Ultimate KCET Crash Course 2026

BOTANY

DPP: 1

Biological classification , Plant Kingdom

Q1 Gibberellic acid is a/an :
(A) Indole compound
(B) Terpene
(C) Adenine derivative
(D) Carotenoid

Q2 Match the columns and find out the correct combination:

Column-I		Column-II	
(a)	Auxin	(i)	Early seed production in conifers
(b)	Gibberellin	(ii)	Chloroplast formation
(c)	Ethylene	(iii)	Inhibits seed germination
(d)	Cytokinin	(iv)	Xylem differentiation
		(v)	Root hair formation

(A) (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)
(B) (a)-(v), (b)-(iii), (c)-(ii), (d)-(i)
(C) (a)-(iv), (b)-(i), (c)-(v), (d)-(ii)
(D) (a)-(ii), (b)-(v), (c)-(iii), (d)-(i)

Q3 Removal of apical bud results in:
(A) Formation of lateral branching
(B) Elongation of main stem
(C) Death of plant
(D) Formation of new apical bud

Q4 **Plasticity in plants refers to**
(A) Genetic variation
(B) Irreversible growth
(C) Ability to change growth forms
(D) Increase in surface area

Q5 Which application of auxins in agriculture best reflects their ability to stimulate root initiation?
(A) Increasing sugarcane yield
(B) Propagation through stem cuttings
(C) Breaking seed dormancy
(D) Accelerating fruit ripening

Q6 Parthenocarpy is induced by
(A) Ethylene
(B) Auxin
(C) ABA
(D) Cytokinin

Q7 **A common synthetic auxin is**
(A) NAA (B) GA_3
(C) Zeatin (D) ABA

Q8 **Growth curve of a plant is**
(A) Linear (B) S-shaped
(C) Circular (D) Rectangular

Q9 Newly formed meristematic cells arising from dedifferentiated tissues eventually mature into specialised tissues such as secondary xylem or cork. Which developmental process best describes this transition?
(A) Differentiation
(B) Redifferentiation
(C) Cellular expansion
(D) Senescence

Q10 A maize root apical meristem generates thousands of new cells every hour, whereas in a watermelon fruit the size of individual cells increases enormously. Which inference best explains these observations?
(A) Growth occurs only by cell enlargement
(B) Protoplasmic content remains constant during growth
(C) Cell division does not contribute to plant growth
(D) Growth can occur through increase in cell number or increase in cell size

Q11 Which component is not present in the cell envelope of gram-negative bacteria?
(A) Lipopolysaccharide outer membrane
(B) Thin peptidoglycan layer
(C) Thick peptidoglycan layer
(D) Plasma membrane

Q12 Which of the following criteria is not considered in Whittaker's five kingdom classification?
(A) Mode of nutrition
(B) Cell wall composition
(C) Complexity of body organization
(D) Method of locomotion

Q13 Who showed that viruses could be crystallized & crystals outside host-
(A) W.M. Stanley (1935)
(B) M.W.Beijerinek (1898)
(C) Dmitri Ivanowsky (1892)
(D) M.W. Stanley (1892)

Q14 Which of the following pairs is correctly matched?
(A) Phycomycetes – Rhizopus and Albugo
(B) Ascomycetes – Puccinia and Agaricus
(C) Basidiomycetes – Saccharomyces and Neurospora
(D) Deuteromycetes – Yeast and Mucor

Q15 Consider the following statements:
1. Cyanobacteria are photosynthetic autotrophs
2. They often form blooms in polluted water bodies
3. They lack membrane-bound organelles
4. Their cell wall contains chitin
Which of the above statements are correct?
(A) 1, 2, 3 only
(B) 1 and 3 only
(C) 2 and 4 only
(D) All of the above

Q16 Select the option that describes the characteristics of mycoplasma.
(A) Smallest living cell without a cell wall survives with oxygen
(B) Smallest living cell with a cell wall survives with oxygen
(C) Smallest living cell without a cell wall survives without oxygen
(D) Smallest living cell with a cell wall survives without oxygen

