</i> causes late blight of potato.	
6	Basidiocarp originate from tertiary mycelia	
7	<i>Claviceps</i> parasitizing on graminaceous plants causing ergot disease	
8	<i>Cordyceps</i> species are endoparasitoids, mainly on insects and other arthropods	
9	Basidiomycetes are characterized by producing five basidiospores on basidium.	
10	Dayal (1975) mentioned seven characters that are used in fungal taxonomy.	

11	In zygomycetes the asexual reproduction takes place by non-motile sporangiospores called zoospores	
12	Zygomycetes contains fungi that occur primarily in the gut of arthropods	
13	In <i>Absidia</i> sporangiophores are straight in groups of 2-5.	
14	Suspensor furnished with dichotomously branched appendages which are brownish black found in <i>Rhizopus</i>	
15	Spores often spinulose (spined) and named sporangiola in <i>Cunninghamella</i>	
16	Entomophthora <i>muscae</i> attacks house-flies causing fly cholera which is quite common during summer.	
17	In chytridiomycetes zoospores the flagellum is posterior whiplash type	
18	Gametothallus of <i>Allomyces</i> formed by meiospores.	
19	Dimorphism and zoosporangial proliferation are characteristic of <i>Cladosporium</i> species.	
20	Thamnidaceae has sporangia of two sorts, primary and secondary.	
21	Gemmae of <i>Saprolegnia</i> are globose and arranged in chains.	
22	<i>Brevilegnia</i> has cylindrical zoosporangia, and the zoospores release by sporangia penetrates the zoosporangia wall	
23	<i>Thraustotheca</i> has clavate zoosporangia, and the zoospores release by sporangia wall disintegrates.	

Q2): Select the correct term for each statement

(10 marks, one mark for each)

(Cleistothecium) - (Eucarpic fungi) - (Pleomorphic) - (Xenospores) -
(Aplanospores) - (Apothecium) - (Acropetal succession) - (Thallospores) -
(Synnema) - (Pycnidia)

1	Asci organized in a disc, or club-shaped ascocarp	
2	only a part of the thallus develops into the reproductive organs	
3	Spores were concerned with dispersal.	
4	Completely enclosed ascocarp with scattered asci	
5	are produced by transformation of pre-existing cells of the thallus and are detached by decay of the hyphae.	
6	is a large, erect reproductive structure borne by some fungi bearing compact conidiophores, which fuse together to form a strand resembling a stalk	
7	Non-motile sporangiospores	
8	The cells in the chain arranged whereas the oldest cell at the base and the youngest at the tip of chain	
9	Globose or flask-shaped with a narrow ostiole.	
10	the fungal reproductive cycle involves asexual and sexual phases	

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	Assiut University- Faculty of Science Second Semester- Final Exam 2025-2026 Botany and Microbiology Department	Program: Level: (2) Date: 20/5/2026 Time: 2 h	
Course Title: Plant Morphology and Anatomy		Code: 221 B	
Instructors: Prof. Dr. Ahmed Amro			
Important:	No. of pages 2	No. Of questions 1 (50 points)	Total Mark: 50 degrees

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Q3): Discusses two only of the following and put your answer in table

(10 marks)

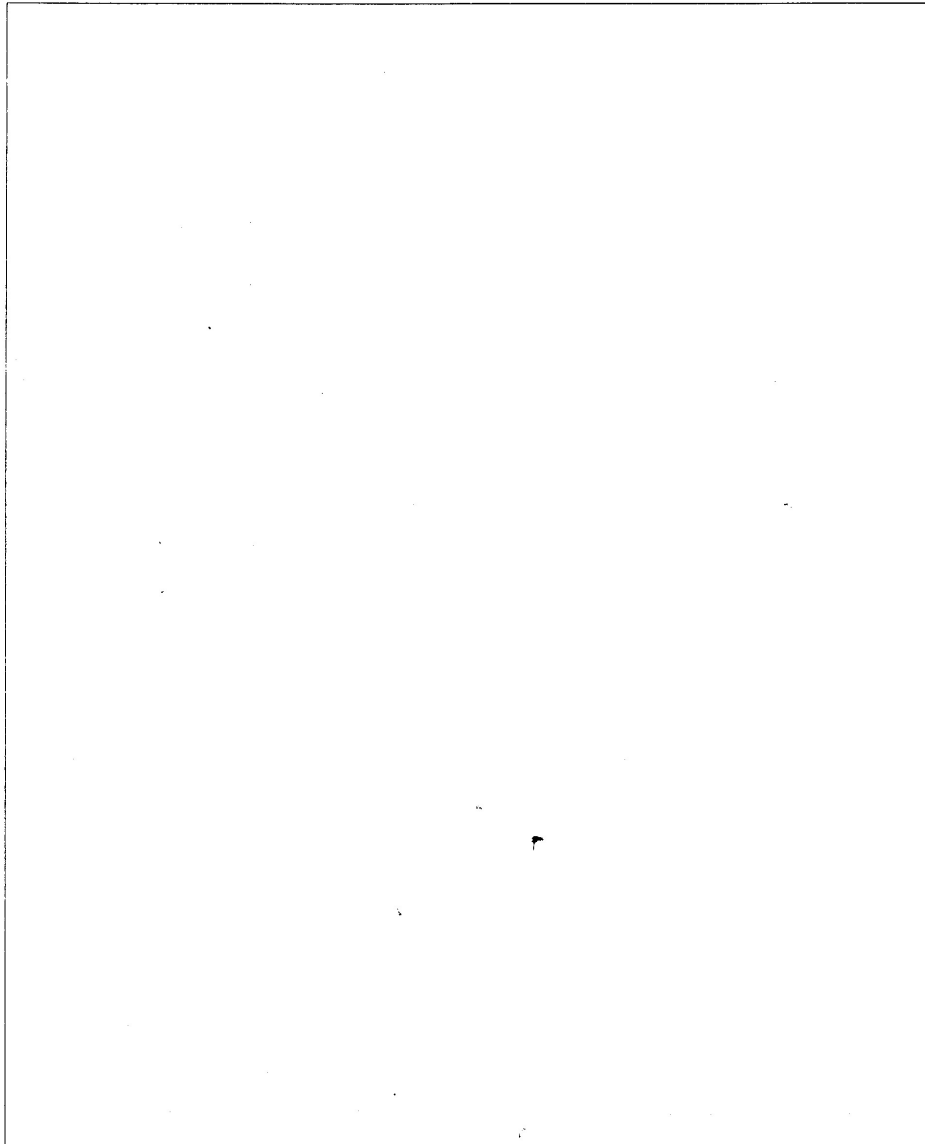
(10 marks)

1. Fission and budding in yeast.
2. Types of planogametic copulation.
3. Mode of life (Nutrition) in fungi.
4. General characteristics of fungi.

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Q4): Write short notes on two only from the following (10 marks)

1. *Synchytrium endobioticum* life cycle
2. Sexual reproduction in *Albugo* (*Cystopus*)
3. Sexual reproduction in *Rhizopus* sp.
4. *Plasmodiophora brassicae* life cycle



	Assiut University- Faculty of Science Second Semester- Final Exam 2025-2026 Botany & Microbiology Department	Degree: Second level Date: 24/5/2026 Time: 120 mints	
Course Title: Systemic mycology 1		Code: 262 B	
Instructors: Prof. Dr. El Hagag Ahmed Hassan, Ass. Prof. Ghada Abd-Elmonsef Mahmoud			
Important:	No. of pages 4	No. Of questions 4	Total Mark:50 degree

Answer the following question

Q1: Choose the correct answer for the following questions: (2:5 marks)

1. proposed a five-kingdom system and placed fungi in a separate kingdoms			
(a) Carl Linnaeus	(b) Copeland	(c) Whittaker	(d) Haeckel
2. can grow only in living host tissues and cause diseases.			
(a) Obligate saprobes	(b) Mycorrhizae	(c) Obligate parasites	(d) Symbiosis
3. Fungi preserve their food inform of			
(a) glycogen	(b) lipids	(c) starch	(d) a & b
4. type of association in which the fungus enters in partnership with plant roots			
(a) Homothallic	(b) Pleomorphic	(c) Lichens	(d) Mycorrhizae
5. Fungi are eukaryotic microorganisms characterized as			
(a) Thallophyta	(b) Crptogamae	(c) Atracheophyta	(d) All a, b, c
6. Aggregation of uninucleate naked cells called			
(a) Pseudoplasmodium	(b) Plasmodium	(c) Rhizomorph	(d) Mycelium
7. In.....conidiophores produced singly or united in the base in saucer-shaped structure.			
(a) Acervuli	(b) Sporodochia	(c) Pycnidia	(d) Synnema
8. In..... the cells in the chain arranged in acropital succession			
(a) Absidia	(b) Yeast	(c) Aspergillus	(d) Mucor
9. is acervulus-like body, in which the compact mass of conidiophores develop on a cushion-like mass of hyphae.			
(a) Pycnidia	(b) Sporodochia	(c) Acervuli	(d) Synnema
10.are produced by transformation of pre-existing cells of the thallus and are detached by decay of the hyphae			
(a) Arthrospores	(b) Thallospores	(c) Chlamydospores	(d) All a, b, c
11. When the thallus entirely converted into reproductive structures it called			
(a) Holocarpic fungi	(b) Pleomorphic	(c) Eucarpic fungi	(d) Teleomorph

12. In Gametangial copulation, migration of entire protoplast of one gametangium into the other through a pore occurs in			
(a) <i>Rhizopodium</i>	(b) <i>Mucor</i>	(c) <i>Circinella</i>	(d) <i>Absidia</i>
13. its spherical sexual fruiting bodies with scattered asci.			
(a) Pycnidia	(b) Synnemata	(c) Acervulus	(d) Cleistothecium
14. means the fungal reproductive cycle involves asexual and sexual phases.			
(a) Pleomorphic	(b) Teleomorph	(c) Anamorph	(d) Zygomorph
15. According to Myxomycetes are not fungi			
(a) Dayal (1975)	(b) Bessey (1950)	(c) Gwynne and Barners (1937)	(d) Ainsworth (1973)
16. is a type of sexual spores produces inside asci, endogynous.			
(a) Oospores	(b) Zygosporoes	(c) Mycorrhiza	(d) Ascospores
17. When the two fusing gametes are morphologically similar but different in size it called			
(a) Heterogamy	(b) Isogamy	(c) Dikaryon	(d) Anisogamy
18. In the entire contents of the two gametangia fuse and become one.			
(a) Gametangial contact	(b) Spermatization	(c) Gametangial copulation	(d) Somatogamy
19. If a single mycelium is capable of reproducing sexually it called			
(a) Heterothallic	(b) Homothallic	(c) Fusion	(d) Plasmogamy
20. contains fungi that occur primarily in the gut of arthropods			
(a) Trichomycetes	(b) Zygomycetes	(c) Ascomycetes	(d) Basidiomycetes
21. In sporangiophores are straight in groups of 2-5.			
(a) <i>Absidia</i>	(b) <i>Mucor</i>	(c) <i>Circinella</i>	(d) <i>Rhizopus</i>
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(a) <i>Pilobolus</i>	(b) <i>Thamnidium</i>	(c) <i>Circinella</i>	(d) <i>Rhizopus</i>
25. attacks house-flies causing fly cholera which is quite common during summer.			
(a) <i>Syncephalastrum</i>	(b) <i>Pilobolus</i>	(c) <i>Zygorhynchus</i>	(d) <i>Entomophthora</i>

With my Best Wishes
Ass. Prof. Ghada Abd-Elmonsef Mahmoud

Q2: Write on FOUR ONLY of the following (with labeled diagram if possible): (10 Marks)

- 1- The life cycle of the organism responsible for club root disease.
- 2- The asexual stage as a taxonomic criterion for the members of saprolegniaceae.
- 3- The different genera causing downy mildew diseases.
- 4- Classification of order peronosporales.
- 5- Asexual life cycle of the white rust causing fungus.

