CUET-UG Agriculture Sample Paper-16

Duration: 1 Hour **Maximum Marks: 250**

Instructions

- This paper contains a total of 50 Multiple Choice Questions.
- Each correct answer carries **+5 marks**.
- Each incorrect answer carries **-1 mark**.
- No negative marking for unattempted questions.

Q1. In a cross between two heterozygous individuals (AaBb × AaBb), where genes are completely linked and no crossing over occurs, what will be the expected phenotypic ratio in the offspring?

(A) 9:3:3:1

(B) 3:1

(C) 1:1

(D) Only parental phenotypes

Q2. Which stage of meiosis is primarily responsible for generating genetic recombination due to crossing over between homologous chromosomes?

(A) Metaphase I

(B) Prophase I

(C) Anaphase II

(D) Telophase I

Q3. In plant breeding, heterosis or hybrid vigor is best explained as:

(A) Loss of genetic variation

(B) Superiority of F_1 over parents

(C) Increase in homozygosity

(D) Mutation accumulation

Q4. Which enzyme unwinds the DNA double helix during replication by breaking hydrogen bonds between base pairs?

(A) Ligase

(B) Helicase

(C) Polymerase

(D) Topoisomerase

Q5. Mutation breeding is mainly used to achieve which of the following objectives in crop improvement?

(A) Eliminate variation

(B) Introduce new genetic variability

(C) Maintain purity

(D) Reduce yield

Q6. Which of the following macromolecules primarily acts as a catalyst in biochemical reactions within living cells?

(A) Carbohydrates

(B) Lipids

(C) Proteins

(D) Nucleic acids

Q7. The process by which atmospheric nitrogen is converted into nitrates usable by plants is known as:

(A) Denitrification

(B) Ammonification

(C) Nitrification

(D) Nitrogen fixation

Q8. Which weather element is most directly responsible for determining the length of the growing season of crops?

(A) Humidity

(B) Temperature

(C) Wind velocity

(D) Rainfall variability

Q9. The term "latent heat of vaporization" in agrometeorology is most closely associated with which process?

(A) Soil formation

(B) Evapotranspiration

(C) Photosynthesis

(D) Respiration

Q10. Which of the following livestock breeds is primarily used for dual purposes (milk and draught)?

(A) Sahiwal

(B) Gir

(C) Ongole

(D) Jersey

Q11. The incubation period of Ranikhet disease in poultry is influenced mainly by:

(A) Feed quality

(B) Environmental temperature

(C) Viral strain virulence

(D) Housing type

Q12. In dairy management, lactation period refers to:

(A) Time between two pregnancies

(B) Duration of milk secretion

(C) Age at first calving

(D) Time taken for digestion

Q13. Which mineral deficiency in livestock leads to milk fever in high-yielding cows?

(A) Iron

(B) Calcium

(C) Phosphorus

(D) Sodium

Q14. The main objective of deworming livestock is to:

(A) Increase feed intake

(B) Eliminate internal parasites

(C) Improve milk taste

(D) Reduce body temperature

Q15. Black cotton soil is characterized by which of the following properties?

(A) Sandy texture

(B) High water retention and swelling nature

(C) Low fertility

(D) High permeability

Q16. Leaching of nutrients in soil is most likely to occur under which condition?

(A) Low rainfall

(B) High evaporation

(C) Heavy rainfall

(D) Strong winds

Q17. The term "wilting point" of soil refers to:

(A) Maximum water content

(B) Minimum water at which plants wilt irreversibly

(C) Soil saturation

(D) Water logging condition

Q18. Which irrigation method is most suitable for uneven land topography?

(A) Basin irrigation

(B) Sprinkler irrigation

(C) Flood irrigation

(D) Furrow irrigation

Q19. Herbicides that kill only specific types of weeds without affecting crops are known as:

(A) Non-selective herbicides

(B) Selective herbicides

(C) Contact herbicides

(D) Residual herbicides

Q20. Which cropping system involves growing two or more crops simultaneously on the same field?

(A) Crop rotation

(B) Intercropping

(C) Monocropping

(D) Relay cropping

Q21. Zero tillage farming is mainly adopted to reduce:

(A) Soil fertility

(B) Soil erosion

(C) Crop yield

(D) Water availability

Q22. Green revolution in India was primarily associated with increased production of:

(A) Pulses

(B) Oilseeds

(C) Wheat and rice

(D) Fruits and vegetables

Q23. In organic farming, which input is commonly used to improve soil fertility naturally?

(A) Chemical fertilizers

(B) Farmyard manure

(C) Synthetic pesticides

(D) Growth regulators

Q24. Which fruit crop is most sensitive to frost conditions during flowering stage?

(A) Mango

(B) Banana

(C) Citrus

(D) Apple

Q25. Layering as a method of vegetative propagation is most commonly used in which type of plants?

(A) Herbaceous plants

(B) Woody shrubs

(C) Annual crops

(D) Aquatic plants

Q26. In a population under Hardy–Weinberg equilibrium, if the frequency of recessive allele is 0.2, what will be the frequency of heterozygous individuals?

(A) 0.16

(B) 0.32

(C) 0.48

(D) 0.64

Q27. Which mechanism is responsible for maintaining genetic variation in a population despite selection pressure?

(A) Genetic drift

(B) Mutation

(C) Inbreeding

(D) Stabilizing selection

Q28. During transcription, the template strand of DNA is read in which direction by RNA polymerase?

(A) 5' $\rightarrow$ 3'

(B) 3' $\rightarrow$ 5'

(C) Both directions

(D) Random direction

Q29. Which of the following techniques is used for rapid multiplication of disease-free plants under controlled conditions?

(A) Hybridization

(B) Micropropagation

(C) Mutation breeding

(D) Backcrossing

Q30. Which class of enzymes catalyzes oxidation-reduction reactions in biological systems?

(A) Hydrolases

(B) Transferases

(C) Oxidoreductases

(D) Lyases

Q31. Which group of microorganisms converts ammonia into nitrites in the soil nitrogen cycle?

(A) Nitrobacter

(B) Nitrosomonas

(C) Rhizobium

(D) Azotobacter

Q32. Which meteorological instrument is used to measure wind speed in agricultural fields?

(A) Hygrometer

(B) Anemometer

(C) Barometer

(D) Thermometer

Q33. Which climatic condition is most favorable for the spread of fungal diseases in crops?

(A) Low humidity and high temperature

(B) High humidity and moderate temperature

(C) Low humidity and low temperature

(D) High wind velocity

Q34. Which of the following Indian cattle breeds is primarily known for high milk fat content rather than quantity?