Q17 Which of the following is a characteristic feature of archaebacteria?
(A) Presence of peptidoglycan in cell wall
(B) Presence of histone-like proteins in DNA packaging
(C) Circular DNA inside nucleus
(D) Cell wall made of cellulose

Q18 The infectious material of viruses is:
(A) Protein coat
(B) Genetic material
(C) Nucleoprotein
(D) Tail fiber

Q19 After karyogamy followed by meiosis, spores are produced exogenously in _____.
(A) Neurospora (B) Alternaria
(C) Agaricus (D) Saccharomyces

Q20 Select the correct set of organisms that lack a cell wall.
(A) Entamoeba, Gonyaulax and Diatoms
(B) Mycoplasma, Euglena and Paramecium
(C) Trypanosoma, Plasmodium and Chlamydomonas
(D) Amoeba, Nostoc and Colletotrichum

Q21 Which of the following is found in seed plants?
(A) Complex vascular tissue
(B) Pollen grains replace swimming sperm
(C) Retention of megagametophyte within the ovule
(D) All of the above

Q22 Phycoerythrin and floridean starch are found in:
(A) Brown algae
(B) Blue-green algae
(C) Red algae
(D) Green algae

Q23 Which among the following is incorrect about cytotaxonomy and chemotaxonomy ?
(A) Cytotaxonomy is based on the number of chromosomes present in the organism.
(B) Chemotaxonomy is based on the chemical composition of plants.
(C) Cytotaxonomy is based on the behaviour of chromosomes.
(D) Cytotaxonomy involves only external characteristics

Q24 The sex organ in bryophytes are
(A) Reduced to single celled stage
(B) Multicellular
(C) Net cell developed
(D) Formed in sporophyte stage

Q25 The spore-bearing leaf of pteridophytes is called:
(A) Sporophyll (B) Microphyll
(C) Megaphyll (D) Sporophyte

Q26 The capsule in mosses is involved in:
(A) Vegetative propagation
(B) Water absorption
(C) Spore formation and dispersal
(D) Photosynthesis

Q27 Food reserve in Rhodophyceae (red algae) is
(A) Floridean starch
(B) Laminarin
(C) Mannitol starch
(D) Cyanophycean starch

Q28 The first stage in the gametophyte development of moss is:
(A) Spore mother cell
(B) Protonema
(C) Archegonium
(D) Capsule

Q29 Liverworts reproduce asexually by:
(A) Fragmentation (B) Gemmae
(C) Sporophyte (D) Protonema

Q30 Gymnosperms are -
(A) Heterosporous, haploid microspores and haploid megaspore
(B) Homosporous, both spores are haploid
(C) Heterosporous, both spores(microspores & megaspores) are diploid
(D) None of these

Answer Key

Q1	B
Q2	C
Q3	A
Q4	C
Q5	B
Q6	B
Q7	A
Q8	B
Q9	B
Q10	D
Q11	C
Q12	D
Q13	A
Q14	A
Q15	A
Q16	C
Q17	B
Q18	B
Q19	C
Q20	B
Q21	D
Q22	C
Q23	D
Q24	B
Q25	A
Q26	C
Q27	A
Q28	B
Q29	B
Q30	A

Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

B. Terpene.

Gibberellic acid belongs to the group of terpenes, which are a large class of organic compounds produced by plants. Terpenes play various roles in plant growth, development, and hormone regulation. Gibberellins are diterpenoids, a subclass of terpenes.

Video Solution:

Q2 Text Solution:

(C) a–(iv), b–(i), c–(v), d–(ii)

- Auxin Xylem differentiation.
- Gibberellin Early seed production in conifers.
- Ethylene Root hair formation.
- Cytokinin Chloroplast development.

Video Solution:

Q3 Text Solution:

(A)

- The apical bud produces auxins that suppress lateral buds.
- Removing the apical bud releases this inhibition.
- Lateral buds then start growing into branches.
- This phenomenon is called apical dominance.

Video Solution:

Q4 Text Solution:

Key Answer: Ability to change growth forms

1. Plants alter growth in response to environment.
2. Same plant shows different forms under different conditions.
3. Example: buttercup leaf variation.
4. Allows adaptation to surroundings.
5. It is a developmental feature.