Q3: Compare between TWO ONLY of the following (with labeled diagram): (5 Marks)

- 1- *Pythium* and *Aphanomyces*.
- 2- Eucarpic and holocarpic thallus.
- 3- Zoospore flagellation in Oomycetes and Chytridiomycetes.

Q4: Choose the correct answer: - (10 Marks)

1. Which statement about Oomycota is FALSE?
A. Hyphae are aseptate B. Haploid dominant life cycle
C. Cell wall contains cellulose D. Produce oospores sexually
2. Which structure is produced after meiosis in the cortex of infected roots?
A. Diploid plasmodium B. Haploid plasmodium forming resting spores
C. Zoosporangium D. Conidia
3. Which of the following is INCORRECT?
A. *Pythium* cause damping-off B. *Phytophthora* cause late blight
C. *Albugo* cause powdery mildew D. *Bremia* cause lettuce downy mildew
4. Which nuclear condition may occur in the plasmodium of Myxomycota?
A. Only dikaryotic ($n+n$) B. Only diploid ($2n$)
C. Triploid ($3n$) D. Haploid ($1n$) or diploid ($2n$)

5. Which of the following is characterized by the presence of motile zoospores with a single posterior flagellum
 - A. *Sclerospora*
 - B. *Allomyces*
 - C. *Albugo*
 - D. *Saprolegnia*
6. Cellulin structures located at constricted regions of hyphae are characteristic of which fungal order?
 - A. Saprolegniales
 - B. Peronosporales
 - C. Leptomitales
 - D. Chytridiales
7. A major characteristic of Myxomycota is
 - A. Presence of septate hyphae
 - B. Definite cell walls in vegetative stage
 - C. Vegetative body is a plasmodium
 - D. Reproduction only by conidia
8. Which of the following is an obligate parasite?
 - A. *Achlya* sp.
 - B. *Saprolegnia* sp.
 - C. *Pythium* sp.
 - D. *Synchytrium* sp.
9. Powdery scab of potatoes is caused by:
 - A. *Plasmodiophora brassicae*
 - B. *Alternaria solani*
 - C. *Phytophthora infestans*
 - D. *Spongospora subterranea*
10. The reason Myxomycota show plant like characters during reproduction is due to:
 - A. Cellulose cell walls in plasmodium
 - B. Presence of hyphae
 - C. Formation of walled reproductive structures
 - D. Absence of nuclei

With my best wishes

Prof. Dr. Hagag A. Hassan

	Assiut University- Faculty of Science Second Semester- Final Exam 2025-2026 Botany & Microbiology Department	Programs: Biotechnology. Level: (2) Date: 24/5/2026 Time: 2 h Code: (204 BT)	
Course Title: Phycology		Instructor: Dr. Ahmed Issa	
Important:	No. of pages 5	No. Of questions 5	Total Mark: 50 Marks

Q 1: Choose the correct answer:

Q1		10
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- (1) Free floating aquatic algae are known as
 (a) Epiphytic algae (b) Epilithic algae (c) Phytoplankton (d) Symbiotic algae
- (2) Which are the most primitive group of algae.
 (a) Blue green algae (b) Green algae (c) Desmids (d) Diatoms
- (3) Water net is the common name for
 (a) *Ulva* (b) *Sargassum* (c) *Chara* (d) *Hydrodictyon*
- (4) Phycoerythrin is a colored pigment that can be found in.....
 (a) Blue-Cyanophyta (b) Red-Rhodophyta (c) Blue-Rhodophyta (d) Red-Chlorophyta
- (5) Asexual reproduction by the formation of daughter colony or autocolony is found in.....
 (a) *Hydrodictyon* (b) *Volvox* (c) *Pandorina* (d) All of the above
- (6).....algae are those that can produce both male and female gametes from the same cell.
 (a) Monoecious (b) Diecious (c) Both (a) and (b) (d) None of the above
- (7) Which pair of the following are wrongly matched?
 (a) Phaeophyta – Fucoidan (b) *Euglena* – Mesokaryote
 (c) Cyanobacteria – Glycogen (d) None of the above
- (8) Which is a globule?
 (a) An oogonium of *Chara* (b) Zygote of *Cladophora*
 (c) An antheridium of *Chara* (d) A daughter colony of *Volvox*
- (9) Reserve food material as dianosterols can be found in
 (a) Phaeophyta (b) pyrrhophyta (c) Green algae (d) Xanthophyta
- (10) Chlorophyll d is found in.....
 (a) Bacillariophyta (b) Phaeophyta (c) Xanthophyta (d) Rhodophyta

QII: Differentiate between each two of the following.

Q2		10
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1. Asexual spores of *Vaucheria* and *Chlamydomonas*

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.....
.....

2. Isokontae and Heterokontae Flagella, with example.

.....
.....
.....

3. Gametes and type of sexual reproduction in *Cosmarium* and *Spirogyra*.

.....
.....
.....

4. Endospore and Exospore formation in cyanobacteria.

.....
.....
.....

QIII: Give the scientific reason(s) of the following:

Q3		10
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1. The coenobium of *Volvox* is more advanced than *Pandorina*.

.....

.....

.....

2. Vegetative reproduction in diatoms.

.....

.....

.....

3. *Nostoc* has a blue green color, while *Sargassum* has a brown color.

.....

.....

.....

4. Movements in *Oscillatoria*.

.....

.....

.....

QIV: Complete the following sentences:

Q4		10
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1. Algae growing on Animals are known as.....
2. Chlorophyll a is found in.....
3.is a microalga used as food.
4. Asexual reproduction in *Dermocarpa* is by formation of.....
5. Compound Zoospores are found in.....
6. Algae consisting of definite number of cells are known as.....
7.is an immotile unicellular green microalga.
8. *Zygnema* has.....shaped chloroplast.
9. Both *Chlamydomonas*, *Pandorina*, and *Volvox* haveshaped chloroplast.
10. Unicellular algae which have two semi-cells are known as.

Q V: Write short notes on the following

Q5		10
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1. Red Tide

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.....
.....

2. Economic Important of Diatoms

.....
.....
.....

3.Harmful aspects of cyanobacteria

.....
.....
.....

4.Animal Characters of *Euglena*

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.....
.....

With all best wishes

prof.Dr. Ahmed. Issa



Second Semester – Final Exam –2025-2026
Subject: English Language 1
Time: 2 Hours
Total Mark: 50



(30x1=30 Marks)

I. Choose the correct answer.

1. After driving for three hours, the tourists stopped at the Yosemite National Park where they hanged out for a while and took some photos. This sentence/ clause is A. complex B. compound
2. Because I can't wait for the bus for more than half an hour This is a/an sentence/ clause. A. simple B. dependent C. complex D. compound-complex
3. They did not cheat on the test, for it was the wrong thing to do. This is a/an sentence/ clause. A. simple B. compound C. compound-complex D. dependent
4. As soon as I heard the news, I called Nathan, and we made plans to celebrate. This is a/an sentence/ clause. A. simple B. compound C. complex D. compound-complex
5. I am happy to take your donation; any amount will be greatly appreciated. This is a/an sentence/ clause. A. simple B. compound C. complex D. compound-complex
6. Fortunately, the explosion "diverted" the asteroid from a course that would have sent it hurdling into our planet. To "divert" is to _____. A. change the direction of B. look for really high waves
7. Those scientists want to hear what our professor thinks about their theory because he is the "foremost" expert in their field. "Foremost" means A. The first or main one B. craziest
8. Speaking rudely to the judges was "rash" behavior. You really hurt your chances of winning. In this context, what does "rash" mean? A. an itchy skin condition B. with little thought or consideration
9. The "lead" inside the common pencil is actually not lead at all. Choose the sentence that best supports or develops this topic sentence.
A. Pencils were invented in 1603 by William Ledbelly. B. The substance used in pencils today is graphite.
10. Anyone who thinks this explanation sounds radical needs to "brush up on" economics. The meaning of the underlined idiom is A. forget about B. clean C. major in D. review
11. The twins were both feeling "under the weather" today, so they stayed home from school. The meaning of the underlined idiom is A. sick B. cold C. sad D. lazy
12. Most fire investigations are pretty "cut and dried", but this one has left more questions than answers. The meaning of the underlined idiom is A. full of blood scenes B. predictable C. scary
13. Be careful if you take the car because refueling points along that route are "few and far between". The meaning of the underlined idiom is A. not allowed B. rare C. very common
14. Robert felt very "ill at ease" waiting for the results of his final exams. The meaning of the underlined idiom is A. frightened B. sick C. worried D. easy-going
15. Choose the parallel sentence:
A. Millions recognized Cousteau, who was thin, bespectacled, and he wore a red cap.
B. Millions recognized Cousteau, who was thin, bespectacled, and red-capped.
16. Choose the parallel sentence:
A. The dean's policies and beliefs influenced both students and faculty members.
B. The dean's policies and what he believed influenced both students and faculty members.
17. He is one of the men who the work. A. doing B. does C. do D. is doing
18. From your words, I can that you think he is guilty. A. affect B. effect C. infer
19. Gas prices continue to A. rise B. raise C. risen D. None of the above
20. Elena, together with her brothers, been evicted. A. has B. have C. is