(A) Holstein Friesian

(B) Jersey

(C) Gir

(D) Brown Swiss

Q35. Which disease in cattle is characterized by high fever, nasal discharge, and severe diarrhea leading to high mortality?

(A) FMD

(B) Rinderpest

(C) Mastitis

(D) Anthrax

Q36. Dry matter intake in livestock nutrition primarily depends on which factor?

(A) Animal body weight

(B) Color of feed

(C) Type of housing

(D) Season only

Q37. Which vitamin deficiency in poultry leads to curled-toe paralysis?

(A) Vitamin A

(B) Vitamin B_1

(C) Vitamin B_2

(D) Vitamin D

Q38. Which soil horizon is richest in organic matter and microbial activity?

(A) O-horizon

(B) A-horizon

(C) B-horizon

(D) C-horizon

Q39. Cation exchange capacity (CEC) of soil is mainly influenced by:

(A) Soil color

(B) Clay and organic matter content

(C) Soil temperature

(D) Crop type

Q40. Which nutrient is most responsible for root development and early plant growth?

(A) Nitrogen

(B) Phosphorus

(C) Potassium

(D) Sulfur

Q41. The term "duty of water" in irrigation refers to:

(A) Amount of water required per crop

(B) Area irrigated per unit discharge of water

(C) Frequency of irrigation

(D) Loss of water during irrigation

Q42. Which type of weed control method involves the use of natural predators or biological agents?

(A) Mechanical control

(B) Chemical control

(C) Biological control

(D) Cultural control

Q43. Which cropping practice involves growing a second crop before the first crop is harvested?

(A) Intercropping

(B) Relay cropping

(C) Mixed cropping

(D) Crop rotation

Q44. Which modern agricultural technique uses GPS technology for site-specific crop management?

(A) Organic farming

(B) Precision farming

(C) Subsistence farming

(D) Shifting cultivation

Q45. Which plant growth regulator is primarily responsible for cell elongation and stem growth?

(A) Auxin

(B) Cytokinin

(C) Ethylene

(D) Abscisic acid

Q46. Which fruit is classified as a climacteric fruit and continues to ripen after harvesting?

(A) Citrus

(B) Grape

(C) Mango

(D) Pineapple

Q47. Which propagation method involves bending a branch to the ground and covering it with soil to induce rooting?

(A) Grafting

(B) Cutting

(C) Layering

(D) Budding

Q48. Which factor is most critical for gel formation in jelly preparation?

(A) Protein content

(B) Pectin concentration

(C) Fat content

(D) Mineral content

Q49. Controlled atmosphere storage of fruits primarily aims to regulate which factor?

(A) Soil nutrients

(B) Gas composition around produce

(C) Water content of soil

(D) Sunlight exposure

Q50. Which horticultural practice involves removal of unwanted branches to improve plant growth and yield?

(A) Mulching

(B) Pruning

(C) Irrigation

(D) Fertigation

Detailed Solutions

Q1.

Solution

Concept: Gene Linkage and Dihybrid Cross.

Solution: In a dihybrid cross where genes are completely linked, they are inherited together as a single unit, and no crossing over occurs. This means a heterozygous parent (AaBb) will not produce recombinant gametes (Ab, aB).

Let's assume the parental genotype AaBb was formed from a cross of AABB × aabb (cis or coupling phase). In this case, the alleles A and B are on one chromosome, and a and b are on the homologous chromosome.

- The only gametes produced by such a parent are (AB) and (ab).
- The cross is AaBb × AaBb. So, the gametes from both parents are (AB) and (ab).
- Using a Punnett square:

	AB	ab
AB	AABB	AaBb
ab	AaBb	aabb

- The resulting genotypic ratio is 1 AABB : 2 AaBb : 1 aabb.
- Assuming complete dominance, the phenotypes are:
  - AABB $\rightarrow\rightarrow$ Dominant for both traits (A_B_)
  - AaBb $\rightarrow\rightarrow$ Dominant for both traits (A_B_)
  - aabb $\rightarrow\rightarrow$ Recessive for both traits (aabb)
- The phenotypic ratio is (1+2) : 1, which is 3 (Dominant/Dominant) : 1 (Recessive/Recessive). This is the same ratio as a standard monohybrid cross because the two linked genes behave as one.

Final Answer : "3:1"

Answer: (B)

Q2.

Solution

Concept: Stages of Meiosis.

Solution: Meiosis is a specialized type of cell division that reduces the chromosome number by half, creating four haploid cells, each genetically distinct from the parent cell and from each other. Genetic recombination is a key feature of meiosis that generates this diversity.

- The primary mechanism for genetic recombination is crossing over, which is the exchange of genetic material between non-sister chromatids of homologous chromosomes.
- This critical event occurs during Prophase I of meiosis. Prophase I is a complex stage divided into five sub-stages: leptotene, zygotene, pachytene, diplotene, and diakinesis.
- Homologous chromosomes pair up (synapsis) during zygotene, and the actual physical exchange of DNA segments (crossing over) happens during the pachytene sub-stage.
- The other stages listed have different functions: Metaphase I is for alignment of homologous pairs, Anaphase II is for separation of sister chromatids, and Telophase I is for the formation of two haploid cells.

Final Answer : "Prophase I"

Answer: (B)

Q3.

Solution

Concept: Principles of Plant Breeding.

Solution: Heterosis, also known as hybrid vigor, is a fundamental concept in genetics and breeding. It is the phenomenon where the offspring (F generation) of a cross between two genetically different parents show enhanced characteristics or performance compared to both parents.

- This "superiority" can manifest in various ways, such as increased yield, faster growth rate, greater size, improved fertility, or better resistance to diseases and stress.
- The genetic basis for heterosis is complex but is generally attributed to the masking of deleterious recessive alleles from one parent by dominant alleles from the other, and the combination of favorable alleles from both parents.
- For example, if parent 1 has genotype AAbbCC (good trait A, bad trait b) and parent 2 has genotype aaBBcc (bad trait a, good trait B), the F hybrid AaBbCc combines the superior traits from both parents, resulting in overall superiority.

Final Answer : "Superiority of F over parents"

Answer: (B)

Q4.

Solution

Concept: Enzymes in DNA Replication.

Solution: DNA replication is a complex process involving several key enzymes that work in a coordinated manner to duplicate the DNA molecule.