Video Solution:

Q5 Text Solution:

Key Concept: Auxin functions

Explanation:

1. Auxins stimulate root formation in plant tissues.
2. This property is widely utilised in vegetative propagation.
3. Stem cuttings treated with auxins readily produce roots.
4. Such rooted cuttings develop into new plants.
5. Hence auxins are extensively used in horticulture.

Video Solution:

Q6 Text Solution:

- Parthenocarpy is fruit formation without fertilization.
- Auxins can induce seedless fruits.
- Applied externally to flowers.
- Used commercially in agriculture.
- Therefore, auxin induces parthenocarpy.

Video Solution:

Q7 Text Solution:

Key Answer: NAA

1. Naphthalene acetic acid is synthetic.
2. Used in horticulture.
3. Promotes root initiation.
4. Prevents premature fruit drop.
5. More stable than natural auxins.

Video Solution:

Q8 Text Solution:

Key Answer: S-shaped

1. Growth occurs in phases.
2. Lag phase log phase stationary phase.
3. Typical of most plant organs.
4. Reflects natural growth pattern.
5. Called sigmoid growth curve.

Video Solution:

Q9 Text Solution:

Key Concept: Redifferentiation

Explanation:

1. Dedifferentiated cells regain the capacity to divide and produce new cells.
2. These new cells later lose their ability to divide again.
3. They mature into specialised tissues with specific functions.
4. This second phase of specialization follows dedifferentiation.
5. The process is called redifferentiation.

Video Solution:

Q10 Text Solution:

Key Concept: Growth measurement

Explanation:

1. Growth at the cellular level involves increase in protoplasm.
2. This increase may occur through cell division producing more cells.
3. Alternatively, cells may enlarge greatly without significant division.
4. Maize root meristems show growth mainly through increase in cell number.
5. Watermelon fruit growth largely occurs through cell enlargement.

Video Solution:

Q11 Text Solution:

(C) Thick peptidoglycan layer

- Have **thin peptidoglycan** and outer lipopolysaccharide.
- Thick peptidoglycan is in **gram-positive bacteria**.
- Plasma membrane and periplasmic space present.
- Do not retain crystal violet dye.

Video Solution:

Q12 Text Solution:

(D) Method of locomotion

- Whittaker used cell structure, body organization, mode of nutrition & reproduction.
- Locomotion was **not** a classification criterion.
- Fungi and animals differ in locomotion but may fall under similar categories.
- Hence, locomotion was excluded from the five-kingdom system.

Video Solution:

Q13 Text Solution:

The Tobacco mosaic virus (TMV) is a positive-sense single-stranded RNA virus that infects tobacco and other members of the Solanaceae family. Wendell Meredith Stanley first crystallized TMV in 1935, revealing that the virus remains active even after crystallization. For his groundbreaking work, Stanley was awarded the Nobel Prize in Chemistry in 1946.

Video Solution:

Q14 Text Solution:

A – Phycomycetes – *Rhizopus* and *Albugo*

- Phycomycetes: aquatic or terrestrial, aseptate hyphae.
- Examples: *Rhizopus* (bread mould), *Albugo* (white rust).
- Mostly reproduce asexually by zoospores/aplanospores.
- Sexual reproduction via gametangial contact or fusion.

Video Solution:

Q15 Text Solution:

(A) 1, 2, 3 only

- They are photosynthetic autotrophs (chlorophyll-a).
- Form algal blooms in polluted water.
- Prokaryotic, lack membrane-bound organelles.
- Cell wall has peptidoglycan, not chitin.

Video Solution:

Q16 Text Solution:

Mycoplasma are the smallest living organisms, lacking a cell wall, and can survive in anaerobic conditions.

Video Solution:

Q17 Text Solution:

(B) Presence of histone-like proteins in DNA packaging

- Archaebacteria are **ancient prokaryotes**.
- Have **histone-like proteins** to organize DNA.
- Lack peptidoglycan in cell walls.
- Survive in **extreme environments**.

Video Solution:

Q18 Text Solution:

The genetic material (either DNA or RNA) within a virus is responsible for infecting host cells and directing the production of new viral particles.