21. There are quite a few literary incorporated in the poem. A. delusions B. allusions
 22. Michael the picture for his mother. A. hang B. hanged C. hung
 23. responsible for the advertising of the event? A. Who B. Who's C. Whose
 24. The weather greatly the outcome of the race. A. affected B. effected C. effects
 25. None of the neighbors offered support. A. his or her B. their C. its
 26. Although we can never be sure, some of us him. A. trusts B. trust C. trusting
 27. Economics among the most popular majors at that university. A. is B. are
 28. I am going to down for an hour. A. lay B. laid C. lain D. lie
 29. Every student and teacher been busy preparing for the big event. A. has B. have
 30. Either of the mothers will be willing to tell you story. A. their B. her

II. Read the following passage, and then choose A, B, C or D:

(10x2=20 Marks)

In many cities around the world, empty lots, rooftops, and even abandoned railway lines are being transformed into green spaces. This movement, known as urban gardening, has gained popularity over the past decade. Citizens are planting vegetables, herbs, and flowers in places that were once concrete eyesores. Beyond beautification, urban gardening offers several practical benefits. First, it improves food security. In neighbourhoods known as "food deserts" – areas with limited access to fresh produce – community gardens provide a local source of healthy fruits and vegetables. Residents can grow their own food, reducing reliance on expensive supermarkets located far away. Second, urban gardens help the environment. Plants absorb carbon dioxide and release oxygen, while green roofs reduce the amount of stormwater runoff that can overwhelm city drainage systems. Socially, community gardens bring people together. Neighbours who never spoke before may find themselves sharing gardening tools or advice on growing tomatoes. Studies have shown that areas with active community gardens often experience lower crime rates and stronger social bonds. Additionally, gardening itself is a moderate physical activity that can reduce stress and improve mental wellbeing. However, urban gardening is not without challenges. Soil in cities may be contaminated with heavy metals from previous industrial use. Gardeners often need to build raised beds with clean soil. Access to water can also be a problem, especially during hot summers when municipalities restrict usage. Furthermore, land in dense cities is expensive, and temporary gardening permits may be revoked if a lot is sold for development. Despite these obstacles, the urban gardening movement continues to grow. Many local governments now offer grants, educational workshops, and tax breaks to encourage residents to start gardens. As one community organiser put it, "A seed planted in the city is a seed of change – for our health, our neighbourhoods, and our planet."

1. What is the main purpose of the passage?

- A) To compare rural and urban farming methods
 B) To explain the benefits of urban gardening

2. According to the passage, what is a "food desert"?

- A) A place with no restaurants
 B) An area with little access to fresh food

3. How do urban gardens help the environment?

- A) By reducing the number of cars on the road
 B) By absorbing carbon dioxide

4. Which social benefit of community gardens is mentioned?

- A) Higher property taxes
 B) Lower crime rates and stronger social bonds

5. What challenge related to city soil is described?

- A) It is too sandy for plants
 B) It may contain heavy metals from past industry

6. Why might a city government support urban gardening?

- A) To make it harder for citizens to grow food
 B) To offer grants and tax breaks as incentives

7. What does the author say about water access for urban gardens?

- A) It is never a problem in cities
 B) It can be difficult during hot summers

8. Which of the following is NOT listed as a benefit of urban gardening?

- A) Improving mental wellbeing
 B) Increasing the price of supermarket vegetables

9. How does the author view the future of urban gardening?

- A) Hopeful and growing despite challenges
 B) Pessimistic – it will disappear soon

10. Based on the passage, what should a city gardener do if the local soil is contaminated?

- A) Abandon the garden immediately
 B) Use raised beds with clean soil

Good Luck: Dr. Marwa M. Abdelmoteleb

	Assiut University – Faculty of Science Second Semester – Final Exam 2025-2026 Botany & Microbiology Department	Programs: Microbiology, Chemistry & Microbiology, Botany, Chemistry & Botany Level: (2) Date: 1/6/2026 Time: 2 h	
Course Title: Molecular Biology		Code: 212B	
Instructor: Dr. Mohamed Goma			
Important:	No. of pages 2	No. Of questions 5	Total Mark: 50 Marks

Question I: Answer 4 ONLY of the following: (10 Marks)

- (a) Two bacterial species are found in different environments—The first with A = 10% and the other with G = 10%.

- (1) What would be the percentage of the other bases in each bacterium?
- (2) Which bacterium can live in a hot environment and why?

- (b) The opposite Fig. (1) shows some information about a DNA molecule:

- (1) How many nucleotides are there in the DNA molecule?
- (2) How many pyrimidine bases are present in this molecule?
- (3) How many hydrogen bonds are present?
- (4) How many helical turns does this molecule have?
- (5) How many phosphate groups are in this molecule?

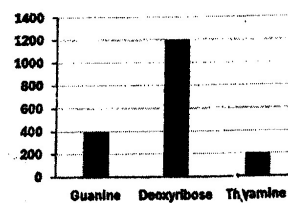


Fig. (1)

- (c) In the following DNA sequence:

5'- TTGACA....TATAAT AGGAGG ATG GCT TAC GAA TGA - 3'

Identify which region represents: (a) Ribosomal binding site, (b) Promoter, (c) Pribnow box, and (d) Determine the number of amino acids in the polypeptide chain after translation.

- (d) Given the following DNA sequencing results in Fig. (2):

- (1) What is the correct sequence of the template DNA?
- (2) What is the specific technique used for sequencing?
- (3) What is the method used to separate the DNA fragments into distinct bands?

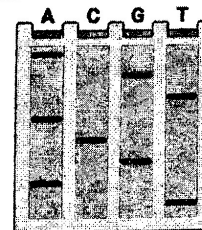


Fig. (2)

- (e) Given the following primer sequence designed for PCR amplification:

5'-AGTCCGATGCTAGCTAAGTC-3'

- (1) Calculate the melting temperature (Tm) for this primer.
- (2) Calculate the annealing temperature (Ta) for this primer.
- (3) How many primers are used in PCR and why?

Question II: Mention the function of the following: (ANSWER 10 ONLY):

(10 Marks)

- | | |
|--|------------------------|
| (1) DNA gyrase. | (7) Photolyase. |
| (2) Aminoacyl tRNA synthetase. | (8) Rho protein. |
| (3) Dideoxynucleotides. | (9) RNA primase. |
| (4) <i>Agrobacterium</i> in gene cloning. | (10) qPCR. |
| (5) Histones. | (11) Ribosomal A site. |
| (6) Minichromosome maintenance complex (MCM 2-7) | (12) Excinuclease. |

Question III: Write ONE difference between each two of the following (ANSWER 10 ONLY):
(15 Marks)

- | | |
|---|---|
| (1) Pribnow box & TATA box. | (7) Monocistronic & Polycistronic mRNA. |
| (2) Topoisomerase I & II. | (8) Leading & Lagging DNA strands. |
| (3) Dna A & Dna B. | (9) Nonsense & Missense mutation. |
| (4) RNA polymerase & Reverse transcriptase. | (10) Southern & Northern blotting. |
| (5) T arm & D arm of tRNA | (11) Plasmid and Cosmid. |
| (6) Conventional PCR & Multiplex PCR. | (12) Inducible & repressible genes. |

Page 2 of 2

Question IV: Write the scientific reason(s) for 5 ONLY of the following:
(7.5 Marks)

- (1) Sliding clamp is important during DNA replication.
- (2) DNA replication is described as semiconservative and semi-discontinuous.
- (3) Gene cloning depends on restriction enzymes.
- (4) DNA has thymine instead of uracil in RNA.
- (5) UV radiation causes mutations in living cells.
- (6) *Taq* polymerase is used in PCR.

Question V: Write short notes on 3 ONLY of the following:
(7.5 Marks)

- (1) Replisome.
- (2) mRNA processing in eukaryotic cells.
- (3) Development of viral vaccines by gene cloning.
- (4) Hershey and Chase experiment.

With all best wishes..... Dr. M. GOMAA

	Assiut University- Faculty of Science First Semester- Final Exam 2025-2026 Botany and Microbiology Department	Program: Biotechnology Level: (2) Date: 1/6/2026 Time: 2 h	
Course Title: molecular biology course		Code: (B212)	
Instructors: Prof. Dr. Sanaa Mohamed Fahmy			
Important:	No. of pages 6	No. Of questions 5	Total Mark:50 degree

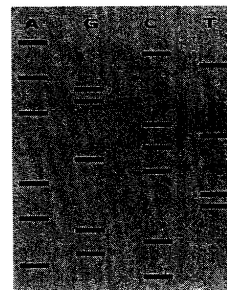
Q1) Answer the following questions (5 Marks)

(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?

.....
.....



Q2) Choose the correct answer: (30 Marks)

1. The DNA replication is continuous in one strand and discontinuous in the other.

- a. True b. False

2. there is one amino acid for one genetic code

- a. True b. False

3. Restriction enzymes make

- a. double stranded breaks b. break in a single strand
c. make primer d. ligation of broken strands

4. In the case of a circular DNA Synthesis how many replication forks are observed?

- a. 1 b. 2 c. 3 d. 4

5. Splicing joins together

- a) two introns b) two exons
c) an intron and an exon. d) two RNA molecules

6. The lac-z gene marker codes for

- a) galactosidase, which splits x-gal
- b) ampicillin resistance
- c) galactosidase, which makes x-gal resistant to splitting
- d) white colonies

7. Separation of the two strands of DNA is catalyzed by

- a. Helicase
- b. Ligase
- c. Gyrase
- d. restriction enzyme

8. Polyadenylation takes place in

- a. Primary transcript at downstream.
- b. Mature mRNA at upstream.
- c. Gene beside promoter.
- d. The termination of replication.

9. Sigma factor is

- a) a subunit of mRNA
- b) a subunit of RNA polymerase
- c) a subunit of DNA
- d) a protein needed for transcription to proceed

10. With respect to DNA replication which of the following enzyme is not correctly paired with its function?

- a. Helicase - separate the double stranded DNA
- b. DNA polymerase III elongation of DNA strand
- c. Primase- initiation of new strand synthesis
- d. RNA polymerase II -elongation of DNA single strand

11. Which of the following would produce blue colonies?

- a) bacterial cells without plasmids
- b) bacterial cells containing plasmids without inserts
- c) bacterial cells containing plasmids with the gene of interest
- d) bacterial cells containing plasmids with inserts, but not the gene of interest

12. For DNA amplification to occur, which of the following are needed?

- a) loose ribonucleotides
- b) RNA primers
- c) thermostable DNA polymerase
- d) all of the above

13. RNA base all the following EXCEPT:

- a) Ribose sugar b) Single strand c) Contains uracil d) Deoxyribose sugar

14. The basic subunit of chromatin is ..

- a) DNA b) nucleosome c) histone proteins d) HO gene

15. The first step in cloning a gene is to

- a) insert a plasmid into a bacterium b) treat plasmids with restriction enzymes
c) plate cells on agar b) isolate the DNA from the organism that contains the desired gene

16. The purpose of the Southern Blot test is to

- a) look for a specific nucleotide sequence in the DNA being tested
b) to determine how closely two organisms are related
c) to identify the size of the fragment that contains the sequence
d) a and c

17. Plasmids are put into bacterial cells by

- a) restriction enzymes b) DNA ligase
c) binding of cohesive sticky ends d) transformation

18. Which of the following sequences is complementary to the reading strand (5'-CGCATGTAGCGA-3')

- a) 5'-AGCGATGTACGC-3'
b) 3'-AGCGATGTACGC-5'
c) 5'-GCGTACATCGCT-3
d) 3'-GCCGTACATCGCT-5'

19. Which of the following is not an essential feature for being a perfect vector?

- a. Selectable marker b. Origin of replication c. Virulent gene d. Restriction site

20. During protein synthesis, what is the site of uncharged tRNA on the ribosome?

- a) A b) E c) P d) A, E and P

21. At the beginning of each cycle, the temperature of PCR reaction is raised to

- a) elongate the primer b) renature the double DNA strands
c) polymerize the DNA d) denature the double DNA strands

22. 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

23. Cosmids are hybrid vectors combining features of:

- A) Plasmids and bacteriophages B) Mitochondria and ribosomes
C) Viruses and proteins D) Introns and exons

24. Which of the following is a component of the nucleic acid backbone?

- a. Nitrogenous base b. Pentose-phosphate c. Amino acid d. Hydrogen bond

25. 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

26. Okazaki fragments occur on the..... and are bonded together by.....

- a) leading strand, polymerase b) mRNA, anticodons
c) lagging strand, ligase d) tRNA, polymerase

27. What is a nucleosome?

- a) A nucleosome is a unit made up of nucleoplasm and ribosomal subunits.
b) A nucleosome is the portion of DNA preparing for transcription.
c) A nucleosome is a cluster of introns wrapped up as a unit.
d) A nucleosome is a region which DNA is wrapped tightly around a cluster of histone proteins.

28. What is the role of messenger RNA?

- a) To bring the DNA message to the mitochondrion
b) To bring the tRNA message to the nucleus
c) To bring the DNA message to the ribosome
d) To take amino acid to the ribosome

29. Which of the following is NOT a type of RNA?

- a) Messenger b) Transcription c) Transfer d) Ribosomal

30. Short sequence in the promoter where transcription factors bind

- a) TATA box b) Promoter
c) RNA polymerase d) Initiation Sequence

Q3: Write the scientific term for the following: (5 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) 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. (.....)

Q4: Give the differences between: (5 Marks)

a. Leading strand & lagging strand?

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.....
.....
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B. Primary and secondary structure of DNA?

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[illegible][illegible]

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or printed text on the paper.

...Prof. Dr. Sanaa Mohamed Fahmy



Read all questions carefully. Answer the following questions, each one starts on a new sheet of paper.

1. Give an account on two only of the following (10 marks):

- a. Name and description of the different solution types in plant cells
- b. Osmosis in plant cells
- c. Enzyme commission number (EC number)

2. Write short notes on two only the following (10 marks):

- a. Photosynthetic pigments: structure and function
- b. Diffusion and imbibition
- c. Mode of enzyme action

3. Track the reactions of two only of the following (10 marks):

- a. Calvin cycle
- b. Krebs cycle
- c. Enzyme Kinetics

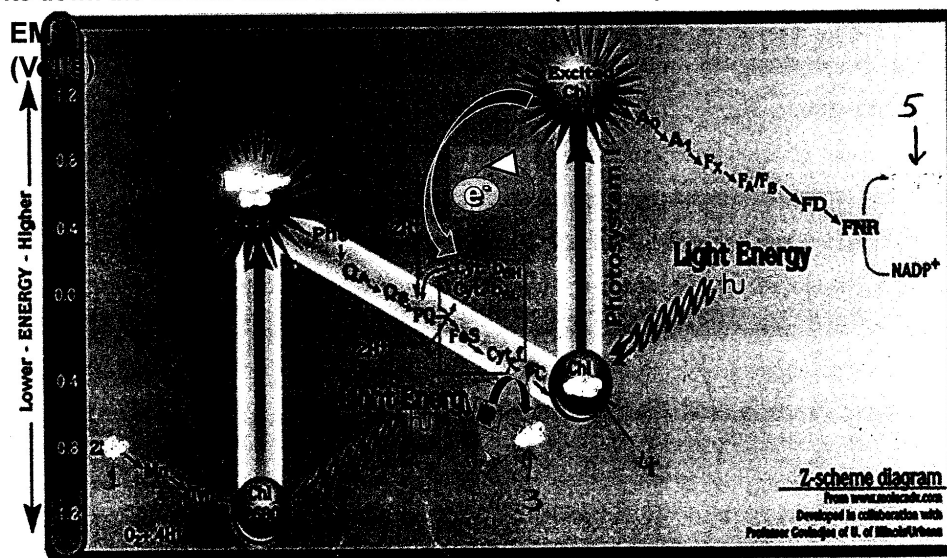
4. Underline the correct answer (5 marks):

- a. Metabolic processes that require expenditure of energy are called (a) active – (b) passive – (c) physical – (d) physiological).
- b. Plants absorb water (a) much higher (b) much lower (c) just enough (d) any of them, than they consume.
- c. Water takes up serves several benefits in plants; these are (a) absorbing mineral elements (b) temperature conditioning (c) dissolves solutes (d) all of them
- d. (a) Diffusion of water vapor from plant leaves to the atmosphere through transpiration (b) water pressure deficit between cells (c) osmotic suction force between cells and soil particles (d) all of them, drive plant water uptake
- e. Glucose molecules are (a) formed during photosynthesis – (b) oxidized during respiration – (c) respired to produce ATP – (d) all of them.

Fill in the spaces in column A with the relevant terms in column B (10 marks, one point free):

	A	B
1	 is composed of four pyrrole rings.	Thylakoid membranes
2	Most of the assimilatory power is consumed during the of Calvin cycle.	Feedback inhibition
3	PSI, PSII, cyt.b6f and ATP synthase are photosynthetic components located in the	ATP synthase
4	The breakdown of a glucose molecule into two acetyl CoA molecules is known as	A Porphyrin ring
5	The enzyme that synthesizes ATP is called	glycolysis
6	Photosynthesis cannot proceed without	Enzyme-substrate complex
7	 is determined by the last step in a reaction.	"ase"
8	 is a reversible reaction.	(EC)
9	Enzymes always end with the suffix ".....".	Colloidal particles
10	Enzymes are classified by the Enzyme Commission number.....	reduction stage
11	 imbibe water but do not have osmotic potential.	Chlorophyll a

6. Write down the missed labels on the sketch below (5 Points):



Best wishes,

[Signature]

Prof. Dr. Refat Abdel-Basset

	Assiut University- Faculty of Science Second Semester- Final Exam 2025-2026 Botany and Microbiology Department	Program: Level: (2) Date: 20/5/2026 Time: 2 h	
Course Title: Plant Cell – Biotechnology Program Students		Code: 209 BT	
Instructors: Prof. Dr. Ahmed Amro			
Important:	No. of pages 2	No. Of questions 1 (50 points)	Total Mark: 50 degrees

Choose the correct answer..... (50 marks)

- The process of synapsis, where homologous chromosomes pair up to form bivalents, takes place during: (A) Zygotene (B) Diplotene (C) Leptotene (D) Pachytene
- Water constitutes approximately what percentage of total weight of the plasma membrane? (A) 5% (B) 15% (C) 29% (D) 50%
- Under a light microscope, the plasma membrane is typically only visible during (A) Turgidity (B) Cyclosis (C) Plasmolysis (D) Cytokinesis
- Tracheids in protoxylem are characterized by annular or spiral thickenings in (A) Parenchyma (B) Protoxylem tracheids (C) Vessels (D) Sclereids
- Thick deposition of _____ in xerophytic (desert) plants helps prevent excessive water loss. (A) Pectin (B) Suberin (C) Cutin (D) Cellulose
- The theory that mitochondria and chloroplasts originated from ancestral prokaryotic cells is the (A) Cell Theory (B) Gene Theory (C) Endosymbiotic Theory (D) Spontaneous Generation
- The term “mitochondrion” was coined in 1897 by (A) Camillo Golgi (B) Benda (C) Richard Altmann (D) Robert Brown
- The structure that holds two sister chromatids together is the (A) Centriole (B) Centromere (C) Spindle fiber (D) Cell plate
- The protoplast is described as a highly organized structure composed primarily of (A) Pure water (B) Inorganic minerals (C) Organic compounds and inorganic substances (D) Lipids only
- The plasma membrane separating the protoplast from the central vacuole is the (A) Endoplast or Tonoplast (B) Ectoplast (C) Mesoplast (D) Periplast
- The pit type that maintains a uniform diameter throughout its depth is (A) Bordered pit (B) Simple pit (C) Branched pit (D) Blind pit
- The middle lamella separates protoplasts of daughter cells and primarily arises during (A) Prophase (B) Metaphase (C) Anaphase (D) Telophase
- The glycocalyx primarily functions in (A) Protection and recognition (B) ATP synthesis (C) Lipid metabolism (D) DNA replication
- The fluid mosaic model was proposed by (A) Robert Hooke (B) Singer and Nicolson (C) Robertson (D) Schleiden
- The domain containing soluble enzymes of the Krebs cycle is the (A) Outer membrane (B) Intermembrane space (C) Matrix (D) Inner membrane
- The dense, non-membrane-bound structure in the nucleus responsible for ribosome synthesis is the (A) Nucleosome (B) Nucleolus (C) Centromere (D) Kinetochore
- The currently accepted membrane structure model emphasizing semi-fluid nature is the (A) Sandwich Model (B) Fluid Mosaic Model (C) Micellar Model (D) Solid Lattice Model
- The Cell Theory stating that plants and animals are composed of fundamental structural and physiological units was formulated by ? (A) Watson and Crick (B) Schleiden and Schwann (C) Ernst Haeckel (D) Robert Hooke
- The “Unit Membrane” model proposed by a trilaminar protein-lipid-protein structure was suggested by (A) Altmann (B) Robertson (C) Robert Hooke (D) Singer and Nicolson
- The “living body” embedded within the cytoplasmic matrix is (A) Vacuole (B) Mitochondria (C) Cell wall (D) Starch grain
- Which specialized unit, located on the inner surface of the thylakoid membrane, serves as the structural and functional site of light-dependent photosynthetic reactions? (A) Quantasome (B) Oxysome (C) Dictyosome (D) Ribosome
- Rough ER differs from smooth ER because it has (A) Lipids (B) Golgi bodies (C) Attached ribosomes (D) Pores
- The physical exchange of genetic segments between non-sister chromatids occurs during which stage of Prophase I? (A) Zygotene (B) Pachytene (C) Leptotene (D) Diakinesis
- Protoplasmic threads connecting cytoplasm of adjacent plant cells are known as (A) Plasmodesmata (B) Pits (C) Pectin (D) Desmosomes
- Proteins permanently anchored and embedded within the lipid bilayer are classified as _____ proteins. (A) Integral (B) Extrinsic (C) Peripheral (D) Surface

26. Plastids repurposed/aging and commonly seen in autumn as chlorophyll is lost are (A) Chromoplasts (B) Gerontoplasts (C) Chloroplasts (D) Etioplasts
27. Pitted, reticulate, and scalariform patterns are most commonly observed in (A) Metaxylem and secondary xylem (B) Protoxylem and primary xylem (C) Phloem fibers (D) Sieve tubes
28. Phospholipids are polar molecules because they have (A) two ends with different properties (B) only found at cell poles (C) only fatty acids (D) they cannot move within the bilayer
29. Mitochondria and chloroplasts are described as "semi-autonomous" because they possess the genetic machinery to: (A) Replicate their own DNA and synthesize some of their own proteins (B) Synthesize all necessary cellular proteins independently (C) Function outside of the host cell in a nutrient-rich medium (D) Undergo mitosis and meiosis alongside the nucleus
30. Meiosis differs from mitosis primarily because it (A) occurs in somatic cells (B) results in two identical cells (C) reduces chromosome number by half (D) involves only one division
31. Long, flattened, sac-like unbranched tubules of the ER are (A) Vesicles (B) Tubules (C) Grana (D) Cisternae
32. In the phospholipid bilayer, the lipid "tails" are (A) Hydrophobic (B) Polar (C) Hydrophilic (D) Charged
33. In the fluid mosaic model, "amphipathic" refers to molecules that contain (A) are entirely soluble in water (B) are entirely insoluble in water (C) contain both hydrophilic and hydrophobic groups (D) lack any electrical charge
34. In mitosis, sister chromatids separate and move toward opposite poles during (A) Prophase (B) Metaphase (C) Anaphase (D) Telophase
35. In aquatic plants (hydrophytes), the cuticle is generally (A) Thin or absent (B) Highly lignified (C) Very thick (D) Suberized
36. When evaluating the structural similarities between mitochondria and chloroplasts, which specific feature supports the theory that they evolved from ancestral gram-negative bacteria? (A) The presence of linear DNA within the matrix (B) A double-membrane envelope with a porin-rich outer layer (C) The utilization of 80S ribosomes for protein synthesis (D) The presence of a single unit membrane similar to the tonoplast
37. Finger-like outgrowths of the inner mitochondrial membrane are (A) Grana (B) Cisternae (C) Cristae (D) Thylakoids
38. Which sub-stage of Prophase I is characterized by the breakdown of the nuclear envelope and the formation of the spindle? (A) Diakinesis (B) Pachytene (C) Leptotene (D) Zygotene
39. Exchange of genetic material between homologous chromosomes during Prophase I is (A) Mutation (B) Crossing over (C) Fertilization (D) Cytokinesis
40. Which phase of the cell cycle is dedicated to DNA replication before any nuclear division begins? (A) G1 phase (B) G2 phase (C) S phase (D) M phase
41. Cell wall growth by depositing new particles on the surface of the existing wall is (A) Intussusception (B) Apposition (C) Calcification (D) Fragmentation
42. Casparian stripes formed by irregular suberin deposition are found in the (A) Xylem vessels (B) Phloem companion cells (C) Root endodermis (D) Trichomes
43. Branched pits are typically observed in (A) Parenchyma cells (B) Stone cells of fruits (C) Sieve elements (D) Meristematic cells
44. Approximate total thickness of the plasma membrane (ectoplast) is (A) 10–20 Å (B) 50–60 Å (C) 75–100 Å (D) 200–300 Å
45. A primary distinction between prokaryotic and eukaryotic cells is the presence of an (A) cell wall (B) cytoplasm (C) organized nucleus (D) ability to reproduce
46. A leucoplast involved specifically in storage of starch is the (A) Elaioplast (B) Amyloplast (C) Proteinoplast (D) Chromoplast
47. During which mitotic stage does the nuclear envelope break down as chromatin condenses into visible structures? (A) Metaphase (B) Telophase (C) Prophase (D) Anaphase
48. Meiosis II is often referred to as "equational division" because it primarily involves the separation of: (A) Homologous chromosomes (B) Bivalents (C) Tetrads (D) Sister chromatids
49. Chromosomes arrive at opposite poles and begin to decondense during which final stage of mitosis? (A) Prophase (B) Metaphase (C) Telophase (D) Anaphase
50. Within the chloroplast architecture, the colorless matrix containing the soluble enzymes required for the Calvin Cycle is the: (A) Grana (B) Lumen (C) Stroma (D) Periplasmic space

End of Exam

Best Wishes Prof. Dr. Ahmed Amro

	Assiut University- Faculty of Science First Semester- Final Exam 2025-2026 Botany and Microbiology Department	Program: Third level Level: (3) Date: 31/12/2025 Time: 2 h	
Course Title: Plant cytology		Code: 323N	
Instructors: Prof. Dr. Mona Fathi AbdElmowla Dawood			
Important:	No. of pages 3	No. Of questions 3	Total Mark:50 degree

Answer the following questions

Question 1: Choose the correct answers (1 mark each= 20 marks)

1	Which organelle uses information from DNA to synthesize proteins? a. Nucleus b. Chloroplast c. Ribosome d. Golgi apparatus	
2	 faces the nucleoplasm and contains distinct set of integral membrane proteins. a. Perinuclear cisterna b. Perinuclear membrane c. Inner nuclear membrane d. Nuclear lamina	
3	In endodermis, the deposition of is, as in casprin stripe. a. subrinregular b. subrinirregular c. ligninregular d. ligninirregular	
4	Unit Membrane Model is a model that describes the membrane as a trilaminar a. True b. False	
5	 provide strength to cell membrane, while attaching to the cytoskeleton and extracellular matrix to maintain the cell shape. a. Integrin b. Porphyrin c. Xylin d. Erythrin	
6	The inner surface of the thylakoid membrane is granular in the organization due to small spheroidal a. quantosomes b. photosystems c. chlororibosomes d. a and b	
7	 in the outer membrane allow small molecules to be exchanged between the cytoplasm and the intermembrane space. a. Oxsomes b. porins c. cristae d. cisternae	
8	 chromosomes in which arms' lengths are unequal with L- or J-shaped chromosomes a. Submetacentric b. Metacentric c. Acrocentric d. Telocentric	
9	 are membrane-bound, dense granular structures containing hydrolytic enzymes responsible for intracellular and extracellular digestion.	

	a. Peroxisomes	b. Chromomeres	c. lytotin	d. Lysosomes	
10	Some lysosomes contain paracrystalline core which is rich in urate oxidase a. True b. False				
11	Peroxisomes may be existed as a network of interconnected tubules called or individually called a. peroxisome reticulum microperoxisomes b. microperoxisomes peroxisome reticulum				
12	The inner mitochondrial membrane contains integral proteins a. three b. four c. five d. six				
13	Chromosomes bearing satellites are called SAT-chromosomes. a. True b. False				
14	is structure of multiple ribosomes when attached to the same mRNA strand during protein synthesis a. Polysome b. Microsome c. Multisome d. Svedbergsome				
15	 plastids that are going through the aging process. a. Amyloplast b. Gerontoplasts c. Proplastids d. Elaioplast				
16	The cellular power plant is a. Chondriosomes b. Bioblasts c. Cristae-containing organelle d. all the last				
17	Fucoxanthin is a red colored plastid mask the color of chlorophyll a in Phaeophyta a. True b. False				
18	The tertiary cell wall appears in certain plant tissues such as a. endodermis b. cuticle c. xylem d. meristems				
19	Which of the following is not right about pellicle..... a. It is a membrane bounds the chromosome b. It is formed of chromatic substances and protein c. It keeps the chromonema within bounds d. It encloses a jelly-like matrix				
20	The tubules of mitochondria are branched structures forming the reticular system along with the cisternae and vesicles. a. True b. False				

Question 2: Identify five only of the following terms (3 mark each= 15 marks)

- a. Cajal bodies
- b. Cisternae of dictyosomes
- c. Pseudo-vacuoles
- d. Oxysomes
- e. Peripheral membrane proteins
- f. Leptotene

Question 3: Write on five only of the following points (3 mark each= 15 marks)

- a. Chromonema
- b. The structure of cytoskeleton
- c. Structure–Function relationship in the chloroplast
- d. Development of cell wall
- e. Two functions of plasma membrane
- f. The small and large subunits of ribosomes in prokaryotes and eukaryotes

..... **End of Exam**

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Best wishes

Dr. Mona Fath H. Dawood

Dr. Mona F.A. Dawood

	Assiut University- Faculty of Science Botany & Microbiology Department First Semester- Final Exam 2025- 2026	Program: (Biotechnology) Level: 2 Date: 30/1/2026 Time: 2 h	
Course title: Bacteriology		Cod: 203 B	
Instructor: Prof. Dr. Mohamed Hemida Abd-Alla			
Important :	No. of Pages: 5	No. of questions:5	Total Mark: 50 degrees

General Instructions: -Answer the following questions in space provided.