- The process begins with the unwinding of the DNA double helix. The enzyme responsible for this task is Helicase.
- Helicase moves along the DNA strand and breaks the hydrogen bonds between the complementary base pairs (A-T and G-C), separating the two strands and creating a replication fork where replication can begin.
- The other enzymes listed have different roles:
  - **Ligase:** Joins DNA fragments (like Okazaki fragments on the lagging strand) together.
  - **Polymerase:** Synthesizes the new DNA strands by adding nucleotides complementary to the template strands.
  - **Topoisomerase:** Relieves the torsional stress and supercoiling that builds up ahead of the replication fork as the DNA is unwound.

Final Answer : "Helicase"

Answer: (B)

Q5.

Solution

Concept: Methods of Crop Improvement.

Solution: Mutation breeding is a technique used by plant breeders to generate new traits in crops. It involves inducing mutations using mutagens, which are agents like radiation (X-rays, gamma rays) or chemicals (e.g., EMS).

- The fundamental purpose of any breeding program is to work with genetic variation. Sometimes, the desired traits (like resistance to a new disease or tolerance to a specific stress) may not exist in the available gene pool of a crop species.
- Mutation breeding is used to introduce new genetic variability by creating random changes (mutations) in the plant's DNA.
- These mutations can lead to new alleles and, consequently, new traits. The breeder then screens the large population of mutated plants to identify and select individuals that exhibit the desired novel trait for use in further breeding.

Final Answer : "Introduce new genetic variability"

Answer: (B)

Q6.

Solution

Concept: Functions of Biological Macromolecules.

Solution: Catalysts are substances that speed up chemical reactions without being consumed in the process. In living organisms, these biological catalysts are called enzymes.

- The vast majority of enzymes are proteins. Proteins are polymers of amino acids that fold into specific three-dimensional structures. This unique structure creates an "active site" that is complementary to the shape of the reactant molecules (substrates). By binding to the substrates, the enzyme facilitates the chemical reaction, dramatically increasing its rate.
- While some RNA molecules (called ribozymes) can also act as catalysts, proteins are the primary class of macromolecules responsible for catalysis in biochemical reactions.
- Carbohydrates and lipids primarily function in energy storage and structure, while nucleic acids (DNA and RNA) are mainly involved in storing and transmitting genetic information.

Final Answer : "Proteins"

Answer: (C)

Q7.

Solution

Concept: The Nitrogen Cycle.

Solution: The nitrogen cycle describes how nitrogen moves between the atmosphere, soil, and living organisms. Plants primarily absorb nitrogen from the soil in the form of nitrates (NO). The conversion of atmospheric nitrogen into nitrates involves multiple steps:

- **Nitrogen Fixation:** Inert atmospheric nitrogen gas (N) is converted into ammonia (NH) or ammonium (NH). This is the crucial first step to make atmospheric nitrogen available to the ecosystem.
- **Nitrification:** This is a two-step process where soil bacteria convert ammonium into nitrates.
  (a) First, bacteria like Nitrosomonas oxidize ammonium (NH) to nitrite (NO).
  (b) Second, bacteria like Nitrobacter oxidize nitrite (NO) to nitrate (NO).
- The question asks for the process that results in nitrates usable by plants. That specific process is nitrification. It is the direct pathway for producing nitrates in the soil from ammonium, which originates from either nitrogen fixation or the decomposition of organic matter (ammonification).

Final Answer : "Nitrification"

Answer: (C)

Q8.

Solution

Concept: Agrometeorology and Crop Phenology.

Solution: The growing season is the period of the year when climatic conditions are suitable for crop growth and development. The single most crucial factor that defines the beginning and end of this period in most agricultural regions is temperature.

- Plant metabolic processes, such as photosynthesis and respiration, are temperature-dependent and only occur within a specific temperature range.
- The length of the growing season is commonly defined by temperature thresholds, specifically the period between the last killing frost in the spring and the first killing frost in the autumn.
- Below a certain minimum temperature, growth ceases, and frost can cause irreversible damage to plant tissues.
- While rainfall is critical for growth (and may define the growing season in some tropical or arid zones), temperature is the more universal factor that dictates the fundamental length of time available for a crop to mature.

Final Answer : "Temperature"

Answer: (B)

Q9.

Solution

Concept: Energy Balance in Agriculture.

Solution: Latent heat of vaporization is the amount of heat energy required to convert a unit mass of a liquid into a vapor at a constant temperature. This physical principle is central to the water cycle and energy balance in the environment.

- In agrometeorology, this concept is most closely associated with evapotranspiration (ET).
- ET is the combined process of:
  (a) **Evaporation:** The phase change of water from liquid to vapor from soil and water surfaces.
  (b) **Transpiration:** The release of water vapor from plant leaves into the atmosphere.
- Both processes involve changing liquid water into water vapor. This phase change consumes a large amount of solar energy from the environment in the form of latent heat. This energy transfer is a major mechanism for cooling plant canopies and the Earth's surface.

Final Answer : "Evapotranspiration"

Answer: (B)

Q10.

Solution

Concept: Classification of Livestock Breeds.

Solution: Cattle breeds are often categorized based on their primary utility, such as dairy (for milk), draught (for work), or dual-purpose (for both).

- **Sahiwal** and **Gir** are renowned Indian Zebu breeds, but they are primarily classified as dairy breeds due to their high milk production potential.
- **Jersey** is a specialized dairy breed from Europe, known for its high-fat milk, and is not used for draught purposes.
- **Ongole**, a breed from Andhra Pradesh, India, is a classic example of a dual-purpose animal. The cows are fair milkers, while the bullocks are large, powerful, and highly valued for their strength and stamina in ploughing fields and pulling carts. Their robustness makes them excellent draught animals.

Final Answer : "Ongole"

Answer: (C)

Q11.

Solution

Concept: Veterinary Virology and Poultry Diseases.

Solution: Ranikhet disease, also known as Newcastle Disease, is a highly contagious and serious viral disease of poultry. The incubation period (the time from infection to the appearance of symptoms) is a critical aspect of its epidemiology.

- This period is primarily influenced by the viral strain virulence. The Newcastle Disease Virus (NDV) exists in strains of varying virulence:
  - **Lentogenic strains** (low virulence) cause mild disease and have a longer incubation period.
  - **Mesogenic strains** (moderate virulence) cause respiratory and nervous signs with an intermediate incubation period.
  - **Velogenic strains** (high virulence) are the most deadly, causing severe disease with a very short incubation period, often just 2-6 days.
- While other factors like host age, immune status, and dose of virus can play a role, the intrinsic genetic makeup of the viral strain is the most dominant factor determining how quickly the disease develops and its severity.

Final Answer : "Viral strain virulence"

Answer: (C)

Q12.

Solution

Concept: Dairy Production Terminology.

Solution: In the management of dairy animals, specific terms are used to define different stages of the production and reproductive cycle.

- Lactation is the process of producing milk. The lactation period refers to the length of time a cow actively secretes milk.
- This period begins at calving (giving birth) and ends when the cow is "dried off" (milking is ceased) to allow her to prepare for the next calving.
- In commercial dairy operations, the standard lactation period is about 305 days (approximately 10 months), followed by a dry period of about 60 days. The total time from one calving to the next is the "calving interval."

Final Answer : "Duration of milk secretion"

Answer: (B)

Q13.

Solution

Concept: Metabolic Diseases in Livestock.

Solution: Milk fever, also known as parturient paresis or hypocalcemia, is a metabolic disorder that primarily affects high-yielding dairy cows around the time of calving.

- The disease is caused by an acute deficiency of Calcium in the bloodstream.
- At the onset of lactation, the cow's body has a sudden, massive demand for calcium to produce colostrum and milk. Colostrum contains a very high concentration of calcium.
- If the cow cannot mobilize calcium quickly enough from her bones or absorb it from her diet to meet this demand, her blood calcium level drops sharply.
- This low blood calcium (hypocalcemia) impairs nerve impulse transmission and muscle contraction, leading to symptoms like muscle weakness, staggering, inability to stand, and potentially death if left untreated.

Final Answer : "Calcium"

Answer: (B)

Q14.

Solution

Concept: Livestock Health Management.

Solution: Deworming is a routine and essential health management practice for livestock. It involves the administration of drugs known as anthelmintics.

- The main and direct objective of deworming is to eliminate internal parasites, such as roundworms, tapeworms, and flukes, from the animal's body.
- These parasites live in the gastrointestinal tract, lungs, and other organs, where they cause damage, compete for nutrients, and can lead to poor growth, reduced milk or meat production, anemia, and increased susceptibility to other diseases.
- By removing the worm burden, the animal's health is restored, allowing it to utilize feed more efficiently, gain weight, and maintain productivity. Positive outcomes like increased feed intake are a consequence of achieving the primary objective of eliminating parasites.

Final Answer : "Eliminate internal parasites"

Answer: (B)

Q15.

Solution

Concept: Soil Science and Classification.

Solution: Black cotton soils, also known as Regur soils, are a type of soil classified as Vertisols. They are predominantly found in the Deccan Plateau region of India and are well-suited for growing cotton.

- Their most defining characteristic is their high content of clay, specifically a type of clay mineral called montmorillonite.
- This mineral gives the soil a high water retention and swelling nature.
- When wet, the soil absorbs a large volume of water and swells, becoming very sticky and difficult to work with.
- When it dries, the soil shrinks dramatically, leading to the formation of deep and wide cracks. This shrink-swell property is the hallmark of black cotton soils.
- They have low permeability due to their fine texture and are generally fertile, not low in fertility. Their texture is clayey, not sandy.

Final Answer : "High water retention and swelling nature"

Answer: (B)

Q16.

Solution

Concept: Soil Science and Nutrient Dynamics.

Solution: Leaching is the process by which soluble nutrients, such as nitrates and sulfates, are washed down through the soil profile beyond the reach of plant roots. This downward movement is driven by water percolating through the soil.

- This process requires a significant amount of water moving vertically through the soil. Such a condition occurs during periods of heavy rainfall or excessive irrigation, where the amount of water entering the soil exceeds its field capacity (the amount of water it can hold against gravity).
- The excess water then moves downwards, dissolving and carrying nutrients with it.
- **Low rainfall** and **high evaporation** lead to a net upward movement of soil water (capillary action) or no movement, preventing leaching.
- **Strong winds** primarily contribute to wind erosion and increased evaporation, but do not directly cause leaching.

Final Answer : "Heavy rainfall"

Answer: (C)

Q17.

Solution

Concept: Soil-Plant-Water Relationships.

Solution: The "wilting point," more specifically the Permanent Wilting Point (PWP), is a critical threshold in soil moisture. It is defined as the minimum amount of water in the soil that the plant requires not to wilt.

- When soil moisture depletes to this point, the water is held so tightly by soil particles (due to adhesion and cohesion) that plant roots cannot exert enough force to absorb it.
- At this stage, the plant begins to wilt. Even if the plant is moved to a 100% humid atmosphere to stop all water loss through transpiration, it cannot regain its turgor because it is unable to extract water from the soil. Therefore, the wilting is considered irreversible, and the plant will eventually die unless water is added to the soil.
- The other options describe different states of soil moisture:
  - **Maximum water content** or **Soil saturation** is when all soil pores are filled with water.
  - **Water logging condition** is a prolonged state of saturation, which is harmful to most plants.

Final Answer : "Minimum water at which plants wilt irreversibly"

Answer: (B)

Q18.

Solution

Concept: Irrigation Engineering and Water Management.

Solution: The choice of irrigation method depends heavily on factors like soil type, crop, water availability, and land topography. For uneven or undulating land, surface irrigation methods that rely on gravity for water distribution are inefficient.

- **Basin, flood, and furrow irrigation** are all surface methods. They work best on precisely leveled or graded land, as they use gravity to spread water over the field. On uneven land, water would accumulate in low spots and not reach the higher areas, leading to poor uniformity.
- **Sprinkler irrigation** is a pressurized system that sprays water through the air, simulating rainfall. The water falls onto the land from above, allowing for a relatively uniform distribution even on land with irregular slopes and topography. This makes it the most suitable method for such conditions, as it does not require extensive land leveling.

Final Answer : "Sprinkler irrigation"

Answer: (B)

Q19.

Solution

Concept: Weed Science and Herbicide Classification.

Solution: Herbicides are chemicals used to control or kill unwanted plants (weeds). They are classified based on their selectivity, mode of action, and application timing.

- Selective herbicides are designed to kill specific target weeds while leaving the desired crop relatively unharmed. This selectivity is based on physiological or morphological differences between the crop and the weed. For example, a herbicide might target broadleaf weeds but not affect grass crops like corn or wheat. This allows for post-emergence application directly onto the field.
- **Non-selective herbicides** (e.g., glyphosate) kill or damage all plants they come in contact with and are used for total vegetation control.
- **Contact herbicides** kill only the plant parts they directly touch.
- **Residual herbicides** remain active in the soil for a period, controlling weeds that germinate after application.

Final Answer : "Selective herbicides"

Answer: (B)

Q20.

Solution

Concept: Agronomy and Cropping Systems.

Solution: Cropping systems describe the patterns and management of crops grown on a piece of land over time.

- Intercropping is the practice of growing two or more different crops simultaneously in the same field in a specific arrangement. This system aims to increase productivity per unit area, improve resource use efficiency (light, water, nutrients), and reduce pest and disease pressure. Examples include planting maize with beans or millet with cowpea.
- **Crop rotation** involves growing different crops in a planned sequence on the same field over different seasons or years.
- **Monocropping** is the practice of growing a single crop year after year on the same land.
- **Relay cropping** is a form of intercropping where the second crop is sown before the first crop is harvested, allowing for an overlap in their life cycles.

Final Answer : "Intercropping"

Answer: (B)

Q21.

Solution

Concept: Conservation Agriculture.

Solution: Zero tillage, or no-till farming, is a cornerstone of conservation agriculture. It is a method of growing crops without disturbing the soil through tillage.

- The primary and most significant benefit of adopting zero tillage is the reduction of soil erosion.
- Conventional tillage leaves the soil bare and pulverized, making it highly vulnerable to being washed away by rain (water erosion) or blown away by wind (wind erosion).
- In a zero-tillage system, the residue from the previous crop is left on the soil surface. This layer of mulch protects the soil from the impact of raindrops, slows down the surface runoff of water, and shelters the soil from wind. This drastically reduces soil loss and helps in conserving the topsoil, which is rich in organic matter and nutrients.
- Over time, zero tillage also helps improve soil fertility and water availability, but its main purpose is to combat erosion.

Final Answer : "Soil erosion"

Answer: (B)

Q22.

Solution

Concept: History of Indian Agriculture.

Solution: The Green Revolution refers to a period of technological advancements in agriculture that led to a dramatic increase in crop production in several developing countries, most notably in India during the 1960s and 1970s.

- The revolution was spearheaded by the development and introduction of high-yielding varieties (HYVs) of cereal grains.
- In India, the program focused primarily on wheat and rice. Dr. M.S. Swaminathan, in collaboration with Dr. Norman Borlaug, introduced semi-dwarf, high-yielding, and disease-resistant wheat varieties. This was followed by similar successes with rice varieties like IR-8.
- The adoption of these HYVs, along with an integrated package of practices including increased use of fertilizers, pesticides, and irrigation, led to a monumental increase in the production of these two staple food crops, transforming India from a food-deficient nation to one of self-sufficiency.

Final Answer : "Wheat and rice"

Answer: (C)

Q23.

Solution

Concept: Principles of Organic Farming.

Solution: Organic farming is a holistic production management system that avoids the use of synthetic fertilizers, pesticides, and genetically modified organisms. The core principle is to maintain and enhance soil health and ecosystem balance naturally.

- To improve and maintain soil fertility, organic farming relies on natural inputs that build soil organic matter. The most common and foundational of these is farmyard manure (FYM).
- FYM, which is a mixture of cattle dung, urine, and bedding material, is a rich source of plant nutrients and organic matter. It improves soil structure, water-holding capacity, and microbial activity, leading to long-term soil fertility.
- Other natural inputs used include compost, green manure, crop rotation with legumes, and biofertilizers.
- **Chemical fertilizers** and **synthetic pesticides** are explicitly prohibited in certified organic farming.

Final Answer : "Farmyard manure"

Answer: (B)

Q24.

Solution

Concept: Horticulture and Abiotic Stress.

Solution: Frost is the formation of ice crystals on surfaces when the temperature drops to 0°C or below. It is a major threat to many fruit crops, especially during the flowering and fruit-set stages, as the reproductive organs are delicate and highly susceptible to freezing injury.

- Mango is a tropical and subtropical fruit crop that is extremely sensitive to low temperatures. A frost event during its flowering period (typically in late winter or early spring) can cause the flowers and panicles to freeze and die, leading to a complete failure of the fruit set and total crop loss for the season. This makes it one of the most frost-sensitive crops among the options during its reproductive phase.
- Citrus is also sensitive, but some varieties have more tolerance than mango.
- Apple is a temperate fruit that requires a chilling period and is inherently more cold-hardy, although a severe frost during bloom can still be damaging.
- Banana is a tropical plant sensitive to cold in general, but its flowering is less seasonally synchronized and it is often grown in frost-free zones.

Final Answer : "Mango"

Answer: (A)

Q25.

Solution

Concept: Horticulture and Plant Propagation.

Solution: Layering is a method of vegetative propagation where a new plant is formed from a stem that is still attached to the parent plant. The stem is induced to form roots while it is attached, and once the roots are well-developed, the new plant is detached.

- This method is particularly well-suited for plants that have long, flexible stems that can be bent down to the soil (simple layering) or for plants that readily produce roots from their stems.
- This characteristic is most common in woody shrubs and climbing plants (vines). Many ornamental shrubs like jasmine, forsythia, bougainvillea, and rhododendron are commonly propagated by layering. The flexible woody stems can be easily manipulated to make contact with a rooting medium while still receiving support from the parent plant.
- It is generally not used for herbaceous plants (which are often propagated by cuttings or division) or annual crops (which are grown from seed).

Final Answer : "Woody shrubs"

Answer: (B)

Q26.

Solution

Concept: The Hardy–Weinberg principle describes the genetic equilibrium in a population. The key equations are:

Allele frequency: $p + q = 1$ (where p is the frequency of the dominant allele and q is the frequency of the recessive allele).
Genotype frequency: $p^2 + 2pq + q^2 = 1$ (where p^2 is the frequency of homozygous dominant individuals, 2pq is the frequency of heterozygous individuals, and q^2 is the frequency of homozygous recessive individuals).
Solution: We are given the frequency of the recessive allele (q) = 0.2. First, we find the frequency of the dominant allele (p) using the equation $p + q = 1$. $p = 1 - q$ $p = 1 - 0.2$ $p = 0.8$

Next, we calculate the frequency of heterozygous individuals using the term 2pq from the genotype frequency equation. Frequency of heterozygous individuals = $2pq = 2 \times 0.8 \times 0.2 = 2 \times 0.16 = 0.32$

Thus, the frequency of heterozygous individuals in the population is 0.32.
Final Answer : "0.32"

Answer: (B)

Q27.

Solution

Concept: Genetic variation is the diversity in gene frequencies within a population. Several evolutionary forces can alter this variation.

Solution: The question asks for a mechanism that maintains or increases genetic variation, even when selection pressure is acting to reduce it.

- **Mutation:** This is the ultimate source of new alleles in a population. Mutations are random changes in the DNA sequence. By creating new genetic material, mutation directly introduces and maintains genetic variation, counteracting the effects of selection and genetic drift that tend to remove variation.
- **Genetic drift:** This refers to random fluctuations in allele frequencies, especially in small populations. It typically leads to the loss of alleles and a reduction in genetic variation.
- **Inbreeding:** This is mating between closely related individuals. It increases the proportion of homozygotes and decreases the proportion of heterozygotes, often exposing deleterious recessive alleles to selection and reducing overall genetic variation.
- **Stabilizing selection:** This type of natural selection favors intermediate phenotypes and selects against extreme variations, thus reducing the genetic variation for a particular trait.

Therefore, mutation is the primary mechanism that introduces new genetic variation, maintaining it in a population.

Final Answer : "Mutation"

Answer: (B)

Q28.

Solution

Concept: Transcription is the process of synthesizing an RNA molecule from a DNA template. The process is governed by the principle of complementarity and the antiparallel nature of nucleic acid strands.

Solution: During transcription, the enzyme RNA polymerase synthesizes a new RNA strand. Like DNA polymerase, RNA polymerase can only add new ribonucleotides to the 3' end of the growing RNA chain. This means that the RNA molecule is synthesized in the 5' $\rightarrow\rightarrow$ 3' direction.
Because nucleic acid strands are antiparallel, for the new RNA to be built in the 5' $\rightarrow\rightarrow$ 3' direction, the RNA polymerase must move along and read the template DNA strand in the opposite direction, which is 3' $\rightarrow\rightarrow$ 5'.

Final Answer : "3' $\rightarrow\rightarrow$ 5'"

Answer: (B)

Q29.

Solution

Concept: Plant tissue culture is a collection of techniques used to maintain or grow plant cells, tissues, or organs under sterile conditions on a nutrient culture medium of known composition.

Solution:

- **Micropropagation** is a specific plant tissue culture technique used for the large-scale, rapid multiplication of plants. It involves taking a small piece of plant tissue (an explant) and growing it in a sterile, artificial medium under controlled laboratory conditions. This process produces a large number of genetically identical plants (clones). A key advantage is the ability to produce disease-free plants, especially by using meristem tissue, which is typically free of viruses.
- **Hybridization** is the process of crossing two genetically different parents to create new combinations of genes. It is a method for creating new varieties, not for multiplying existing ones.
- **Mutation breeding** involves inducing mutations to create new traits.
- **Backcrossing** is a breeding method used to transfer a specific gene into a desired genetic background.

Therefore, micropropagation is the correct technique for rapid, clonal, and disease-free plant multiplication.

Final Answer : "Micropropagation"

Answer: (B)

Q30.

Solution

Concept: Enzymes are classified into major groups based on the type of chemical reaction they catalyze, according to the Enzyme Commission (EC) numbering system.

Solution: The six major classes of enzymes are:

(a) **Oxidoreductases (EC 1):** Catalyze oxidation-reduction (redox) reactions, where electrons are transferred from one molecule (the reductant) to another (the oxidant).

(b) **Transferases (EC 2):** Catalyze the transfer of a functional group (e.g., a methyl or phosphate group) from one molecule to another.

(c) **Hydrolases (EC 3):** Catalyze the hydrolysis of a chemical bond (i.e., cleavage of bonds by the addition of water).

(d) **Lyases (EC 4):** Catalyze the cleavage of various chemical bonds by means other than hydrolysis and oxidation, often forming a new double bond or a new ring structure.

(e) **Isomerases (EC 5):** Catalyze the rearrangement of atoms within a molecule, thus converting one isomer to another.

(f) **Ligases (EC 6):** Catalyze the joining of two molecules, coupled with the hydrolysis of a high-energy phosphate bond in ATP or another nucleotide.

The question asks for the class that catalyzes oxidation-reduction reactions, which is Oxidoreductases.

Final Answer : "Oxidoreductases"

Answer: (C)

Q31.

Solution

Concept: The nitrogen cycle involves the conversion of nitrogen between its various chemical forms. Nitrification is a key step in this cycle.

Solution: Nitrification is the biological oxidation of ammonia (NH) to nitrate (NO) and is a two-step process carried out by different groups of microorganisms:

(a) **Ammonia to Nitrite:** Ammonia (or ammonium, NH) is first oxidized to nitrite (NO). This step is performed by ammonia-oxidizing bacteria. The most well-known genus responsible for this is *Nitrosomonas*.

(b) **Nitrite to Nitrate:** The nitrite (NO) is then further oxidized to nitrate (NO). This step is performed by nitrite-oxidizing bacteria, such as *Nitrobacter*.

Rhizobium and *Azotobacter* are nitrogen-fixing bacteria that convert atmospheric nitrogen (N) into ammonia. Therefore, *Nitrosomonas* is the group of microorganisms that converts ammonia into nitrites.

Final Answer : "Nitrosomonas"

Answer: (B)

Q32.

Solution

Concept: Meteorological instruments are tools used to measure various atmospheric conditions.

Solution: The functions of the listed instruments are:

- **Hygrometer:** Measures humidity, which is the amount of water vapor in the air.
- **Anemometer:** Measures wind speed. It typically consists of cups that rotate as the wind blows, and the speed of rotation is converted into a wind speed measurement.
- **Barometer:** Measures atmospheric pressure. Changes in atmospheric pressure can indicate forthcoming weather changes.
- **Thermometer:** Measures temperature.

For measuring wind speed in agricultural fields or any other location, an anemometer is used.

Final Answer : "Anemometer"

Answer: (B)

Q33.

Solution

Concept: The development of plant diseases is influenced by three factors, often depicted as the "disease triangle": a virulent pathogen, a susceptible host, and a favorable environment.

Solution: Fungal pathogens require specific environmental conditions to thrive, infect a host, and spread. For most plant-pathogenic fungi:

- **High Humidity:** Moisture is critical. High humidity, dew, or rain provides the free water needed for fungal spores to germinate and for the germ tubes to penetrate the host plant tissue.
- **Moderate Temperature:** While temperature optima vary by species, most fungi grow and infect most effectively within a moderate temperature range (e.g., 15-30°C). Extreme cold or heat can inhibit their growth.

Low humidity is a strong limiting factor for fungal diseases as it causes spores and mycelium to desiccate. Therefore, the combination of high humidity and moderate temperature is the most favorable condition for the development and spread of most fungal diseases in crops.
Final Answer : "High humidity and moderate temperature"

Answer: (B)

Q34.

Solution

Concept: Different cattle breeds, both indigenous (Indian) and exotic, are known for specific traits such as milk quantity, milk fat content, draft power, or hardiness.

Solution: The question asks for an **Indian** cattle breed known for high milk fat.

- **Holstein Friesian:** An exotic breed from the Netherlands, famous for producing the highest volume of milk, but with a relatively low fat content (around 3.5
- **Jersey:** An exotic breed from the Isle of Jersey, known for its milk with a very high fat content (4.5-5.5
- **Gir:** A prominent indigenous dairy breed (*Bos indicus*) originating from the Gir region of Gujarat, India. It is well-regarded for its hardiness and its milk, which has a high fat content, typically ranging from 4.5% to 5.0%.
- **Brown Swiss:** An exotic breed from Switzerland known for high milk protein and fat content, but not an Indian breed.

Among the choices given, Gir is the Indian breed specifically known for high milk fat content.
Final Answer : "Gir"

Answer: (C)

Q35.

Solution

Concept: Infectious diseases in cattle are characterized by specific sets of clinical signs.

Solution: Let's analyze the symptoms of the diseases listed:

- **FMD (Foot-and-Mouth Disease):** Caused by a virus. Characterized by fever and blisters (vesicles) on the tongue, lips, in the mouth, on the teats, and between the toes. Mortality is low in adults.
- **Rinderpest (Cattle Plague):** A highly contagious and fatal viral disease (now globally eradicated). Its classic signs included high fever, erosive lesions in the mouth, profuse nasal and ocular discharge, and severe, often bloody, diarrhea leading to extreme dehydration and a very high mortality rate. This perfectly matches the description.
- **Mastitis:** Inflammation of the udder, typically caused by a bacterial infection. Symptoms are localized to the udder (swelling, pain, abnormal milk).
- **Anthrax:** A serious bacterial disease causing sudden death. It can present with high fever, but severe diarrhea is not the most defining sign; bloody discharges from natural orifices post-mortem are more characteristic.

The combination of high fever, nasal discharge, and severe diarrhea with high mortality is the classic presentation of Rinderpest.

Final Answer : "Rinderpest"

Answer: (B)

Q36.

Solution

Concept: Dry Matter Intake (DMI) is the amount of feed an animal consumes on a moisture-free basis. It is the most critical factor determining the nutrient supply to the animal.

Solution: Several factors influence an animal's Dry Matter Intake, but some are more fundamental than others.

- **Animal body weight:** This is the primary factor. Larger animals have greater metabolic needs for maintenance, growth, and production, and thus a higher capacity to consume feed. DMI is often calculated and predicted as a percentage of the animal's body weight (e.g., a dairy cow might consume 3-4% of its body weight in dry matter daily).
- **Color of feed:** This has a negligible effect on intake.
- **Type of housing:** This is a secondary, environmental factor. Poor housing can cause stress and reduce intake, but it is not the primary determinant.
- **Season only:** Season can influence DMI through its effect on environmental temperature (heat stress reduces intake) and forage quality/availability, but it is an external factor. The animal's intrinsic size and production level are more direct drivers.

Therefore, DMI primarily depends on the animal's own characteristics, with body weight being the most fundamental.

Final Answer : "Animal body weight"

Answer: (A)

Q37.

Solution

Concept: The role of essential vitamins in the health and development of poultry.

Solution: Curled-toe paralysis in young chickens is a classic symptom of Vitamin B 2 2 (Riboflavin) deficiency. Riboflavin is essential for nerve health, and a lack of it leads to the degeneration of the sciatic nerves, causing the bird's toes to curl inwards.

- Vitamin A deficiency causes nutritional roup and poor vision.
- Vitamin B 1 1

  (Thiamine) deficiency causes polyneuritis, characterized by a "star-gazing" posture.
- Vitamin D deficiency leads to rickets (weak bones) and soft-shelled eggs.

"**Final Answer : "Vitamin B 2 2**
"

Answer: (C)

Q38.

Solution

Concept: Characteristics of different soil horizons in a typical soil profile.

Solution: A soil profile is divided into layers called horizons.

- **O-horizon:** The topmost layer, composed of fresh and decomposing organic litter (leaves, twigs).
- **A-horizon:** Known as topsoil, it is a mixture of mineral soil and well-decomposed organic matter called humus. This horizon is dark in color and is the zone of most intense biological and microbial activity, making it the richest in nutrients and life.
- **B-horizon:** Subsoil, where minerals and clays leached from the A-horizon accumulate. It has less organic matter and microbial activity.
- **C-horizon:** The parent material, consisting of weathered rock from which the soil is formed.

Therefore, the A-horizon is the richest in stabilized organic matter and microbial activity.
Final Answer : "A-horizon"

Answer: (B)

Q39.

Solution

Concept: Factors determining the Cation Exchange Capacity (CEC) of soil.

Solution: Cation Exchange Capacity (CEC) is a measure of the soil's ability to hold positively charged ions (cations), such as essential plant nutrients like calcium (Ca^{2+}), magnesium (Mg^{2+}), and potassium (K^{+}). This ability comes from negatively charged sites on the surface of soil particles. The two main components in soil that provide these negative charges are clay minerals and organic matter (humus). Therefore, soils with higher percentages of clay and organic matter have a higher CEC and are generally more fertile. Soil color, temperature, and crop type do not directly determine the inherent CEC of a soil.

Final Answer : "Clay and organic matter content"

Answer: (B)

Q40.

Solution

Concept: The specific roles of primary macronutrients in plant physiology.

Solution: While all macronutrients are essential, they have specialized roles.

- **Nitrogen (N):** Primarily responsible for vegetative, leafy growth and is a major component of chlorophyll.
- **Phosphorus (P):** Crucial for energy transfer reactions (ATP), cell division, and the formation of DNA. This makes it vital for early plant life, particularly for the development of a strong root system and for seedling vigor.
- **Potassium (K):** Acts as a regulator for many plant processes, including water movement (stomatal opening/closing) and disease resistance.
- **Sulfur (S):** A key component of certain amino acids and proteins.

For root development and early growth, phosphorus is the most critical nutrient.

Final Answer : "Phosphorus"

Answer: (B)

Q41.

Solution

Concept: Terminology used in irrigation water management.

Solution: The "duty of water" is a term that defines the relationship between the volume of water applied and the area of land it can irrigate. Specifically, it is defined as the area of land, usually in hectares or acres, that can be irrigated to bring a crop to maturity by a unit of water (e.g., one cubic meter per second or one cusec) flowing continuously throughout the entire base period of that crop. It essentially represents the water-use efficiency of an irrigation project. A higher duty of water implies that a larger area can be irrigated with the same amount of water.

Final Answer : "Area irrigated per unit discharge of water"

Answer: (B)

Q42.

Solution

Concept: Different methods and strategies for weed control in agriculture.

Solution: Weed control methods are broadly categorized:

- **Mechanical control:** Involves physical methods like hand-pulling, hoeing, tillage, or mowing.
- **Chemical control:** Involves the application of herbicides to kill or inhibit weed growth.
- **Biological control:** Involves the deliberate use of living organisms, such as insects, pathogens, or herbivores (like goats), which are natural enemies of the target weed, to suppress its population.
- **Cultural control:** Involves modifying farming practices like crop rotation, cover cropping, and adjusting planting density to give the crop a competitive advantage over weeds.

The use of natural predators falls under biological control.

Final Answer : "Biological control"

Answer: (C)

Q43.

Solution

Concept: Different types of cropping systems used to maximize land and resource use.

Solution: The cropping practices listed have distinct definitions:

- **Intercropping:** Growing two or more crops simultaneously in the same field in a specific row pattern.
- **Relay cropping:** A system where a second crop is sown into the field before the first crop has been harvested. The life cycles of the two crops overlap for a period. This is analogous to a relay race where one runner passes the baton to the next before stopping.
- **Mixed cropping:** Growing two or more crops simultaneously in the same field without any distinct row arrangement.
- **Crop rotation:** Growing different types of crops in the same area in sequenced seasons.

The practice described is relay cropping.
Final Answer : "Relay cropping"

Answer: (B)

Q44.

Solution

Concept: Modern agricultural systems and the role of technology.

Solution: Precision farming, also known as precision agriculture, is a farm management concept based on observing, measuring, and responding to inter- and intra-field variability in crops. It uses advanced technologies like the Global Positioning System (GPS), Geographic Information Systems (GIS), remote sensing, and variable rate technology (VRT). GPS allows farmers to accurately map their fields and apply inputs like fertilizers, pesticides, and water only where they are needed and in the precise amounts required, which is known as site-specific crop management. This optimizes resource use and increases efficiency.
Final Answer : "Precision farming"

Answer: (B)

Q45.

Solution

Concept: Functions of major classes of plant hormones (phytohormones).

Solution: Plant growth and development are regulated by hormones. Each has primary functions:

- **Auxin:** Primarily promotes cell elongation, especially in stems. It is also responsible for apical dominance, phototropism (growing towards light), and root initiation.
- **Cytokinin:** Primarily promotes cell division (cytokinesis) and shoot formation.
- **Ethylene:** A gaseous hormone that promotes fruit ripening, senescence, and leaf abscission.
- **Abscisic acid (ABA):** A stress hormone that induces dormancy and causes stomatal closure during water stress.

The primary regulator of cell elongation and stem growth is auxin.
Final Answer : "Auxin"

Answer: (A)

Q46.

Solution

Concept: Fruit physiology, specifically the classification based on ripening behavior.

Solution: Fruits are classified into two groups based on their ripening process:

- **Climacteric fruits:** These fruits show a dramatic increase in respiration rate and ethylene production during ripening. This "climacteric rise" allows them to continue ripening even after being harvested. Examples include mango, banana, apple, pear, and tomato.
- **Non-climacteric fruits:** These fruits ripen gradually without a major spike in respiration or ethylene production. They must be harvested when ripe as they do not ripen significantly after being picked. Examples include citrus fruits (orange, lemon), grape, pineapple, and strawberry.

Among the given options, mango is a climacteric fruit.
Final Answer : "Mango"

Answer: (C)

Q47.

Solution

Concept: Methods of asexual (vegetative) propagation in plants.

Solution: The various methods of vegetative propagation are:

- **Grafting/Budding:** Joining a scion or bud from one plant onto the rootstock of another.
- **Cutting:** Growing a new plant from a piece of stem, leaf, or root.
- **Layering:** A method where a stem is induced to form roots while still attached to the parent plant. The technique of bending a low-lying, flexible branch to the ground and covering a portion of it with soil to encourage root formation is known as simple layering.

This method ensures the new plantlet receives water and nutrients from the parent until its own root system is established.
Final Answer : "Layering"

Answer: (C)

Q48.

Solution

Concept: The science of food preservation, specifically the principles of jelly making.

Solution: The formation of a gel in jelly preparation is a chemical process that requires a precise balance of four key ingredients: pectin, acid, sugar, and water.

- **Pectin:** A naturally occurring polysaccharide found in the cell walls of fruits. It is the primary gelling agent. When heated in the presence of acid and sugar, long chains of pectin molecules form a mesh-like network that traps the liquid, resulting in a gel.
- **Acid:** Helps extract pectin from the fruit and provides the acidic environment necessary for the gel to set.
- **Sugar:** Acts as a preservative and helps the pectin network form by attracting water molecules away from the pectin.

The most critical factor for gel formation is an adequate concentration of pectin.
Final Answer : "Pectin concentration"

Answer: (B)

Q49.

Solution

Concept: Post-harvest technology for extending the storage life of fresh produce.

Solution: Controlled Atmosphere (CA) storage is a technology used to prolong the shelf life of fruits and vegetables, especially climacteric fruits like apples. The primary goal is to slow down the natural processes of respiration and ripening. This is achieved by precisely modifying and maintaining the atmosphere within an airtight storage facility. Specifically, it involves regulating the **gas composition** by:

- Reducing the oxygen (O 2 2

) level (typically to 1-2%).
- Increasing the carbon dioxide (CO 2 2

) level (typically to 2-5%).
- Maintaining low temperatures and high humidity.

This altered atmosphere significantly reduces the metabolic rate of the produce, delaying senescence and decay.

Final Answer : "Gas composition around produce"

Answer: (B)

Q50.

Solution

Concept: Fundamental horticultural practices for plant management and care.

Solution: The practices listed are common in horticulture and agriculture:

- **Mulching:** Applying a layer of material (like straw, bark, or plastic) to the soil surface to conserve moisture, control weeds, and regulate soil temperature.
- **Pruning:** The selective and strategic removal of plant parts, such as branches, buds, or roots. It is done to remove dead or diseased wood, improve plant structure, increase light penetration and air circulation, and enhance fruit or flower production.
- **Irrigation:** The artificial application of water to the land or soil.
- **Fertigation:** The application of fertilizers through an irrigation system.

The removal of unwanted branches is the definition of pruning.

Final Answer : "Pruning"

Answer: (B)

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	2	B	3	B	4	B	5	B
6	C	7	C	8	B	9	B	10	C
11	C	12	B	13	B	14	B	15	B
16	C	17	B	18	B	19	B	20	B
21	B	22	C	23	B	24	A	25	B
26	B	27	B	28	B	29	B	30	C
31	B	32	B	33	B	34	C	35	B
36	A	37	C	38	B	39	B	40	B
41	B	42	C	43	B	44	B	45	A
46	C	47	C	48	B	49	B	50	B