Video Solution:

Q19 Text Solution:

In *Agaricus*, (member of Basidiomycetes), basidium commonly produces four meiospores or basidiospores exogenously. *Neurospora* (member of Ascomycetes) produces ascospores, endogenously inside the fruiting body, ascus. Alternaria (member of Deuteromycetes) does not produce any sexual spores. *Saccharomyces* (member of Ascomycetes) produces ascospores endogenously.

Video Solution:

Q20 Text Solution:

With cell wall- Diatoms (made of cellulose with silica embedded in it), *Chlamydomonas*, *Nostoc* (cyanobacteria), *Colletotrichum* (Chitin), *Gonyaulax* (cellulose)

Without cell wall - Euglena, Entamoeba (present only in cyst stage), *Mycoplasma*, *Paramecium*, *Trypanosoma*, *Plasmodium* and Amoeba

Video Solution:

Q21 Text Solution:

D) All of the above

Seed plants, also known as **gymnosperms** and **angiosperms**, exhibit several distinct features that set them apart from non-seed plants. Let's go over the options:

1. **Complex vascular tissue (Option A):**
   - Seed plants have **xylem** and **phloem** as their vascular tissues, which are well-developed and specialized for the transport of water, minerals, and nutrients throughout the plant. This is a characteristic feature of seed plants.
2. **Pollen grains replace swimming sperm (Option B):**
   - In seed plants, **pollen grains** carry the male gametes (sperm) to the female gametes (egg cells) through air or pollinators, instead of requiring water for sperm to swim to the egg, as seen in non-seed plants like ferns. This adaptation helps seed plants thrive in dry environments.
3. **Retention of megagametophyte within the ovule (Option C):**
   - In seed plants, the **megagametophyte** (female gametophyte) is retained within the **ovule**. This protects the developing gametophyte and is crucial for the production of seeds.

Video Solution:

Q22 Text Solution:

Phycoerythrin and floridean starch are characteristic of red algae (Rhodophyta). Phycoerythrin gives red algae their color, and floridean starch is their main storage polysaccharide.

Video Solution:

Q23 Text Solution:

(D)

- Cytotaxonomy studies chromosome number and behaviour.
- Chemotaxonomy uses chemical composition.
- Both are internal features, not just external ones.
- So, "involves only external characteristics" is incorrect.

Video Solution:

Q24 Text Solution:

In bryophytes, the sex organs are multicellular. The male sex organ is called an antheridium, which produces biflagellate antherozoids. The female sex organ, known as an archegonium, is flask-shaped and produces a single egg.

Video Solution:

Q25 Text Solution:

A) Sporophyll

1. In pteridophytes, sporangia are borne on specialized leaves.
2. These spore-bearing leaves are called sporophylls.
3. They may aggregate to form strobili or cones.
4. Sporophylls help in reproduction, not photosynthesis.

Video Solution:

Q26 Text Solution:

(C) Spore formation and dispersal

- Moss capsule is the spore-producing structure.
- It undergoes meiosis to form haploid spores.
- Spores are dispersed by peristome teeth mechanism.
- Hence, capsule helps in spore formation and dispersal.

Video Solution:

Q27 Text Solution:

(A)

- Red algae store food as floridean starch.
- It is similar to starch but distinct structurally.
- Stored in cytoplasm.
- Differentiates them from brown algae (laminarin, mannitol).

Video Solution:

Q28 Text Solution:

(B) Protonema

- Moss spores germinate to form protonema.
- Protonema is a juvenile, filamentous structure.
- It develops leafy gametophytic stage later.
- Thus, it is the first gametophyte stage.

Video Solution:

Q29 Text Solution:

(B) Gemmae

- Liverworts (e.g., *Marchantia*) show asexual reproduction.
- Gemmae are green, multicellular, asexual buds.
- They are produced inside gemma cups on thalli.
- Dispersed by rainwater, they form new plants.

Video Solution:

Q30 Text Solution:

(A) Heterosporous, haploid microspores and haploid megaspore

Gymnosperms produce two distinct types of spores – microspores and megaspores – both of which are haploid. This heterosporous condition differentiates them from homosporous plants where only one spore type is produced.

Video Solution: