CUET PG BOTANY 2024

Q.1 Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R). **[CUET PG 2024]**

Assertion (A): APG classification system is not useful for adoption in herbaria

and flora

Reason (R): APG system taxa have been classified only up to the level of family

In light of the above statements, choose the correct answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A).

2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A).

3. (A) is true but (R) is false.

4. (A) is false but (R) is true.

EXPLANATION: Both statements are true: the APG classification system is not widely adopted in herbaria and flora, and it's true that the APG system taxa have been classified only up to the level of family.

Q.2 Match List I with List II **[CUET PG 2024]**

LIST I(Processes)	LIST II(Changes)
A. Nudation	I. Creation of barren area
B. Ecesis	II. Establishment of species
C. Reaction	III. Community in equilibrium with organisms
D. Stabilization	IV. Modification of habitat

Choose the correct answer from the options given below:

1. (A)-(I), (B)-(II), (C)-(IV), (D)-(III)

2. (A)-(I). (B)-(III). (C)-(II). (D)-(IV)

3. (A)-(II). (B)-(I). (C)-(IV). (D)-(III)

4. (A)-(III). (B)-(IV). (C)-(I). (D)-(II)

EXPLANATION: “Nudation" refers to the process of creating barren areas, matching with (I)."Ecesis" is the establishment of species in a new area, aligning with (II)."Reaction" involves the modification of the habitat by the community, correctly linked with (IV)."Stabilization" describes the community reaching equilibrium with its environment, fitting with (III).

Q.3 Which of the following statement(s) is/are TRUE for Retting in Jute **[CUET PG 2024]**

(A). It is a kind of fermentation process

(B). It employs the action of bacteria on plants

(C). In this, the cortical tissues and phloem tissues of the bark of the plants which contains free strands are decomposed to separate fibre from non-fibrous woody stem

(D). This process does not involve any microorganisms and is purely the outcome of long soaking hours

Choose the correct answer from the options given below:

1. (A), (B) and (D) only.

2. (A), (B) and (C) only.

3. (A). (B). (C) and (D).

4. (B). (C) and (D) only.

EXPLANATION: Retting in jute production is a fermentation process where bacteria are employed to break down the plant material, particularly the cortical and phloem tissues of the bark. This action helps separate the fibers from the non-fibrous parts of the wood stem. Contrary to some statements, microorganisms are essential to this process, making it a biologically dependent method.

Q.4 'B' gene of ABCD flower model is made silenced in a plant. Which of the whorl is absent in the plant. [CUET PG 2024]

(A). Sepals

(B). Carpels

(C). Stamens

(D). Petals

Choose the correct answer from the options given below:

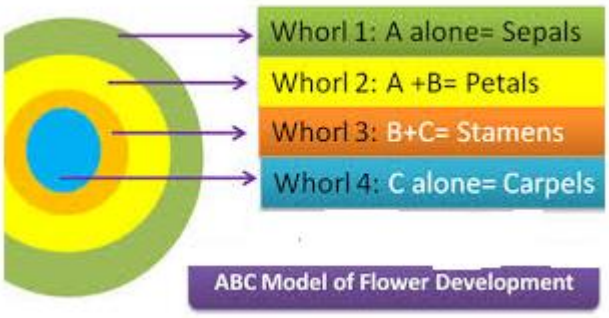
1. (B) and (D) only.

2. (B) and (C) only.

3. (A) and (B) only.

4. (C) and (D) only.

EXPLANATION:



In the ABC model of flower development, gene B is responsible for the formation of petals and stamens. When gene B is silenced, the plant lacks these specific floral organs. Therefore, the absence of petals and stamens is observed in flowers lacking the expression of gene B.

Q.5 Which of the following Gymnosperms possess winged pollen grains? [CUET PG 2024]

1. Dandelion

2. Cycas

3. Pinus

4. Ephedra

EXPLANATION: Among the listed options, Pinus is known for having winged pollen grains. These adaptations allow for better dispersal by wind, a common feature in many gymnosperms that rely on anemophily (wind pollination) for reproduction.

Q.6 Bryophytes are distinct from all other land plants in having an independent and a dependent,

[CUET PG 2024]

1. sporophyte, gametophyte

2. female, male

3. gametophyte, sporophyte

4. antherozoid, oogonia

EXPLANATION: Bryophytes are unique among land plants because they have an independent gametophyte stage, which is the dominant phase of their life cycle. The sporophyte, in contrast, is typically smaller and depends on the gametophyte for nutrition and support.

Q.7 The role of ethylene in plants is: [CUET PG 2024]

1. senescence of leaves and ripening of fruits

2. cell division

3. inhibition of root growth

4. production of tuber and bulb formation

EXPLANATION: Ethylene is a plant hormone primarily known for its roles in promoting the senescence (aging) of leaves and the ripening of fruits. This hormone accelerates cellular processes that lead to physiological changes in plant tissues, facilitating organic breakdown and nutrient recycling.

Q.8 Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R). [CUET PG 2024]

Assertion (A): Euchromatin is transcriptionally active and contains most of the protein-coding DNA.

Reason (R): Heterochromatin is light staining and less condensed portion of the chromatin.

In light of the above statements, choose the correct answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A).

2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A).

3. (A) is true but (R) is false.

4. (A) is false but (R) is true.

EXPLANATION: Assertion (A) is correct because euchromatin is indeed the transcriptionally active part of the genome and houses most protein-coding genes. Reason (R) is incorrect as heterochromatin is actually the dense, tightly packed form of DNA, which appears dark-staining, not light.

Q.9 In sweet pea, the development of purple-coloured flowers requires the presence of two dominant genes, C and R, e.g. CCRR. When either C (e.g. ccRR) or R (e.g.CCrr) or both the genes

(e.g.ccrr) are present in homozygous state, the purple colour of flowers CANNOT be produced. If CCrr (white) is crossed with ccRR(white), what will be the modified dihybrid ratio at F2 generation.

[CUET PG 2024]

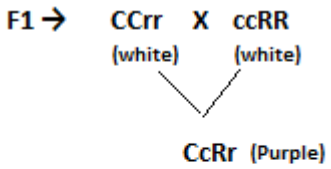
1. 15:1

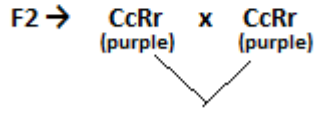
2. 13:3

3.9:3:4

4.9:7

EXPLANATION: When crossing CCrr with ccRR, where neither parent can produce purple flowers independently, the F2 generation will exhibit a modified dihybrid ratio due to the epistasis between genes C and R. This ratio reflects that purple flowers (CCRR) are rare. The correct expected ratio is 9 purple : 7 white, as both white (ccRR, CCrr, ccrr) will dominate without both C and R being present.





	CR	Cr	cR	cr
CR	CCRR (Purple)	CCRr (Purple)	CcRR (Purple)	CcRr (Purple)
Cr	CCRr (Purple)	CCrr (White)	CcRr (Purple)	Ccrr (White)
cR	CcRR (Purple)	CcRr (Purple)	ccRR (White)	ccRr (White)
cr	CcRr (Purple)	Ccrr (White)	ccRr (White)	ccrr (White)

Q.10 The decreasing order of concentration of greenhouse gases (GHGs) in the atmosphere is:

[CUET PG 2024]

(A). CO_2

(B). CH_4

(C). CFCs

(D). N_2O

Choose the correct answer from the options given below:

1. (A), (B), (C), (D).

2. (A). (C), (B), (D).

3. (B). (A), (D). (C).

4. (C), (B), (D), (A).

EXPLANATION: The most abundant greenhouse gas in the atmosphere is CO_2, followed by methane (CH4), nitrous oxide (N_2O), and then CFCs, which are present in much smaller quantities compared to the others.

Q.11 Which of the following is true about Poly(A) tail? **[CUET PG 2024]**

(A). Synthesizes post transcriptionally

(B). Usually shorter than 300 nt

(C). Its function is to protect the mRNA from cytoplasmic RNAases

(D). Its function is to stimulate translation

Choose the correct answer from the options given below:

1. (A). (B) and (D) only.

2. (A). (B) and (C) only.

3. (A), (B), (C) and (D).

4. (B). (C) and (D) only.

EXPLANATION: The Poly(A) tail is indeed synthesized post-transcriptionally , and it typically extends shorter than 300 nucleotides. This tail plays a crucial role in protecting mRNA from degradation by cytoplasmic RNAases and it also helps in the initiation of translation facilitating the binding of ribosomal subunits to the mRNA.

Q.12 Which types of protein is commonly found in RBC? [CUET PG 2024]

1. Glycoprotein

2. Spectrin

3. Ankyrin

4. Spectrin and Ankyrin

EXPLANATION: These are two key structural proteins found in red blood cells (RBCs). Spectrin forms a lattice-like structure that gives the cell its shape and flexibility, while Ankyrin helps anchor spectrin to the cell membrane, maintaining the cell's integrity and shape under stress.

Q.13 According to Vavilov, crop plants evolved from the wild species in the area which shows greater diversity and richness in variation. That area is called as: [CUET PG 2024]

1. Secondary gene centre

2. Non-centre

3. Primary gene centre

4. Centre for plant genome

EXPLANATION: According to Nikolai Vavilov, areas where crop plants show a high degree of diversity and richness in variation are known as primary gene centres. These regions are considered the origins of domesticated plants, where the wild ancestors of current crops exhibit great genetic diversity.

Q.14 Selenocysteine is an amino acid, which is:

1. present in only prokaryotes

2. coded by UGA

3. derived from cysteine

4. is present in many eukaryotic proteins

EXPLANATION: Selenocysteine is an amino acid coded by the UGA codon, which typically signals stop in mRNA translation. This unique feature makes it known as the "21st amino acid." It is derived from serine during protein synthesis, not cysteine.

Q.15 The ideal value for the backbone dihedral angles for antiparallel β-sheets are: -

[CUET PG 2024]

(A). φ-120° and ψ+125°

(B). ϕ -139° and ψ +135°

(C). ϕ -120° and ψ +130°

(D). ϕ -115° and ψ +140°

Choose the correct answer from the options given below:

1. (A) and (D) only.

2. (B) only

3. (A). (B) and (C) only.

4. (B). (C) and (D) only.

EXPLANATION: The ideal backbone dihedral angles for antiparallel β-sheets, based on empirical data from known protein structures, are generally close to ϕ = -139° and ψ = +135°. This combination allows the formation of extended, hydrogen-bonded sheets that are typical in antiparallel β-sheet structures.

Q.16 What is the major secondary metabolite present in Clove buds? **[CUET PG 2024]**

1. Thymol

2. Eugenol

3. Zingiberine

4. Piperine

EXPLANATION: The major secondary metabolite present in clove buds is Eugenol. Eugenol is a phenolic compound primarily responsible for the aromatic smell and flavor of cloves. It also has antiseptic and anesthetic properties, making it a valuable component in dental applications and traditional medicine.

Q.17 Match List I with List II **[CUET PG 2024]**

LIST I	Group-1	LIST II	Group-2
A.	VNTR sequence	I.	Gene regulation of the same chromosome
B.	Leader sequence	II.	Ribosome binding site
C.	SD sequence	III.	DNA finger printing
D.	Cis-acting sequence	IV.	Function in attenuation

Choose the correct answer from the options given below:

1. (A)-(I), (B)-(II), (C)-(III). (D)-(IV)

2. (A)-(III). (B)-(IV). (C)-(II). (D)-(I)

3. (A)-(I). (B)-(II). (C)-(IV). (D)-(III)

4. (A)-(III). (B)-(IV). (C)-(I). (D)-(II)

EXPLANATION: A. VNTR sequence is used in DNA fingerprinting (III).B. Leader sequence functions in attenuation (IV).C. SD sequence (Shine-Dalgarno sequence) is the ribosome binding site in prokaryotic mRNA (II).D. Cis-acting sequence is involved in gene regulation of the same chromosome (I).

Q.18 In the Polyacrylamide Gel Electrophoresis, what is the role of APS (ammonium per sulphate)?

[CUET PG 2024]

1. It is an alkylating agent that is used with TEMED to catalyze the polymerization of acrylamide and bisacrylamide

2. It is a reducing agent that is used with TEMED to catalyze the polymerization of acrylamide and bisacrylamide

3. It is an oxidizing agent that is used with TEMED to catalyze the polymerization of acrylamide and bisacrylamide

4. It is a mutagenic agent that is used with TEMED to catalyze the polymerization of acrylamide and bisacrylamide

EXPLANATION: Ammonium persulfate (APS) in polyacrylamide gel electrophoresis acts as an oxidizing agent. It is used along with TEMED (tetramethylethylenediamine) to catalyze the polymerization of acrylamide and bisacrylamide, forming the gel matrix used in this electrophoretic technique.

Q.19 Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R). **[CUET PG 2024]**

Assertion (A): Osmosis is a special type of diffusion in which movement of substances occurs from higher solute concentration to lower solute concentration.

Reason (R): Diffusion is dominant mode of transport at the scale of a cell. In light of the above statements, choose the correct answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A).

2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A).

3. (A) is true but (R) is false.

4. (A) is false but (R) is true.

EXPLANATION: Assertion (A) is false because osmosis is the movement of water (solvent) across a semi-permeable membrane from an area of lower solute concentration to an area of higher solute concentration, not from higher to lower solute concentration as stated. Reason (R) is true as diffusion is indeed a dominant mode of transport at the cellular level, particularly for small molecules across cell membranes.

Q.20 The total number of ATP is required for the conversion of one N_2 to 2 NH4" during biological N_2 fixation? [CUET PG 2024]

1. 8 ATP

2. 10 ATP

3. 12 ATP

4. 16 ATP

EXPLANATION: The conversion of one molecule of N_2 to two molecules of NH_4^+ during biological nitrogen fixation requires 16 ATP. This energy-demanding process is catalyzed by the enzyme nitrogenase, which uses ATP to reduce atmospheric nitrogen into ammonia.

Q.21 Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R). [CUET PG 2024]

Assertion (A): The zone of transition between two communities is called an ecotone

Reason (R): The ecotone has more diversity than either of the two communities

In light of the above statements, choose the correct answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A).

2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A).

3. (A) is true but (R) is false.

4. (A) is false but (R) is true.

EXPLANATION: Assertion (A) is true as an ecotone is indeed the transitional zone between two different ecosystems or communities. Reason (R) is also true because ecotones often harbor species from both adjacent communities and can support unique species as well, increasing biodiversity.

Q.22 Match List I with List II **[CUET PG 2024]**

LIST I (Economically useful plant)	**LIST II (Family)**
A. Corchorus sp.	I. Piperaceae
B. Rosa damascene	II. Malvaceae
C. Piper nigrum	III. Rosaceae
D. Curcuma longa	IV. Zingiberaceae

Choose the correct answer from the options given below:

1. (A)-(II), (B)-(III), (C)-(IV). (D)-(I)

2. (A)-(II). (B)-(III), (C)-(I). (D)-(IV)

3. (A)-(I), (B)-(II). (C)-(IV). (D)-(III)

4. (A)-(III). (B)-(IV). (C)-(I), (D)-(II)

EXPLANATION:

- Corchorus sp. (source of jute) belongs to the Malvaceae family.
- Rosa damascene (Damask rose) is part of the Rosaceae family.
- Piper nigrum (black pepper) belongs to the Piperaceae family.
- Curcuma longa (turmeric) is in the Zingiberaceae family.

Q.23 The alternate host for Puccinia graminis is **[CUET PG 2024]**

1. Delonix regia

2. Thalictrum falvum

3. Muehlenbergia hugeli

4. Berberis vulgaris

EXPLANATION: The alternate host for *Puccinia graminis*, a fungus causing wheat rust, is *Berberis vulgaris*. This plant serves as a secondary host where the fungus completes part of its lifecycle.

Q.24 The shape of chloroplast in Spirogyra is **[CUET PG 2024]**

1. Cup-shaped

2. Spiral

3. Girdle shaped

4. Discoid

EXPLANATION: In Spirogyra, a common freshwater green alga, the chloroplasts are distinctively shaped like spirals, which run lengthwise through the cell.

Q.25 What is the correct sequence of the steps which takes place in Polymerase Chain Reaction (PCR)? [CUET PG 2024]

1. Annealing. Extension, Denaturation

2. Denaturation, Annealing. Extension

3. Extension, Denaturation, Annealing

4. Denaturation, Extension, Annealing

EXPLANATION: PCR (Polymerase Chain Reaction) proceeds in three main steps: Denaturation (where DNA strands are separated), Annealing (where primers bind to the DNA), and Extension (where new DNA strands are synthesized).

Q.26 There are different possible glucuronides that can be used as substrates for the B-glucuronidase (GUS-reporter system), depending on the type of detection needed. The most common substrate for GUS histochemical staining is? [CUET PG 2024]

1. Galactic acid

2. 5-chloro-4-bromo-3-indolyl glucuronide

3. 5-bromo-4-chloro-3-indolyl glucuronide

4. 5,5'-dibromo-4,4'-dichloro-indigo

EXPLANATION: The most common substrate used for GUS histochemical staining in the GUS-reporter system is 5-bromo-4-chloro-3-indolyl glucuronide. This substrate is cleaved by GUS enzyme, resulting in a visible blue product.

Q.27 Hanstein proposed - [CUET PG 2024]

1. Apical cell theory

2. Histogen theory

3. Tunica corpus theory

4. Histogen layer theory

EXPLANATION: Hanstein proposed the Histogen theory, which describes plant tissue differentiation into three distinct layers: the dermatogen (forming the epidermis), periblem (forming the cortex), and plerome (forming the vascular tissues).

Q.28 The specimen collected from the same locality from where the holotype was collected is called as [CUET PG 2024]

1. Isotype

2. Topotype

3. Syntype

4. Paratype

EXPLANATION: A specimen collected from the same locality from where the holotype was collected, and often at the same time, is called a topotype. This term is used when referring to specimens that provide additional data about the type locality.

Q.29 Name the fungus whose extract from the sclerotia can be used to produce a powerfull hallucinogenic drug? [CUET PG 2024]

1.Agaricus

2. Claviceps purpurea

3. Alternaria solani

4. Neurospora crassa

EXPLANATION: Claviceps purpurea, a fungus that infects grains, particularly rye, produces sclerotia known as ergot. Extracts from these sclerotia contain ergotamine, which can be chemically modified to produce lysergic acid diethylamide (LSD), a powerful hallucinogenic drug.

Q.30 Match List I with List II [CUET PG 2024]

LIST I (Numerical Change in Chromosome)	**LIST II (Symbolic representation)**
A. Autotetraploid	I. 4x
B. Nullisomy	II. 2x (1) +2x (2) +2x (3)
C. Monosomy	III. 2n -2
D. Allohexaploid	IV. 2n-1

Choose the correct answer from the options given below:

1. (A)-(I), (B)-(II), (C)-(III). (D)-(IV)

2. (A)-(I). (B)-(III). (C)-(IV). (D)-(II)

3. (A)-(I). (B)-(II). (C)-(IV). (D)-(III)

4. (A)-(III). (B)-(IV). (C)-(I). (D)-(II)

EXPLANATION: Autotetraploid has four sets of chromosomes, represented as 4x.Nullisomy means missing both chromosomes of a pair, represented as 2n - 2.Monosomy indicates missing one chromosome from a pair, represented as 2n - 1.Allohexaploid has six sets of chromosomes from different species, represented as 2x (1) + 2x (2) + 2x (3).

Q.31 A stele which does NOT contain a central pith is called as: [CUET PG 2024]

1. Solenostele

2. Dictyostele

3. Protostele

4. Siphonostele

EXPLANATION: A protostele is the simplest type of stele, consisting of a solid core of vascular tissue without any pith. It is typical of the earliest vascular plants and some roots of modern plants.

Q.32 Jasmonic acid **[CUET PG 2024]**

1. is synthesized from linolenic acid

2. is growth promoter

3. delays leaf senescence

4. present in the mosses and ferns

EXPLANATION: Jasmonic acid is synthesized from linolenic acid through the octadecanoid pathway.It is not primarily a growth promoter; it mainly functions in stress responses and defense.Jasmonic acid promotes leaf senescence, not delays it.Jasmonic acid is present in higher plants and has significant roles in signaling, particularly in response to mechanical stress and wounds.

Q.33 Who discovered the heterothallism in fungi? **[CUET PG 2024]**

1. AF Blakeslee

2. Alexander Flemming

3. MP Iyenger

4. Alexopoulos and Mims

EXPLANATION: AF Blakeslee was the scientist who discovered heterothallism in fungi. His work with the bread mold Mucor led to the understanding that fungi can have different mating types, essential for sexual reproduction.

Q.34 Match List I with List II **[CUET PG 2024]**

LIST I (Chemical nature of side chain)	LIST II (Amino Acid)
A. Aliphatic amino acid	I. Pro
B. Sulphur containing	II. Gln
C. Imino	III. Val
D. Amide	IV. Cys

Choose the correct answer from the options given below:

1. (A)-(I), (B)-(II), (C)-(III). (D)-(IV)

2. (A)-(I). (B)-(III). (C)-(II). (D)-(IV)

3. (A)-(I). (B)-(II). (C)-(IV), (D)-(III)

4. (A)-(III). (B)-(IV). (C)-(I). (D)-(II)

EXPLANATION:

- Valine (Val) is an example of an aliphatic amino acid.
- Cysteine (Cys) is a sulfur-containing amino acid.
- Proline (Pro) is classified as an imino acid.
- Glutamine (Gln) is an amide.

Q.35 Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R). **[CUET PG 2024]**

Assertion (A): Male sterility in angiosperms can be induced by inserting abacterial gene called BARNASE

Reason (R): BARNASE causes premature breakdown of tapetum resulting inarrest of microspore development

In light of the above statements, choose the correct answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A).

2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A).

3. (A) is true but (R) is false.

4. (A) is false but (R) is true.

EXPLANATION: Assertion (A) is true: Male sterility in plants can be induced by the barnase gene, which encodes a ribonuclease. Reason (R) is also true and explains why (A) is true: barnase expression in the tapetum leads to its premature breakdown, thus inhibiting microspore development and resulting in male sterility.

Q.36 Inverted ovules are called as **[CUET PG 2024]**

1. Orthotropus

2. Anatropus

3. Amphitropus

4. Hemianatropus

EXPLANATION: Anatropus refers to inverted ovules, where the ovule is completely turned back 180 degrees so that the micropyle faces the placenta. This inversion helps facilitate pollen tube entry during fertilization.

Q.37 Which of the following cell organelle is regarded as semi-autonomous? **[CUET PG 2024]**

1. Chloroplast

2. Peroxisomes

3. Ribosomes

4. Lysosome

EXPLANATION: Chloroplasts are regarded as semi-autonomous organelles because they contain their own DNA and ribosomes, allowing them to replicate independently of the cell nucleus and synthesize some of their proteins.

Q.38 The causal agent of Byssinosis is: **[CUET PG 2024]**

1. Pollen dust

2. Arsenic

3. Cotton dust

4. Iron dust

EXPLANATION: Byssinosis, also known as "brown lung disease," is primarily caused by exposure to cotton dust in inadequately ventilated environments, typically in textile factories.

Q.39 Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R). **[CUET PG 2024]**

Assertion (A): Penetrance and Expressivity are term which can be used interchangeably

Reason (R): Expressivity is the degree to which a genotype is expressed as a

phenotype within an individual, while penetrance refers to the percentage of

individuals with a particular genotype who express the associated phenotype.

In light of the above statements, choose the most appropriate answer from the

options given below.

1. Both (A) and (R) are correct and (R) is the correct explanation of (A).

2. Both (A) and (R) are correct but (R) is NOT the correct explanation of (A).

3. (A) is correct but (R) is not correct.

4. (A) is not correct but (R) is correct.

EXPLANATION: Assertion (A) is incorrect as penetrance and expressivity are not interchangeable; they refer to different genetic concepts. Reason (R) is correct, providing the definitions of expressivity and penetrance, which show the distinct meaning of each term.

Q.40 Malacophyllous leaves are found in **[CUET PG 2024]**

1. submerged hydrophytes

2. xerophytes

3. amphibious plants

4. free floating hydrophytes

EXPLANATION: Malacophyllous leaves are characteristic of xerophytes, which are plants adapted to arid environments with limited water availability. These leaves often feature thickened cuticles, reduced surface area, and sometimes succulence to minimize water loss through transpiration and to withstand drought conditions. They help xerophytes survive and thrive in their challenging habitats.

Q.41 The important character of the family Asteraceae is **[CUET PG 2024]**

(A). Inflorescence is a racemose head or capitulum

(B). Presence of cypsela fruit

(C). Presence of gynostegium

(D). Placentation is free central

Choose the correct answer from the options given below:

1. (A) and (B) only.

2. (A), (B) and (C) only.

3. (A), (B). (C) and (D).

4. (B). (C) and (D) only.

EXPLANATION: In the family Asteraceae, the inflorescence is typically a racemose head or capitulum (A), and the fruit formed is a cypsela (B). The presence of gynostegium (C) is characteristic of the Apocynaceae family, not Asteraceae. Placentation being free central (D) is also not a characteristic of Asteraceae.

Q.42 The most effective sugar in promoting pollen germination is **[CUET PG 2024]**

1. Glucose

2. Fructose

3. Sucrose

4. Maltose

EXPLANATION: Sucrose is the most effective sugar for promoting pollen germination. It provides both energy and serves as a nutrient source, aiding in the growth of the pollen tube.

Q.43 The important characteristic of k-selected population is **[CUET PG 2024]**

(A). convex survivorship curve

(B). low fecundity

(C). exist close to their carrying capacity

(D). intraspecific competition

Choose the correct answer from the options given below:

1. (A). (B) and (D) only.

2. (A), (B) and (C) only.

3. (A). (B), (C) and (D).

4. (B). (C) and (D) only.

EXPLANATION: K-selected populations are characterized by traits that optimize survival under stable environmental conditions close to their carrying capacity , including low fecundity and significant intraspecific competition . The survivorship curve for K-selected species is typically convex (Type I), showing high survival at young ages.

Q.44 Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R). [CUET PG 2024]

Assertion (A): The application of transgenic plants is in the delayed ripening.

production of bioplastic, plant as a bioreactor for the production of antibodies, etc.

Reason (R): Agrobacteria that carries a recombinant plasmid with both as electable marker and a desired transgene are used to make plant transgenic.

In light of the above statements, choose the correct answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A).

2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A).

3. (A) is true but (R) is false.

4. (A) is false but (R) is true.

EXPLANATION: Assertion (A) is true as transgenic plants have applications in areas like delayed ripening and production of pharmaceuticals. Reason (R) is also true because Agrobacteria are often used to introduce recombinant DNA into plants, making them transgenic that (R) is the correct explanation of (A).

Q.45 Which of the following algae are used as bio-fertilizers? [CUET PG 2024]

1. Spirogyra, Gloiopeltis, Ulothrix

2. Ulothrix, Chara and Anabaena

3. Anabaena, Azolla, Nostoc

4. Nostoc, Volvox, Anabaena

EXPLANATION: *Anabaena, Azolla, and Nostoc are algae commonly used as bio-fertilizers. They are effective due to their ability to fix atmospheric nitrogen, enriching soil fertility and promoting healthier plant growth.*

Q.46 Match List I with List II **[CUET PG 2024]**

LIST I Terms	**LIST II Example**
A. Halophile	I. Thermus aquaticus
B. Acidophile	II. Treponema
C. Thermophile	III. Halobacterium
D. Microaerophile	IV. Sulfolobus

Choose the correct answer from the options given below:

1. (A)-(I). (B)-(II), (C)-(III), (D)-(IV)

2. (A)-(I). (B)-(III). (C)-(II). (D)-(IV)

3. (A)-(I). (B)-(II). (C)-(IV), (D)-(III)

4. (A)-(III). (B)-(IV). (C)-(I), (D)-(II)

EXPLANATION: A. Halophiles are organisms that thrive in high salt concentrations, like Halobacterium (III).B. Acidophiles are organisms that thrive in acidic environments, such as Sulfolobus (IV).C. Thermophiles are organisms that thrive at high temperatures, like Thermus aquaticus (I).D. Microaerophiles are organisms that require lower levels of oxygen than that in the atmosphere, such as Treponema (II).

Q.47 Given below are two statements, one is labelled as Assertion (A) and other onelabelled as Reason (R). **[CUET PG 2024]**

Assertion (A): Root apical cell theory of Nageli does not hold good for flowering plants

Reason (R): In flowering plants, a group of initials has been observed

In light of the above statements, choose the correct answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A).

2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A).

3. (A) is true but (R) is false.

4. (A) is false but (R) is true.

EXPLANATION: Assertion (A) is true because Root Apical Cell Theory of Nageli, which posits a single apical cell as the source of all root cells, does not apply to flowering plants where a group of initial cells are observed (R). Reason (R) correctly explains why the theory does not hold as flowering plants demonstrate a group of initials, contradicting the theory's single-cell assertion.

Q.48 Lignin **[CUET PG 2024]**

(A). is a polysaccharide

(B). is second most abundant organic compound

(C). is a polymer of aromatic alcohols

(D). synthetic pathway is peroxidase dependent

Choose the correct answer from the options given below:

1. (A), (B) and (D) only.

2. (A), (B) and (C) only.

3. (A). (B). (C) and (D).

4. (B). (C) and (D) only.

EXPLANATION: Lignin is not a polysaccharide; it is a complex polymer made up of aromatic alcohols .It is indeed the second most abundant organic compound on Earth after cellulose .Its synthetic pathway involves peroxidases that help cross-link lignin monomers .

Q.49 Myoglobin is a globular protein, which is made up of amino acids.[CUET PG 2024]

1. 159

2. 153

3. 160

4. 170

EXPLANATION: Myoglobin is a globular protein that contains 153 amino acids. It serves as an oxygen storage protein in muscle cells, aiding in oxygen delivery particularly under low oxygen conditions.

Q.50 The amount of DNA present in the genome of a species is called as [CUET PG 2024]

1. D-value

2. C-value

3. B-value

4. T-value

EXPLANATION: The term "C-value" refers to the amount of DNA in the haploid genome of a species. The C-value provides a measure of the total amount of DNA contained within a single set of chromosomes in a cell.

Q.51 Which of the following is not an identifying feature of Cycas [CUET PG 2024]

1. Antherozoids are motile

2. Anatomical features of the leaflet indicating it as a mesophyte

3. Circinate venation of the foliage leaves

4. Xylem lacking vessels

EXPLANATION: Cycas plants are known for their circinate venation in foliage leaves and for having xylem that lacks vessels, both of which are primitive features. However, they do not have leaflets with anatomical features indicating they are mesophytes; instead, their leaflets are more adapted to arid conditions. Thus, the statement about mesophytic leaflet features is incorrect.

Q.52 Which disease is a severe form of protein-energy malnutrition which results when a person does not consume enough protein and calories? [CUET PG 2024]

1. Lathyrism

2. Marasmus

3. Favism

4. Night blindness

EXPLANATION: Marasmus is a severe form of protein-energy malnutrition that occurs when an individual's diet lacks adequate protein and calories. It is characterized by significant muscle and fat loss and stunted growth, primarily affecting infants and young children.

Q.53 N-acetylglucosamine (NAG) and N-acetylmuramic acid (NAM) in cell wall of bacteria are connected by: [CUET PG 2024]

1. B-1,4 glycosidic bond

2. B-1.2 glycosidic bond

3. B-1,3 glycosidic bond

4. B-2,4 glycosidic bond

EXPLANATION: In the bacterial cell wall, N-acetylglucosamine (NAG) and N-acetylmuramic acid (NAM) are connected by β-1,4-glycosidic bonds. This bond formation is crucial for the structural integrity of peptidoglycan, which is a major component of the bacterial cell wall.

Q.54 Match List I with List II [CUET PG 2024]

LIST I (Processes)	LIST II (Scientists)
A. Intra ovarian pollination	I. L. Haberlandt
B. Double fertilization	II. E. Strasburger
C. Syngamy	III. S Nawaschin
D. Necrohormone theory	IV. Kanta

Choose the correct answer from the options given below:

1. (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

2. (A)-(I). (B)-(III). (C)-(II). (D)-(IV)

3. (A)-(I). (B)-(II). (C)-(IV), (D)-(III)

4. (A)-(IV), (B)-(III). (C)-(II), (D)-(I)

EXPLANATION: Intraovarian pollination was studied by Kanta (IV), relating to pollination occurring within the ovary.Double fertilization, the discovery that one sperm fertilizes the egg and another fertilizes the polar nuclei, was elucidated by Sergius Nawaschin (III).Syngamy, or the fusion of two gametes, was extensively studied by Eduard Strasburger (II).The necrohormone theory, which relates to substances influencing cell death and decay, was proposed by L. Haberlandt (I).

Q.55 Which amino acid(s) contain/s the amino group (-NH2) attached as a side chain.

[CUET PG 2024]

1. Lys

2. Arg

3. Asn

4. Lys and Arg

EXPLANATION: Lysine and arginine are the two amino acids where the amino group (-NH2) is attached directly as a part of their side chain. Both amino acids play significant roles in protein structure and metabolism.

Q.56 The anamalous distribution of vascular tissues in older stem of Bougainvillea is due to

[CUET PG 2024]

(A). formation of accessory cambial rings

(B). formation of interxylary phloem

(C). abnormal behaviour of normal cambium

(D). abnormal behaviour of abnormal cambium

Choose the correct answer from the options given below:

1. (A) only.

2. (A), (B) and (C) only.

3. (A), (B). (C) and (D).

4. (B). (C) and (D) only.

EXPLANATION: The anomalous distribution of vascular tissues in older stems of Bougainvillea is primarily due to the formation of accessory cambial rings, which can contribute to additional cambial activity that alters the normal pattern of vascular tissue distribution. The other options relate to

other potential vascular anomalies but are not specifically noted for Bougainvillea in typical botanical descriptions.

Q.57 Which of the following technique is used to inactivate a gene by altering the DNA

[CUET PG 2024]

1. Homologous recombination

2. Antisense nucleic acid block

3. Antibody microinjection

4. Introduction of dominant inhibitory mutant

EXPLANATION: Homologous recombination is a genetic technique used to inactivate a gene by altering the DNA sequence. This method can specifically target a gene to disrupt its function, allowing researchers to study the gene's role in an organism.

Q.58 Match List I with List II **[CUET PG 2024]**

LIST I Plants source	**LIST II**
A. *Allium sativa*	I. Anticarcinogenic
B. *Coptis japonica*	II. Cardiac medicine
C. *Taxus baccata*	III. Insecticidal
D. *Digitalis lanata*	IV. Antibacterial

Choose the correct answer from the options given below:

1. (A)-(I). (B)-(II), (C)-(III), (D)-(IV)

2. (A)-(I). (B)-(III). (C)-(II). (D)-(IV)

3. (A)-(III). (B)-(IV). (C)-(I), (D)-(II)

4. (A)-(I). (B)-(IV), (C)-(III), (D)-(II)

EXPLANATION:

- *Allium sativa* (garlic) has insecticidal properties (III), useful in controlling pests.
- *Coptis* japonica is known for its antibacterial properties (IV), beneficial in medical applications.
- *Taxus baccata* (yew) contains taxol, an anticarcinogenic compound used in cancer treatment (I).
- *Digitalis lanata* is used in cardiac medicine due to its compounds like digitoxin (II).
-

Q.59 Match List I with List II **[CUET PG 2024]**

LIST I	**LIST II**
A. Penicillin	*I. Aspergillus niger*
B. Fermentation of sucrose and mollasses to	*II. Phytophthora infestans*

produce citric acid	
C. Fermentation of carbohydrates to produce ethyl alcohol and CO_2	*III. Penicillium notatum*
D. Irish potato famine	*IV. Saccharomycescerevisiae*

Choose the correct answer from the options given below:

1. (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

2. (A)-(III). (B)-(I). (C)-(II), (D)-(IV)

3. (A)-(III), (B)-(I). (C)-(IV), (D)-(II)

4. (A)-(III). (B)-(IV), (C)-(I). (D)-(II)

EXPLANATION:

- Penicillin is produced by Penicillium notatum (III).
- The fermentation of sucrose and molasses to produce citric acid is done by Aspergillus niger (I).
- The fermentation of carbohydrates to produce ethyl alcohol and CO_2 is performed by Saccharomyces cerevisiae (IV).
- The Irish potato famine was caused by Phytophthora infestans (II).

Q.60 The different methods to overcome self-incompatibility are [CUET PG 2024]

(A). mixed pollination

(B). bud pollination

(C). stub pollination

(D). intra-ovarian pollination

Choose the correct answer from the options given below:

1. (A), (B) and (D) only.

2. (A). (B) and (C) only.

3. (A), (B), (C) and (D).

4. (B). (C) and (D) only.

EXPLANATION: Mixed pollination involves using pollen from multiple donors to overcome self-incompatibility.Bud pollination entails pollinating flowers before they fully open, which can sometimes circumvent self-incompatibility mechanisms.Stub pollination is a technique where part of the flower's style is removed before pollination to facilitate the acceptance of pollen.Intra-ovarian pollination involves placing pollen directly into the ovary, bypassing external incompatibility barriers.

Q.61 During the germination of cereal seeds, what is the role of a-amylase present in the aleuron layer? [CUET PG 2024]

1. It directly gets converted into sugars

2. It is a reserve food material

3. It hydrolyzes the endosperm starch into sugars, which provide the energy for the growth of root sand shoots

4. It is responsible for seed dormancy

EXPLANATION: During the germination of cereal seeds, α-amylase produced in the aleurone layer plays a crucial role in breaking down starch stored in the endosperm into sugars. These sugars then provide the necessary energy for the growth of roots and shoots in the germinating seed.

Q.62 Calculate the degree of freedom, if the given data set represents a dihybrid cross?

[CUET PG 2024]

1.3

2.2

3.4

4.5

EXPLANATION: In a dihybrid cross, the degree of freedom for a chi-square test is calculated as the number of phenotypic categories minus one. For a dihybrid cross (two genes, each with two alleles), there are four phenotypic categories (9:3:3:1 ratio). Thus, the degree of freedom is 4 - 1 = 3.

Q.63 Which of the following is/are prophylactic (preventive) methods of plant disease control

[CUET PG 2024]

(A). Eradication of alternate host

(B). Spraying plants with pesticides and fungicides on a regular basis

(C). Crop rotation practices to control soil borne diseases

(D). Growing antagonistic plants

Choose the correct answer from the options given below:

1. (A) and (D) only.

2. (A) and (C) only.

3. (A), (B), (C) and (D).

4. (B) and (D) only.

EXPLANATION: Eradicating alternate hosts breaks the life cycle of many pathogens, preventing the spread of disease, making it a proactive disease management strategy.Crop rotation disrupts the habitat for soil-borne pathogens by alternating the types of crops planted, thereby reducing disease incidence without the use of chemicals.While regular spraying of pesticides and fungicides and

growing antagonistic plants are also disease control methods, they are more reactive or supplemental in nature rather than strictly prophylactic.

Q.64 Which is not a transmembrane protein? **[CUET PG 2024]**

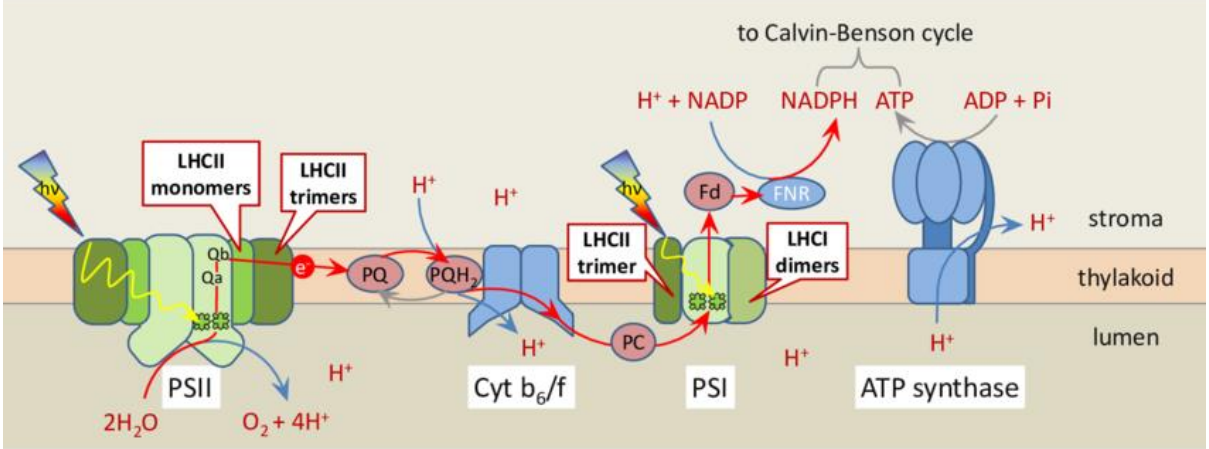
1. ATP synthase

2. LHC

3. PS II

4. Ferredoxin

EXPLANATION: Ferredoxin is not a transmembrane protein; it is a soluble protein that shuttles electrons in chloroplasts and does not span the membrane. ATP synthase, LHC (light-harvesting complexes), and PS II (Photosystem II) are all integral membrane proteins involved in the photosynthetic process.



Q.65 Match List I with List II **[CUET PG 2024]**

LIST I(Taxonomic characters)	LIST II(Families)
A. Jaculators	I. Apiaceae
B. Caryopsis fruits	II. Euphorbiaceae
C. Cyathium	III. Poaceae
D. Cremocarp fruit	IV. Acanthaceae

Choose the correct answer from the options given below:

1. (A)-(IV), (B)-(III), (C)-(II), (D)-(I)

2. (A)-(I), (B)-(III). (C)-(II). (D)-(IV)

3. (A)-(I). (B)-(II). (C)-(IV). (D)-(III)

4. (A)-(III). (B)-(IV). (C)-(I). (D)-(II)

EXPLANATION:

- Jaculators are characteristic features of Acanthaceae (IV), used for seed dispersal.
- Caryopsis fruits are typical of Poaceae (III), being a dry fruit where the seed is fused with the fruit wall.
- Cyathium, a specialized inflorescence, is a defining feature of Euphorbiaceae (II).
- Cremocarp fruit is characteristic of Apiaceae (I), often seen in plants like carrots and celery.

Q.66 Pseudoelators, which help in the dispersal of spores, are present in [CUET PG 2024]

1. Psilotum

2. Marchantia

3. Riccia

4. Anthoceros

EXPLANATION: Pseudoelaters are present in **Anthoceros**, which is a genus of hornworts. These structures are not true elaters but function similarly by assisting in the dispersal of spores.

Q.67 *Agrobacterium rhizogenes* is used to genetically engineer the plant because of the following statement [CUET PG 2024]

1. It contains a Ti plamid

2. It causes gene transfer to plants

3. It infects all types of plants

4. Infects plants and produce a good root system

EXPLANATION: Agrobacterium rhizogenes is used in genetic engineering primarily because it infects plants and induces the formation of hairy roots due to its root-inducing (Ri) plasmid, not a Ti plasmid, which is characteristic of **Agrobacterium tumefaciens**. This property is exploited to create transgenic plants with enhanced root systems, useful in both research and agriculture.

Q.68 Reserpine is obtained from the roots? [CUET PG 2024]

1. Rauwolfia serpentina

2. Datura innoxia

3. Withania somnifera

4. Digitalis purpurea

EXPLANATION: Reserpine, a drug used for its tranquilizing effects and to manage high blood pressure, is obtained from the roots of **Rauwolfia serpentina**. This plant has been used in traditional medicine for centuries and is known for its potent bioactive compounds.

Q.69 Which of the following is correct statement about ATP [CUET PG 2024]

A. It contains two phosphodiester bonds

B. It has one phosphate ester bond

C. It contains ribose sugar

D. It contains adenosine as nucleoside

Choose the correct answer from the options given below:

1. (A)-(I), (B)-(II), (C)-(III), (D-(IV)

2. (A)-(I). (B)-(III). (C)-(II). (D)-(IV)

3. (A)-(I). (B)-(II). (C)-(IV), (D)-(III)

4. (A)-(III). (B)-(IV). (C)-(I), (D)-(II) DROP

EXPLANATION: This question is drop from main question paper.

Q.70 Free central placentation is present in the family of **[CUET PG 2024]**

1. Brassicaceae

2. Cucurbitaceae

3. Caryophyllaceae

4. Capparaceae

EXPLANATION: Free central placentation, where ovules are attached to a central column in an ovary without septa, is a characteristic of the family **Caryophyllaceae**. This placentation type is typical in flowers where the ovary is one-chambered with a free-standing central placenta.

Q.71 What are the basic properties of Gram positive (+ve) bacteria **[CUET PG 2024]**

(A). Thick peptidoglycan layer is present

(B). Teichoic acids are present

(C). Periplasmic space is negligible

(D). Outer membrane is present

Choose the correct answer from the options given below:

1. (A), (B) and (D) only.

2. (A), (B) and (C) only.

3. (A), (B), (C) and (D).

4. (B). (C) and (D) only.

EXPLANATION: Gram-positive bacteria are characterized by a thick peptidoglycan layer which retains the crystal violet stain used in Gram staining. They also contain teichoic acids, which are embedded

in or linked to their cell wall. The periplasmic space in Gram-positive bacteria is negligible due to the absence of an outer membrane, unlike Gram-negative bacteria. They do not have an outer membrane (D is false).

Q.72 The transfer of DNA from one bacterial strain to another by a virus and the subsequent recombination between the chromosomes of the recepient cells and the introduced DNA is called as: **[CUET PG 2024]**

1. Transformation

2. Transduction

3. Conjugation

4. Recombination

EXPLANATION: Transduction is the process where DNA is transferred from one bacterial cell to another by a virus (bacteriophage). The bacteriophage carries genetic material from a donor bacterium and delivers it to a recipient bacterium, where it can recombine with the host genome.

Q.73 The enzyme which converts citrate to isocitrate in TCA cycle is: **[CUET PG 2024]**

1. Aconitase

2. Isocitrate dehydrogenase

3. Fumarase

4. Trans ketolase

EXPLANATION:

Q.74 Which of the following is the most common form of a DNA? **[CUET PG 2024]**

1. Z-DNA

2. A-DNA

3. B-DNA

4. C-DNA

EXPLANATION: The most common form of DNA under physiological conditions is B-DNA. It is the right-handed helical structure of DNA that forms under aqueous, biological conditions and is characterized by a wide major groove and narrow minor groove.

Q.75 Match List I with List II **[CUET PG 2024]**

LIST I (Stomata type)	**LIST II (Family)**
A. Anomocytic	I. Acanthaceae

B. Anisocytic	II. Magnoliaceae
C. Paracytic	III. Apiaceae
D. Diacytic	IV. Papaveraceae

Choose the correct answer from the options given below:

1. (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

2. (A)-(I), (B)-(III), (C)-(II). (D)-(IV)

3. (A)-(I), (B)-(II). (C)-(IV), (D)-(III)

4. (A)-(IV), (B)-(III). (C)-(II). (D)-(I)

EXPLANATION: Anomocytic stomata, which lack subsidiary cells, are characteristic of the Papaveraceae family. Anisocytic stomata, which feature three subsidiary cells with one smaller than the others, are typical for the Apiaceae family. Paracytic stomata, distinguished by two parallel subsidiary cells flanking the guard cells, are found in the Magnoliaceae family. Diacytic stomata, defined by their two subsidiary cells at right angles to the pore, are seen in the Acanthaceae family.