Q1. Place a tick ✓ in the correct answer (Ten only). 10 Marks

- Which one of the following encloses the rhizobia upon their release into the host cell cytoplasm
 - Cell Wall
 - Symbiosome
 - Peribacteroid Membrane
 - Plasma Membrane
- Which scientist introduced antiseptic surgery?
 - Semmelweis
 - Lister
 - Koch
 - Erlich
- Which of the following is true about transcription elongation of bacteria?
 - RNA is synthesized 3' to 5'
 - DNA is read 5' to 3'
 - RNA is synthesized 5' to 3'
 - DNA is unwound after transcription
- Which bacterial shape is described as flexible spiral?
 - Vibrio*
 - Bacillus*
 - Spirillum*
 - Treponema*
- Which signaling molecules induce the "shepherd's crook" root hair curling?
 - Lipopolysaccharides
 - lectins
 - Exopolysaccharides
 - lipochitooligosaccharide
- Which bacteria use fimbriae to resist flushing by urine?
 - Escherichia coli*
 - Neisseria gonorrhoeae*
 - Bacillus anthracis*
 - Streptococcus mutans*
- Which transcription termination mechanism involves a GC-rich hairpin loop followed by a U-rich tail?
 - ATP generation
 - DNA replication
 - Rho-dependent
 - Rho-independent
- Which of the following molecules is a coenzyme derived from niacin?
 - NAD
 - FAD
 - Coenzyme A
 - ATP
- Which of the following enzymes is classified as an oxidoreductase?
 - Lipase
 - Proteases
 - Dehydrogenase
 - Amylase
- Which of the following is true about the bacterial ribosome during translation?
 - The 50S subunit binds mRNA
 - The 30S subunit binds tRNA
 - The 30S subunit binds mRNA and the 50S binds tRNA
 - Both subunits bind DNA

Q2. Write the suitable definition for each scientific term. (10 Mark)

No	Scientific term	Definition
1	Spontaneous generation theory	
2	Water activity	
3	Chemoautotrophic bacteria	
4	feedback inhibition	
5	Constitutive enzymes	

Q3. Give reason(s) in space "provided below" for each of the following: (10 Mark)

1. Acid-fast bacteria resist decolorization.

2. Capsules increase bacterial virulence

3. Gram-positive bacteria retain the crystal violet stain.

4. Inhalation anthrax is considered a potential biological weapon.

5. Gram positive pathogenic bacteria killed by Vancomycin

6. Transcription regulation is important for bacteria

7. Growth factor is essential for bacterial growth

8. Gas vesicles are important for certain bacteria

9. Oxygen is lethal to anaerobic bacteria.

10. Leghemoglobin in the root nodules essential for nitrogen fixation to occur?

Q4. Write an Account in provided space in each of the following: (1Mark each)

1. Sigma Protein.

2. Inducible Enzyme.

3. Magnetosome.

4. Composition of nitrogenase

5. Sulfa drug

6. Transduction

7. lactose operon

8- High frequency recombination

9. Division of Sarcina

10. Phosphate-solubilizing bacteria and their mechanisms

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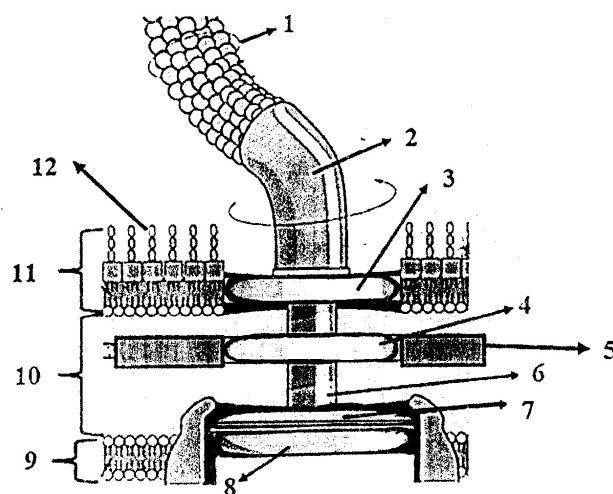
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Q5. Look at the diagram provided and answer the following: 10 Marks



1. Identify each of the labeled structures from 1-12 in the diagram. 6Marks

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

2. What is the name and position of the structure shown? 1 Mark

3. Which type of bacteria possess it? 1 Mark

4. What is the function of the provided structure? ½ Mark

5. What is the type of protein of the number (1)? ½ Mark

6. What is the name and function of the complete structure that includes numbers 3, 4, 6, 7, and 8?
1 Mark

Good Luck
Prof Dr Mohamed Hemida Abd-Alla

	Assiut University- Faculty of Science First Semester- Final Exam 2025-2026 Botany & Microbiology Department	Program: Different programs Level : (2) Date: 2/1/2026 Time: 2 h	 كلية العلوم جامعة اسيوط
Course Title: Virology		Code: 281B	
Instructors: Prof. Dr. Naeima M. H. Yousef			
Important:	No. of pages 2	No. Of questions 4	Total Marks:50 degree

Answer the following:

Q1: Choose the Correct Answer: (10 marks)

- 1- Virus word means poison in
a- Ancient Romans b- Ancient Egyptian c-Latin d- others
- 2- The plant virus infects whole plant parts except
a-leaves b-stem c-roots d-meristematic regions
- 3- The movement of virus in plant cells occurs through
a-plasmodesmata b- cell wall c-plasma membrane d-all of the mentioned
- 4- Transmission of viruses by vectors occurs by.....
a-Aphid b-seeds c- animals d- pollen grains
- 5- Plant viruses normally infect plants only through
a-fine pores b-lenticels c-wounds d-stomata
- 6- Defective viruses have a deletion of part of their.....
a-genetic material b-protein c-envelope d-capsid
- 7- Each plant virus group divided intomembers types.
a- three b- four c- two d- five
- 8- Infection of induces antibodies and may cause inflammation.
a-virion b- prions c- pseudovirion d-none of the mentioned
- 9- Atypical virus like agents such as
a- prions b-viroids c-pseudovirion d- all of the mentioned
- 10- Tymovirus group has Particle shape
a- isometric b-simple c-complex d- filamentous

انظر خلفه (باقي الأسئلة في الصفحة الثانية)

Q2: Illustrate the target from the cryptogram and solve the following: (5 marks)

R/1: $1.1/16 + 0.8/16 + 0.7/16$: U/E: S/Ne

Q3: Give the definitions for ten only of the following: (10 marks)

- 1-Necrosis 2-Chlorosis 3-Hyperplasia 4-Prions
5-Pseudovirion 6-circulative Persistent transmission
7-Latent period 8-mosaic 9-plant free virus 10-virology
11-virion 12-necrosis

Q4: Write on five only of the following: (25 marks)

- a- Virus-like symptoms with other causes
b-Transmission of Plant Viruses
c-Control of plant virus diseases
d-Rhabdovirus group
e-Function of viral capsid and viral envelope
f- Differences between Plant viruses and animal viruses
g-Visible symptoms of viruses on plant

Best Wishes

Prof. Naeima Yousef



Final Exam
2025-2026



Assiut University
Faculty of Science
Botany and Microbiology Department

Taxonomy of F. P. 232B
Time: 2 hours
Total score: 50 marks

Q1: True or false (20 marks):

1. Class Magnoliopsida contains a greater number of orders and families than class Liliopsida.
2. Family Mimosaceae flowers are typically actinomorphic.
3. The ovary in the family Apiaceae is superior and contains two locules.
4. The androecium in Malvaceae consists of indefinite stamens united into a staminal tube.
5. The androecium in Brassicaceae consists of six stamens in a tetradynamous arrangement.
6. Family Solanaceae is typically characterized by a persistent calyx.
7. A bract is a reduced, leaf-like structure that is typically associated with a flower.
8. The calyx is known as the outer essential whorl of a flower.
9. Trimerous flowers, where members are in threes, are characteristic of dicot plants.
10. A hermaphrodite flower is considered "perfect" because it contains both male and female reproductive organs.
11. Bi-celled pollen grain contains two generative cells.
12. In a hypogynous flower, the ovary is superior and positioned at the top of the receptacle.
13. The pappus is a modified calyx represented by hairy or feathery structures.
14. Staminodes are non-functional stamens that do not produce pollen.
15. Diplostemonous flowers have a number of stamens equal to the number of sepals and petals.
16. Anemophily refers to pollination facilitated by wind agents.
17. Advanced flowers tend to have fused members and a definite number of floral parts.
18. Panicles are inflorescences with multiple sessile flowers.
19. In dioecious plants, the male and the female flowers are located on different branches of the same plant.
20. In the cymose inflorescences, flowers are borne laterally in acropetal order.

Q2: Illustrate with drawing three only of the followings (15 marks; 5 marks each):

1. Different types of placentation.
2. Fusion of stamens.
3. Dehiscent fruits.
4. Pollen grain structure.

Q3: Write on three only of the following (15 marks; 5 marks each):

- 1- A monocot family.
- 2- The three subfamilies of family Rosaceae (androecium, gynoecium, ovary, and fruit).
- 3- Nyctaginaceae and Chenopodiaceae (perianth, androecium, fruit, and important plants).
- 4- Characteristics of family Lamiaceae (labiatae) and its important plants.

With my best wishes
Mostafa Ahmed Aboulela

	Assiut University- Faculty of Science	Material Science Program	
	Final Exam. 2025-2026 –First Semester	Level: 2 ^o	
	Botany and Microbiology Department	Date: 26/12/2025	
		Time: 2 hours	
Coarse Title: Plant Ecology		Code: 241 B	
Instructors: Prof. Dr. K.A. Farghali			
Important:	No. of pages:2	No. of questions: 4	Total Marks: 50 degrees

Answer on the following questions:

I- Define each of the followings:(15Marks)

1-Heliophytes, 2- solum, 3-plant zero, 4-wilting coefficient, 5- dew point, 6-lattice water, 7- duff, 8-ecosystem, 9- flagging growth, 10-thremoperiodism.

II-Choose the correct answer of followings: (15Marks)

1- Vigrous plants are growing well in:

a-sandy soil b-clay soil c- loamy soil d- silty soil.

2-Ecological energies means:

a-light energy b- chemical energy c- mechanical energy d- all the previous.

3-Photo-periodism is controlled by:

a-red b-infra-red c-far red violet..spectrum.

4-Mycorrhiza is an example of:

a-epiphytism b-parasitism c-sybiosis d- copetation.

5-Solonetz soils are reclaimate by addition of:

a-Ca(OH)₂ b- CaSO₄ c-NaCO₃ d- H₂ CO₃.

6-Visible vapour means:

a-snow b- humidity c- dew d- fog.

7-Glacial soil is trasported by:

a-wind b- water c- ice d-gravity.

8-Phototropism is greatly affected by:

a-red b- far-red c- infera-red d-bluelight.

9-Synecology deals with:

a--association b- community c-population. d- all the previous.

10-Hygroscopic water leave the soil partical at:

a-600 °C b-200 °C c-85 °C d-105 °C.

11-Vertical cut through soil is called:

a-structure b- composition c- texture d-profile.

III- Write on THREE ONLY of the followings: (15Marks)

1-Copare between : sciophytes and halophytes.

2-Give the benefits for plants of :a-low temperature, b-humus.

3-Explain briefly on the factors affecting soil temperature?

4- Discuss the effect of different solar spectrum on plants?

IV-Give an account on ONE only of the followings: (5Marks)

1-climatic changes,

2- global warming,

3- desertafication.

PROF.K.A. Farghali

GOOD LUCK

End of Exam.



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



Final Exam. For the 2nd level students (Biotechnology program) - May, 2026.
Subject: Biology of Water pollution (BT 292). Allowed Time: 120 Min.

Q.1- Give the scientific term or the name of the organism related to Only Eight of the following items. (Use the provided table for your answers):- (8 Marks)

- 1- The rapid and excessive growth of algae in water bodies due to enrichment with nutrients such as nitrogen and phosphorus.
- 2- The passive process by which living or dead biological materials adsorb and bind contaminants (like heavy metals) onto their cell surfaces without the need for metabolic activity.
- 3- The toxic secondary metabolites produced by fungi, particularly by species of *Aspergillus*, *Penicillium*, *Fusarium*, and other molds.
- 4- The bacterium which survives the longest in polluted waters and is therefore, could be regarded as an excellent indicator of fecal contamination, but it cannot be used as a specific indicator organism to distinguish between human and animal faecal contamination since it is excreted by both humans and animals.
- 5- The bacterium which was used as a specific indicator of animal faecal pollution.
- 6- Cyanotoxins that block protein phosphatases thus acting as cytotoxic compound, being liver their main target are referred as:-
- 7- The use of living organisms, such as bacteria, fungi, or plants, to degrade or neutralize harmful pollutants in the environment, particularly in water bodies.
- 8- All the individuals of a given species in a specific area or region at a certain time (i. e. a group of organisms of the same kind).
- 9- The proteinoid bacterial toxins which produced by Gram positive bacteria and powerful in lower doses.
- 10- The term used for water pollution that comes from a specific identifiable source.

A Table for your answers (You are required to answer only 8 points)

1		2	
3		4	
5		6	
7		8	
9		10	

Q2- 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- Fungi act only as primary producers in aquatic ecosystems.
- 2- Bioaccumulation is the active, energy-dependent process where living organisms absorb and accumulate contaminants (such as toxins or metals) inside their cells over time.
- 3- Fungi contribute large quantities of dissolved oxygen to aquatic ecosystems.
- 4- A community consists of all the organisms living in a particular area, and the sizes of communities can vary widely.
- 5- 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.
- 6- Most of the water-borne pathogens are introduced to water through faecal contamination.

- 7- Several of waterborne viruses have extremely low infectious doses; the probability of infection from exposure to one rotavirus particle is 31%.
- 8- Microorganisms coating the surface of rocks, stones and sand grains (the slippery coating on hard surfaces in rivers) are referred as community.
- 9- 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.
- 10- Freshwater ecosystem represents 80% of the earth surface.
- 11- Lentic term represents the fast flowing (rapidly moving) of water.
- 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	

Q.3: Using the provided table, choose the correct answer for 12 of the following:-

(12 Marks; One mark for each)

- Which of the following diseases is caused by microorganisms present in contaminated water?
A. Malaria. B. Cholera. C. Tuberculosis. D. Influenza. E- All the above.
- Oxygen depletion in water bodies is mainly caused by:
A. Photosynthesis. B. Decomposition by microorganisms. C. Water evaporation. D. Rainfall.
- Which of the following fungal genera is commonly found in polluted water?
A) *Aspergillus*. B) *Penicillium*. C) *Candida*. D) All of the above.
- Which of the following best describes fungi in polluted water?
A) Primary producers. B) Decomposers. C) Consumers only. D) Inorganic compounds
- 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.
- Using fungi for removal of various environmental pollutants is termed as:-
A). Phytoremediation. B). Phycoremediation. C). Mycoremediation. D). Both A&B.
- 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.
- Protozoa and other minute animal life are known as:-
A). Plankton. B). Phytoplankton. C). Zooplankton. D). Mycoplankton. E). None of all.
- Cholera is spread through contaminated water. What is cholera caused by?
A). Bacteria. B). Viruses. C). Fungi. D). Algae. E). Protozoa.
- 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.

12- 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.

13- Gill rot disease of fish is caused by:-

- A). *Saprolegnia parasitica*. B). *Aphanomyces*. C). *Exophiala*. D). *Fusarium*. E). None of all.

14- Which of the following compounds are required for the growth of saprophytic bacteria and fungi?. A). Organic compounds. B). Nitrates. C). Phosphates. D). Mercury.

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

1		2	
3		4	
5		6	
7		8	
9		10	
11		12	
13		14	

Q. 4- Match 8 only of List (I) with List (II) and select the correct answer:- (8 Marks).

I		II	
1	COD (Chemical Oxygen Demand)	A	<i>Fusarium</i> species
2	Water quality index	B	Organisms that break down organic matter
3	Poliovirus and enteroviruses	C	Protozoae
4	Decomposers	D	Lives in 70 -72 ⁰ C.
5	Industrial discharge	E	Organisms that break down organic matter
6	Algal bloom	F	Toxic metals in aquatic environments.
7	Fumonisin	G	Indicates overall status of water quality
8	<i>Thermus aquaticus</i>	H	Oxygen depletion in water
9	Industrial discharge	I	Attack the nervous system
10	Giardiasis	J	Rapid growth of algae due to excess nutrients

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

I	1	2	3	4	5	6	7	8	9	10
II										

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

(12 Marks)

1- Biofilm and its main functions.

2- Red tides, highlighting their causes and impacts.

3- Cyanotoxins.

4- Fungi as the water pollutants.

5- Pathogens in Water.

	Assiut University- Faculty of Science First Semester- Final Exam 2025-2026 Botany and Microbiology Department	Program: Plant and Microbial Biotechnology Level: (2) Date: 14/5/2026 Time: 2 h	
Course Title: Virology		Code: 202BB	
Instructors: Dr. Shymaa Ryhan			
Important:	No. of pages 2	No. of questions 2	Total Mark:50 degree

Answer the following questions: -

A. Answer **Only Five questions** of the following questions: (5 marks each)

1. Discuss the physiological effects of viral infections on plants.
2. Write on the laboratory methods used for virus detection.
3. List the main components of plant viruses.
4. Explain why viruses are considered living and non-living at the same time.
5. Describe the following cryptogram: R/1 : 2.3/5 + 1.3/5 : E/E : S/Ne
6. Compare between Circulative vs Non-circulative transmission

B. Choose the correct answer (25 marks)

1. If an aphid is allowed to sit on an infected leaf for 24 hours, that 24-hour duration is the:

- A) Acquisition Access Period
- B) Incubation Period
- C) Inoculation Feeding Period
- D) Viral Titer

2. A virus that infects many plant species has:

- A) Narrow host range
- B) No host range
- C) Broad host range
- D) Unlimited replication

3. Inclusion bodies in infected cells are:

- A) Nutrient storage structures
- B) Photosynthetic units
- C) Growth regulators
- D) Viral accumulations

4. Viral envelope is derived from:

- A) Viral DNA
- B) Capsid proteins
- C) Host cell membrane
- D) Ribosomes

5. Capsomeres are:

- A) Viral enzymes
- B) Subunits of capsid
- C) Lipid layers
- D) RNA molecules

6. Antibodies reduce infectivity by:

- A) Destroying viral DNA
- B) Heating the virus
- C) Increasing replication
- D) Binding to virus particles

7. Organic solvents mainly inactivate viruses by:

- A) Increasing pH
- B) Destroying lipids and proteins
- C) Reducing radiation
- D) Increasing temperature

8. Ultrasonic vibration inactivates viruses by:

- A) Heating
- B) Chemical reactions
- C) Cavitation and shear forces
- D) pH changes

9. Photoreactivation occurs due to:

- A) Heat
- C) UV radiation

- B) Visible light repair mechanism
- D) Freeze-thaw cycles

10. Fission agents act by:

- A) Breaking nucleic acids only
- C) Dissociating virus particles

- B) Increasing infectivity
- D) Stimulating replication

11. The real Father of Virology was:

- A) Mayer
- B) Ivanowski
- C) Stanley
- D) Beijerinck

12. Which plant part may escape viral infection?

- A) Meristems
- B) Leaves
- C) Stems
- D) Flowers

13. Which scientist proved viruses contain protein?

- A) Mayer
- B) Ivanowski
- C) Stanley
- D) Beijerinck

14. Aphids transmit viruses mainly through:

- A) Roots
- B) Leaves only
- C) Seeds
- D) Phloem feeding

15. In plant viruses, protein is:

- A) Minor component
- B) Major component
- C) Absent
- D) Only in envelope

16. Which statement is correct?

- A) Viruses are assembled using host machinery
- C) Viruses reproduce independently
- B) Viruses grow in size like cells
- D) Viruses divide by mitosis

17. The latent period refers to:

- A) Time before infection
- C) Growth phase
- B) Host resistance
- D) Time before vector becomes infective

18. Helper virus function is to:

- A) Provide coat protein or factor
- C) Kill vector
- B) Inhibit transmission
- D) Destroy virus

19. Acquisition feeding period refers to:

- A) Movement time
- C) Vector resistance
- B) Actual feeding time to acquire virus
- D) Total life cycle

20. Transmission threshold period is:

- A) Maximum transmission time
- C) Vector survival time
- B) Virus replication period
- D) Minimum time for acquisition + inoculation

21. Viruses may persist throughout the life of a plant.

- A) True
- B) False

22. Seeds from infected plants are always infected.

- A) True
- B) False

23. Viruses are always stable at extreme pH.

- A) True
- B) False

24. All viruses require vectors for transmission.

- A) True
- B) False

25. Tobacco ringspot virus infects a large proportion of seeds.

- A) True
- B) False

End of Exam

Best Wishes

Dr. Shymaa Ryhan

	Assiut University- Faculty of Science- Botany and Microbiology Department Second Semester Final Exam 2025-2026	Program: Chemistry and Botany Level: 2 Date: 7/6/2026 Time: 3 h	
Course Title: Enzymes and Plant Hormones		Code: B 252	
Instructors: Dr. Mona Fathi and Dr. Huwida Abdel-Kader Ahmed			
No. of pages: 8	No. of questions: 5	Total Mark: 50 degrees	

Part 1: Enzymes

First Question:

(10 marks)

A) Put (✓) or (X) in front of the following phrases: (5 marks)

- 1- Urease is an example for relative specificity of enzymes. ()
- 2- Isozymes have same k_m values. ()
- 3- Protein kinases catalyze the removal of phosphoryl groups from protein. ()
- 4 - In Encapsulation, enzymes are held or entrapped with suitable gels or fibers. ()
- 5- Value of V_{max} is Decreases during uncompetitive inhibition. ()

B) Choose the correct answer for each of the following: (5 marks)

- 1- Holoenzyme is correctly represented by
 - a) Enzyme – prosthetic group
 - b) Enzyme + prosthetic group
 - c) Enzyme + substrate
 - d) Enzyme + active site
- 2- The enzymes differ from inorganic catalysts in being:
 - a) Products of living cells
 - b) Proteinaceous in nature.
 - c) Specific in their action.
 - d) all of the above
- 3- According to the systematic name Hydrolases take the number
 - a) EC3
 - b) EC2
 - c) EC5
 - d) EC6
- 4- The synthetization of DNA is the primary function of the enzyme
 - a) Phosphatase
 - b) Mutase
 - c) Ligase
 - d) None of the above
- 5- Compartmentation is one form of enzyme
 - a) Purification
 - b) Regulation
 - c) Extraction
 - d) None of the above

Second Question:

(7 marks)

A) Identify two only from the following: (2marks)

1- Immobilization of enzymes

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1- Write what you know about enzyme specificity. (2.5 marks)

1- Write what you know about enzyme specificity. (2.5 marks)

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This image shows a full page of a handwriting practice worksheet. It consists of approximately 20 horizontal rows. Each row is defined by two parallel dotted lines, creating a series of uniform channels for letter height. The lines are evenly spaced and extend across the entire width of the page, providing a guide for consistent letter formation and alignment. There is no text or other markings on the page.

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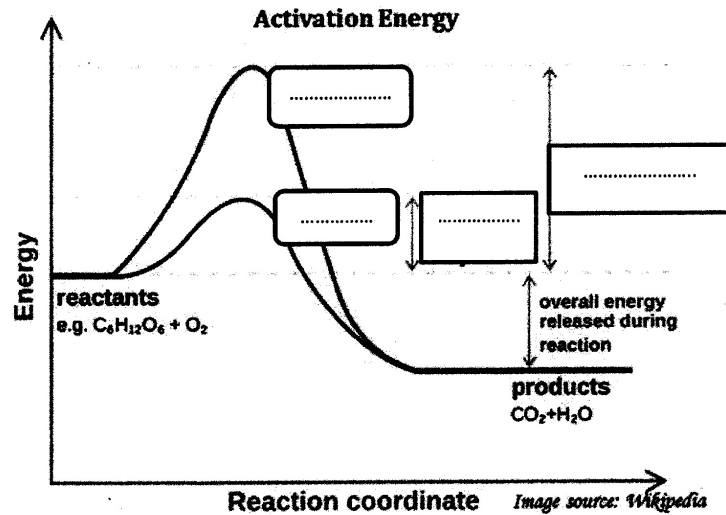
Third Question:

(7 marks)

A) Compare between the following (5 marks)

1- Competitive inhibitors	Non-Competitive inhibitors
2- Lock & key theory	Induced fit theory

B) Complete the missing words inside the rectangles in the following figure: (2 marks)



Part 2: Plant Hormones

Q1: Choose the correct answer: (0.5*20=10 marks)

1	The IPA (Indole-3-pyruvic acid) pathway is the most common pathway for auxin production from --- a. tryptamine b. indole-3-acetamide c. tryptophan d. indole-3-acetonitrile
2	The loss of auxin from cells is called ---, whereas the entry of auxin into cells is called ---. a. auxin efflux, auxin influx b. auxin uptake, auxin efflux c. auxin export, auxin import d. auxin activation, auxin inactivation
3	Basipetal transport of auxin in the root occurs through epidermal and cortical cells a. True b. False
4	The inhibition caused by high concentrations of auxin is due to stimulation of ----- synthesis. a. gibberellin b. ethylene c. cytokinin d. abscisic acid
5	Cell wall extension depends on the presence of -----, which become active under acidic conditions. a. Wall-loosening factors b. Wall pressure c. Turgor pressure d. Driving force
6	----- act as gravity sensors and have a higher density relative to the cytosol. a. Phototropins b. Flavoproteins c. Autoplasts d. Amyloplasts
7	In shoots, the ----- perceives the effect of gravity through the sheath, whereas in roots the site sensitive to gravity is the -----. a. Coleoptile, root cap b. Epidermis, plastids c. Coleoptile, cutin d. Bud, phloem
8	The localized accumulation of auxin in epidermal cells of root initiates the formation of lateral or secondary roots a. True b. False
9	Gibberellins are synthesized from -----.

This image shows a full page of white paper with horizontal dotted lines, typical of primary school writing paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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6. Bolting and flowering

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7. Vernalization and Parthenocarpy

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END OF EXAM..... With my best wishes

Dr. Mona Fathi AbdElmowla

Dr. Huwida Abdel-kader Ahmed

	Assiut University – Faculty of Science Second Semester – Final Exam 2025-2026 Botany & Microbiology Department	Program: Biotechnology Level: (2) Date: 5/6/2026 Time: 2 h	
Course Title: taxonomy of flowering plants		Code: 232 B	
Instructors: Prof. Momen Zareh			
Important:	No. of pages 2	No. of Questions 4	Total Mark: 50 degree

The first question:- (25 marks)

Choose the correct answer: - (1.0 mark each)

- The arrangement of sepals & petals in bud is known as:-
a. aestivation b. placentation c. duration d. modification
- If the sepals become colored like petals, it is called as:
a. sepaloid petals b. petaloid calyx c. tepals d. perianth
- non-functional stamens are called as:
a. staminal tube b. fertile stamen c. staminodes d. none of the preceding
- A condition when filaments & anthers are fused is known as:-
a. syngenesious b. synandrous c. syncarpels d. adelphous
- If stamens number = number of sepals or petals, arranged in 1 whorl, it is called:
a. isosepelous b. isopetalous c. isostemenous d. all the preceding
- When dichasial cyme ends into monochasial cyme, it is called as:-
a. biparous b. cincinnus c. verticillaster d. uniparous
- In raceme, the flowers arranged in succession called:-
a. basipetal b. acropetal c. centrifugal d. separate
- Cymose inflorescence with many lateral branches bearing flowers is:-
a. monochasial b. dichasial c. polychasial d. verticillaster
- Cyme with successive lateral branches develops on alternate sides (zigzag): -
a. corymb b. helicoid c. scorpioid d. verticillaster
- Fruit with single seed and pericarp fused with testa is called:-
a. caryopsis b. achene c. urticule d. nut
- Legume type of fruit is usually found in the family:-
a. Compositae b. Apiaceae c. Gramineae d. Fabaceae
- The edible part of banana is:-
a. meso- & endocarp b. epi- & mesocarp c. epicarp d. pericarp
- The seedless fruits are called:-
a. endocarpic b. schizocarpic c. parthenocarpic d. noncarpic
- The correct scientific name of Mango (المانجو) plant:-
a. *Mangifera sp.* b. *Mangifera indica* c. *Mangifera indica* L. d. all the preceding
- Four o'clock family that characterized by a petaloid tepals is:-
a. Lamiaceae b. Apiaceae c. Fabaceae d. Nyctaginaceae
- The plant family that characterized by papilionaceous flowers is called:-
a. Fabaceae b. Caesalpiniaceae c. Mimosaceae d. Brassicaceae
- Which of the following plants is belonging to family Chenopodiaceae:-
a. *Papaver somniferum* b. *Bougainvillea glabra* c. *Spinacia oleracea* d. *Gypsophila elegans*
- The plant family that characterized by umbel inflorescence and inferior ovary is called:-
a. Apiaceae b. Oleaceae c. Rosaceae d. Scrophulariaceae
- Which of the following plants is belonging to subfamily Rosoideae:-
a. *Rosa sp.* b. *Prunus armeniaca* c. *Pyrus malus* d. all the preceding
- Which of the following plants is belonging to family Iridaceae?
a. *Allium cepa* b. *Iris chrysophylla* c. *Ruscus alexandrinus* d. all the preceding
- Plant family that sometimes has 5-bilabiate petals (upper & lower lip) is: -
a. Lamiaceae b. Bignoniaceae c. Scrophulariaceae d. all the precedings
- The leaves of family Cyperaceae are arranged in: -
a. 1 - rank b. 2 - ranks c. 3 - ranks d. 4 - ranks
- Which of the following plants is belonging to family Solanaceae?
a. *Nerium oleander* b. *Mentha viridis* c. *Olea europaea* d. *Datura stramonium*
- Plant family that characterized by inferior gynoeceium and cremocarp is: -
a. Lamiaceae b. Apiaceae c. Brassicaceae d. Malvaceae
- Which of the following plants is not an ornamental plant?
a. *Freezia refracta* b. *Beta vulgaris* c. *Ruscus alexandrinus* d. Non of the preceding

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The second question:-

(25 marks)

- (i) Draw an illustration showing (4) types of racemose inflorescence (4 marks)
- (ii) Define:- hypogenous flower, deciduous calyx, synandrous & syncarpous (4 marks)
- (iii) Name different systems of classification. Give examples (2 marks)
- (iv) Compare between each of the followings:-
 - a. Rosoideae & Pyroideae according to stamens & carpels (2 marks)
 - b. Solanaceae & Convolvulaceae according to corolla & placentaion (2 marks)
- (v) Describe the floral characteristics of family Papaveraceae with floral diagram.
Enumerate 2 of the important plants. (6 marks)
- (vi) Give 1 botanical name and family of oil seed, vegetable, pulse, cereal & medicinal plant (5 marks)

Best Wishes
Prof. Momen Zareh

Q2): Select the correct term for each statement

(10 marks, one mark for each)

(Cleistothecium) - (Eucarpic fungi) - (Pleomorphic) - (Xenospores) -
 (Aplanospores) - (Apothecium) - (Acropetal succession) - (Thallospores) -
 (Synnema) - (Pycnidia)

1	Asci organized in a disc, or club-shaped ascocarp	
2	only a part of the thallus develops into the reproductive organs	
3	Spores were concerned with dispersal.	
4	Completely enclosed ascocarp with scattered asci	
5	are produced by transformation of pre-existing cells of the thallus and are detached by decay of the hyphae.	
6	is a large, erect reproductive structure borne by some fungi bearing compact conidiophores, which fuse together to form a strand resembling a stalk	
7	Non-motile sporangiospores	
8	The cells in the chain arranged whereas the oldest cell at the base and the youngest at the tip of chain	
9	Globose or flask-shaped with a narrow ostiole.	
10	the fungal reproductive cycle involves asexual and sexual phases	