Rajasthan JET Agriculture Sample Paper-1

Duration: 40 Minutes **Maximum Marks: 160**

Instructions

- This paper contains **40** Multiple Choice Questions (Single Correct).
- Each correct answer carries **+4 marks**.
- Each incorrect answer carries: **−1 marks**.
- Use of mobile phones, smartwatches, calculators, or any electronic gadgets is strictly prohibited.

Q1. Which of the following indigenous breeds of cattle is known for its high heat tolerance, disease resistance, and is primary native to the dry regions of Tharparkar district, showing excellent performance in arid climates?

(A) Holstein Friesian

(B) Tharparkar

(C) Jersey

(D) Gir

Q2. In high-tech nursery management, which of the following media components is primarily used to improve aeration and moisture retention due to its sterile, lightweight, and highly porous expanded volcanic rock properties?

(A) Perlite

(B) Vermicompost

(C) Coco peat

(D) Clay loam

Q3. Which type of tillage implement is most appropriate for breaking hardpans deep inside the subsoil layers without turning the topsoil upside down?

(A) Disc plow

(B) Subsoiler (Chisel plow)

(C) Rotavator

(D) Harrow

Q4. A farmer observes distinct purple coloration on the older leaves of a maize crop, followed by poor root development and delayed maturity. This condition is most likely a deficiency of which essential plant nutrient?

(A) Nitrogen

(B) Potassium

(C) Phosphorus

(D) Zinc

Q5. The processing operation called 'clononal mass selection' in self-pollinated crops belongs to which category of crop improvement methods?

(A) Hybridization

(B) Plant Introduction

(C) Selection Methods

(D) Mutation Breeding

Q6. Which of the following medicinal plants, highly integrated into Rajasthan's arid farming systems, is commercially valued primarily for its mucilaginous seed husk used as a natural laxative?

(A) Isabgol (*Plantago ovata*)

(B) Ashwagandha

(C) Safed Musli

(D) Guggal

Q7. Under the Kisan Credit Card (KCC) scheme, what type of credit facility is provided to meet the short-term credit requirements for cultivation of crops, post-harvest expenses, and consumption requirements of farmer households?

(A) Long-term investment loan only

(B) Revolving cash credit facility

(C) Fixed non-renewable term loan

(D) Real estate agricultural mortgage

Q8. The physiological disorder 'Bitter pit' in fruits or 'Blossom end rot' in tomatoes is universally associated with the deficiency or restricted translocation of which nutrient element?

(A) Magnesium

(B) Boron

(C) Calcium

(D) Zinc

Q9. Which system of orchard planting accommodates approximately 15% more plants than the standard square system while utilizing an additional filler tree at the center of each square?

(A) Hexagonal system

(B) Quincunx system

(C) Contour system

(D) Rectangular system

Q10. For the standard evaluation of fat and solid-not-fat (SNF) content in raw milk using a lactometer, at what specific standard temperature reference should the reading be calibrated for accuracy?

(A) 4°C

(B) 27°C or 60°F

(C) 40°C

(D) 0°C

Q11. Which structural component of a typical biogas plant acts as the standard anaerobic chamber where the biochemical breakdown of animal waste takes place by methanogenic bacteria?

(A) Inlet tank

(B) Gas holder

(C) Digester tank

(D) Outlet slurry tank

Q12. The dynamic meteorological process characterized by a short-term, localized atmospheric condition over a specific geographic area within a 24-hour cycle is formally termed as:

(A) Climate

(B) Weather

(C) Microclimate

(D) Agro-ecological zone

Q13. Which of the following methods of breeding is most effective for transferring a single specifically identifiable dominant trait, such as disease resistance, from a wild relative donor strain into a highly successful commercial agronomic cultivar?

(A) Mass selection

(B) Backcross method

(C) Pedigree method

(D) Bulk selection

Q14. In poultry production, the viral disease characterized by highly contagious respiratory distress, nervous symptoms, and high mortality rates, commonly known as Newcastle Disease, is termed as:

(A) Ranikhet disease

(B) Fowl Pox

(C) Coccidiosis

(D) Chronic Respiratory Disease (CRD)

Q15. Which post-harvest preservation technique involves removing historical field heat quickly from freshly harvested horticultural crops to inhibit microbial growth and reduce respiration rates?

(A) Blanching

(B) Pre-cooling

(C) Curing

(D) Waxing

Q16. The physiological phenomenon where seeds fail to germinate even when exposed to completely favorable environmental conditions due to internal structural or physiological characteristics is called:

(A) Scarification

(B) Seed Viability

(C) Seed Dormancy

(D) Stratification

Q17. Which of the following organic manures has the highest concentrated nutrient content compared to bulky organic manures like farmyard manure (FYM)?

(A) Groundnut cake

(B) Compost

(C) Vermicompost

(D) Green manure

Q18. Which irrigation method offers the highest water-use efficiency (up to 90-95%) by delivering water slowly and directly onto the root zone of crops through a network of pipes and emitters?

(A) Furrow irrigation

(B) Drip irrigation

(C) Sprinkler irrigation

(D) Border strip method

Q19. The primary historical and objective focus of launching 'Operation Flood' in India starting from 1970 was to:

(A) Create a nationwide flood management system

(B) Maximize marine fisheries production across coastlines

(C) Establish a nationwide milk grid to increase dairy production and rural incomes

(D) Distribute high-yielding organic fertilizers to crop growers

Q20. Which of the following chemical agents is universally used as a preservative in light-colored or colorless fruit juices and squashes to check microbial spoilage?

(A) Sodium benzoate

(B) Potassium metabisulphite (KMS)

(C) Citric acid

(D) Sodium chloride

Q21. The training system of grapes where vines are trained on horizontal arbors or bowers to provide maximum surface canopy area for higher productivity is known as:

(A) Bower / Pergola system

(B) Kniffin system

(C) Head system

(D) Telephone system

Q22. Which parasitic weed attaches itself exclusively to the roots of mustard crops in Rajasthan, causing severe yield losses if left uncontrolled?

(A) *Cuscuta* (Dodder)

(B) *Orobanche* (Broomrape)

(C) *Striga* (Witchweed)

(D) *Loranthus*

Q23. Which of the following fruit crops is highly drought-resistant, exceptionally tolerant to saline-alkaline soils, and is widely grown under the arid conditions of western Rajasthan for its nutritious small, round stone fruits?

(A) Banana

(B) Guava

(C) Ber (*Ziziphus mauritiana*)

(D) Papaya

Q24. The systematic sequence of growing different crops on the same piece of land in a pre-planned successive manner to maintain soil fertility and minimize pest buildup is known as:

(A) Monoculture

(B) Intercropping

(C) Crop Rotation

(D) Mixed cropping

Q25. The acute, highly infectious zoonotic bacterial disease of livestock caused by *Bacillus anthracis*, characterized by sudden death with uncoagulated tarry dark blood discharging from natural body orifices, is:

(A) Anthrax

(B) Foot and Mouth Disease (FMD)

(C) Black Quarter (BQ)

(D) Mastitis

Q26. What is the ideal target moisture content percentage required for safely processing and storing cereal grain seeds to prevent fungal damage and respiration losses during long-term warehouse storage?

(A) 18% to 20%

(B) 10% to 12%

(C) 14% to 16%

(D) 5% to 7%

Q27. Which class of commercial flower crops is highly valued for extraction of essential oils, concrete, and is systematically categorized as a loose flower dominating the traditional garland industry in Rajasthan?

(A) Gladiolus

(B) Marigold (*Tagetes* spp.)

(C) Orchid

(D) Carnation

Q28. The age of a breeding heifer or dairy animal can be estimated with the highest precision by checking which anatomical physical feature?

(A) Length of the tail switch

(B) Appearance and development of permanent incisor teeth

(C) Size and volume of the udder quarters

(D) Thickness of the body hair coat

Q29. Which specific plant growth regulator (PGR) is widely used at commercial levels to induce uniform root formation on stem cuttings in horticultural nursery plants?

(A) Abscisic acid (ABA)

(B) Indole-3-butyric acid (IBA)

(C) Gibberellic acid (GA_3)

(D) Ethylene

Q30. The major soil order widespread across the hyper-arid and arid climatic zones of Western Rajasthan, characterized by minimal profile development and low water-holding capacity, is:

(A) Vertisols

(B) Aridisols

(C) Inceptisols

(D) Alfisols

Q31. Which type of silicious or carbohydrate-based preservation material is prepared by preserving high-moisture green forage crops under anaerobic conditions within specialized structures called silos?

(A) Hay

(B) Straw

(C) Silage

(D) Concentrates

Q32. Which breed of domestic Indian buffalo is globally recognized for producing milk with the highest fat percentage, often exceeding 12-13%, and is characterized by a copper-colored body coat?

(A) Murrah

(B) Surti

(C) Bhadawari

(D) Mehsana

Q33. In a standardized agricultural marketing supply chain, a decentralized localized rural market that operates weekly or bi-weekly in village clusters is traditionally termed as a:

(A) Terminal market

(B) Haat / Periodic market

(C) Regulated wholesale market

(D) Forward exchange market

Q34. The highly prized mushroom species characterized by button-shaped white fruiting bodies, belonging to the genus *Agaricus*, which accounts for the largest share in commercial commercial production is:

(A) Oyster mushroom

(B) Paddy straw mushroom

(C) White button mushroom (*Agaricus bisporus*)

(D) Milky mushroom

Q35. Which essential management practice involves the removal of dead, diseased, or overcrowded branches to regulate the structural form and framework of a fruit tree?

(A) Thinning

(B) Pruning

(C) Training

(D) Heading back

Q36. The scientific management process of keeping a colony of honeybees in artificial hives for the sustainable production of commercial honey and beeswax is defined as:

(A) Sericulture

(B) Apiculture

(C) Lac culture

(D) Vermiculture

Q37. Which method of milking is scientifically considered the cleanest, fastest, and most hygienic manual technique to simulate the natural suckling action of a calf without causing injury to the teat tissues?

(A) Knuckling

(B) Stripping

(C) Full-hand milking (Fisteling)

(D) Machine milking only

Q38. The system where agriculture production relies completely on natural inputs, excluding synthetic chemical fertilizers, pesticides, and growth regulators, to sustain soil health and ecological cycles is termed as:

(A) Precision farming

(B) Hydroponics

(C) Organic farming

(D) Intensive agriculture

Q39. Which major physiological disorder in mango results in the internal breakdown of the fruit pulp tissue into a soft, yellowish, sour mass without any external visual symptoms on the skin?

(A) Black tip

(B) Mango malformation

(C) Spongy tissue

(D) Fruit drop

Q40. Which of the following exotic poultry breeds belongs to the Mediterranean class and is universally renowned for its outstanding egg-laying capacity?

(A) White Leghorn

(B) Rhode Island Red

(C) Plymouth Rock

(D) Australorp

Detailed Solutions

Q1.

Solution

Concept: Livestock Breeds and Adaptation. In arid and semi-arid regions of northwestern India, indigenous cattle breeds have evolved specific physiological mechanisms to survive extreme heat, minimal water availability, and local tropical diseases.

Solution:

(a) The Tharparkar breed originated in the Tharparkar district of Pakistan and is extensively bred in the adjoining desert tracts of western Rajasthan (Jaisalmer, Barmer, and Jodhpur).

(b) It is a dual-purpose breed prized for both its resilient draft capacity and profitable milk yield under hostile, low-input desert environments.

(c) This breed possesses excellent heat tolerance due to efficient sweating mechanisms and highly reflective light-colored coats, alongside native immunity against common tick-borne tropical diseases.

(d) Exotic breeds like Holstein Friesian and Jersey lack these environmental adaptations and suffer severe climate stress in Rajasthan, while Gir is native to the semi-arid forests of Gujarat.

Final Answer: Tharparkar.

Answer: (B)

Go Back to Question 1

Q2.

Solution

Concept: Nursery Media and Substrates. High-tech plant propagation relies on soil-less substrates designed to optimize physical properties such as air-filled porosity, water-holding capacity, and structural stability.

Solution:

(a) Perlite is an amorphous volcanic glass that expands significantly when heated quickly to high temperatures, creating a lightweight, sterile, and highly porous structure.

(b) When mixed into nursery media, perlite physically prevents soil compaction, providing excellent aeration and drainage channels while holding optimal moisture within its micro-cavities.

(c) Unlike organic amendments such as coco peat or vermicompost, perlite is completely inert, does not decompose over time, and contains no inherent plant nutrients.

(d) Clay loam is a natural soil class that easily compacts in container systems, which severely restricts root oxygenation compared to engineered soil-less volcanic substrates.

Final Answer: Perlite.

Answer: (A)

Go Back to Question 2

Q3.

Solution

Concept: Tillage Mechanics and Soil Management. Continuous superficial cultivation or heavy machinery traffic often creates a dense, compacted subsoil layer known as a hardpan, which restricts root penetration and water infiltration.

Solution:

(a) A subsoiler, or heavy-duty chisel plow, is a specialized deep tillage implement designed to operate at depths well below the standard plow layer to shatter compacted pans.

(b) Its narrow, vertical tines slice cleanly through tough subsurface layers using purely compressive fracturing forces without lifting or inverting the lower horizons.

(c) Traditional primary tillage tools like the disc plow are built to invert the topsoil completely, which leaves lower hardpans largely undisturbed.

(d) Secondary tillage implements like rotavators and harrows manipulate only the upper few inches of soil to create fine seedbeds and eliminate emerging weeds.

Final Answer: Subsoiler (Chisel plow).

Answer: (B)

Go Back to Question 3

Q4.

Solution

Concept: Plant Nutrition and Deficiency Symptoms. Plant nutrients are categorized by their cellular mobility, which directly determines where visual deficiency symptoms first manifest when supply falls below critical levels.

Solution:

(a) Phosphorus is a highly mobile element within the plant vascular system, allowing the crop to readily translocate reserves from older leaves upward to developing apical meristems.

(b) When phosphorus is deficient, old leaves accumulate excess anthocyanin pigments due to disrupted sugar metabolism, which creates a distinct purple or bronze coloration.

(c) Phosphorus is vital for energy transfer via adenosine triphosphate (ATP); its absence halts cellular division, leading to stunted roots and delayed crop maturity.

(d) Nitrogen deficiency instead causes general chlorosis (yellowing) of older leaves, while potassium deficiency causes characteristic marginal scorching along the outer leaf borders.

Final Answer: Phosphorus.

Answer: (C)

Go Back to Question 4

Q5.

Solution

Concept: Methods of Plant Breeding. Crop improvement strategies rely on exploiting genetic variation through selection, hybridization, introduction, or induced mutations based on the target crop's reproductive biology.

Solution:

(a) Selection methods isolate superior genotypes from variable base populations; mass selection specifically chooses visually superior individuals to pool their seed for the next generation.

(b) The term 'clonal selection' applies strictly to vegetatively propagated crops, while 'mass selection' and 'pure-line selection' are standard methods used to improve self-pollinated crops.

(c) Hybridization involves the controlled crossing of genetically distinct parents to produce a new F1 generation, which is separate from simple population selection.

(d) Mutation breeding uses physical or chemical mutagens to alter DNA sequences directly, creating brand-new alleles rather than sorting through preexisting genetic variation.

Final Answer: Selection Methods.

Answer: (C)

Go Back to Question 5

Q6.

Solution

Concept: Cultivation of Medicinal Plants. Arid farming networks leverage highly specialized medicinal crops that thrive under low rainfall and provide high-value active ingredients for pharmaceutical use.

Solution:

(a) Isabgol, scientifically named *Plantago ovata*, is a valuable winter cash crop grown extensively across the dry, sandy soils of western and southern Rajasthan.

(b) The commercial economic value of Isabgol lies entirely in the translucent, mucilaginous husk layer that surrounds the seed coat, which is separated through mechanical milling.

(c) This natural husk functions as an effective bulk-forming laxative due to its high water-absorption capacity and dietary fiber content.

(d) Ashwagandha yields medicinal roots rich in withanolides, Guggal provides an oleo-gum-resin via stem incision, and Safed Musli is grown for its fleshy, saponin-rich fascicled roots.

Final Answer: Isabgol (*Plantago ovata*).

Answer: (A)

Go Back to Question 6

Q7.

Solution

Concept: Agricultural Credit and Institutional Support. Institutional credit systems are structured to provide farmers with flexible financial liquidity, preventing dependence on informal, high-interest moneylenders.

Solution:

(a) The Kisan Credit Card (KCC) scheme acts as a revolving cash credit facility, allowing farmers to draw and repay funds repeatedly based on their land holdings and cropping patterns.

(b) This operational structure helps farmers meet immediate operating expenses, such as buying seeds and fertilizers, handling post-harvest logistics, and supporting domestic consumption.

(c) Term loans are rigid, non-renewable credits reserved for purchasing long-term capital assets like tractors, micro-irrigation systems, or farm buildings.

(d) The KCC system does not function as a fixed, non-callable real estate mortgage, prioritizing instead production flexibility and easy access to working capital.

Final Answer: Revolving cash credit facility.

Answer: (B)

Go Back to Question 7

Q8.

Solution

Concept: Physiological Disorders in Horticultural Crops. Nutritional disorders often arise from localized translocational failures within rapidly growing tissues rather than an outright absence of elements in the soil.

Solution:

(a) Calcium is an immobile element inside plant tissues, moving almost exclusively through the transpiration stream via xylem vessels toward actively transpirating leaves.

(b) Rapidly expanding organs with low transpiration rates, such as developing fruit tips, often suffer from localized calcium deficiencies during hot, dry periods.

(c) This localized lack of calcium compromises cell wall integrity, causing cell membranes to collapse and forming sunken, necrotic lesions like blossom end rot or bitter pit.

(d) Boron deficiency primarily alters meristematic growth zones, while magnesium deficiency causes interveinal chlorosis in older leaves because it is a central component of chlorophyll.

Final Answer: Calcium.

Answer: (C)

Go Back to Question 8

Q9.

Solution

Concept: Orchard Layout and Planting Systems. Selecting an orchard layout design determines long-term plant density, ease of mechanical inter-cultivation, and overall solar radiation interception.
Solution:

(a) The quincunx system, also called the filler system, follows the standard square layout but places an additional, temporary filler tree in the center of each square unit.

(b) This configuration increases initial plant density by roughly 15

(c) Short-lived, fast-growing fruit crops like papaya, kinnow, or phalsa are typically selected as fillers and are removed once the primary fruit trees require the full space.

(d) The hexagonal system accommodates 15

Final Answer: Quincunx system.

Answer: (B)
Go Back to Question 9

Q10.

Solution

Concept: Dairy Chemistry and Milk Quality Testing. Physical parameters of milk, including density and specific gravity, fluctuate predictably with temperature variations, requiring strict calibration during diagnostic testing.
Solution:

(a) A lactometer measures the specific gravity of raw milk to detect potential water adulteration, and its internal scale is calibrated to a standard reference temperature.

(b) The universally accepted reference temperature for standard lactometer verification is 27°C (80°F) in India, or 15.5°C (60°F) on Western scales.

(c) If testing occurs at a different temperature, technicians must apply a mathematical correction factor to the observed reading to ensure accuracy.

(d) A temperature of 4°C is used for chilled milk storage to stop bacterial growth, while 40°C is used to liquefy fats before conducting specific volumetric tests.

Final Answer: 27°C or 60°F.

Answer: (B)
Go Back to Question 10

Q11.

Solution

Concept:

Biogas Technology and Bio-waste Management. Anaerobic digestion involves a complex cascade of biochemical conversions managed by distinct groups of microorganisms functioning in environments completely devoid of molecular oxygen.

Solution:

(a) A typical continuous-run biogas plant features separate functional zones designed to manage the sequential biochemical phases: liquefaction, acidogenesis, acetogenesis, and methanogenesis.

(b) The digester tank is the primary enclosed airtight chamber where biological organic matter undergoes systematic anaerobic breakdown by highly specialized methane-producing archaebacteria.

(c) These methanogenic microbes process volatile fatty acids and acetate compounds into biogas, a combustible combination of methane and carbon dioxide gases.

(d) In contrast, the inlet tank simply acts as a physical mixing zone for raw dung and water slurry, the gas holder functions as a temporary storage dome, and the outlet tank collects processed bio-slurry.

Final Answer: Digester tank.

Answer: (C)

Go Back to Question 11

Q12.

Solution

Concept:

Agricultural Meteorology and Climatology. Atmospheric phenomena are scientifically analyzed and classified into distinct scalar dimensions based on their geographical coverage area and temporal duration.

Solution:

(a) Weather is defined as the physical state of the lower atmosphere at a specific point in time and over a local geographical area, measured through changing properties like temperature and humidity.

(b) These atmospheric parameters fluctuate dynamically over short spans, typically following hourly, daily, or localized weekly patterns that directly influence immediate agricultural operations.

(c) Conversely, climate represents the long-term statistical aggregate of these atmospheric conditions, requiring standardized observations over a minimum reference period of thirty consecutive years.

(d) A microclimate refers to the specialized atmospheric variations modified within a very localized canopy layer, whereas an agro-ecological zone describes a major geographic region defined by uniform macroclimatic limits.

Final Answer: Weather.

Answer: (B)

Go Back to Question 12

Q13.

Solution

Concept:

Methods of Plant Breeding and Genetics. Introgressing specific target genes from uncultivated wild accessions into adapted elite lines requires specialized breeding procedures designed to split close linkage traps.

Solution:

(a) The backcross method serves as a highly precise breeding technique designed to transfer a single, easily identifiable trait from a donor parent into an otherwise excellent agronomic recurrent parent.

(b) By crossing the hybrid progeny repeatedly back to the recurrent parent line, breeders systematically recover the entire genetic makeup of the commercial cultivar while keeping the specific donor gene intact.

(c) This approach is highly effective for modifying self-pollinated crops with oligogenic traits like monogenic disease resistance, as it minimizes genetic drag from unadapted wild relatives.

(d) Conversely, alternative systems like mass selection work by selecting multiple variable phenotypes at once, while pedigree and bulk methods focus on developing entirely new genetic lines from early segregating generations.

Final Answer: Backcross method.

Answer: (B)

Go Back to Question 13

Q14.

Solution

Concept:

Avian Pathology and Poultry Management. Highly contagious viral diseases present major economic risks to poultry operations, requiring precise pathological diagnosis to implement effective biosecurity measures.

Solution:

(a) Ranikhet disease, globally recognized as Newcastle Disease, is an acute avian respiratory, nervous, and gastrointestinal disorder caused by a highly contagious avian paramyxovirus-1 infection.

(b) This pathogen spreads rapidly through poultry flocks, causing severe respiratory distress, green diarrhea, distinct twisting of the neck, coordination loss, and high mortality rates.

(c) The disease was named Ranikhet after the geographic area in India where this destructive viral condition was first identified and clinically documented in poultry flocks.

(d) Other common diseases are distinctly different: Fowl Pox causes scabby lesions on unfeathered skin, Coccidiosis is caused by protozoan parasites in the digestive tract, and Chronic Respiratory Disease is a bacterial infection.

Final Answer: Ranikhet disease.

Answer: (A)

Go Back to Question 14

Q15.

Solution

Concept:

Post-Harvest Management of Horticultural Crops. Perishable commodities undergo quick physiological decline immediately after harvest, requiring rapid physical intervention to slow down metabolic deterioration.

Solution:

(a) Pre-cooling is an essential primary post-harvest practice that involves rapidly drawing out stored sensible heat from freshly harvested fruits and vegetables before transport or storage.

(b) Lowering the internal tissue temperature immediately after harvest slows down the cellular respiration rate, minimizes metabolic weight loss, and suppresses ethylene-driven ripening processes.

(c) Rapid thermal reduction also prevents spore germination of opportunistic fungal pathogens on vulnerable skin surfaces, significantly extending the marketable shelf life of perishable crops.

(d) In comparison, blanching is a thermal process used to inactivate internal enzymes prior to freezing, curing helps thicken root skins, and waxing applies a surface barrier to limit moisture loss.

Final Answer: Pre-cooling.

Answer: (B)

Go Back to Question 15

Q16.

Solution

Concept:

Seed Physiology and Technology. Successful crop establishment relies on seed viability and germination processes, which are governed by internal genetic traits and external environmental conditions.

Solution:

(a) Seed dormancy is a physiological adaptation where viable seeds fail to initiate germination even when placed under completely optimal moisture, temperature, and oxygen conditions.

(b) This condition is caused by internal factors such as thick seed coats, the presence of chemical germination inhibitors like abscisic acid, or physiologically immature embryos.

(c) Dormancy functions as an evolutionary survival mechanism that prevents seeds from germinating during unseasonable periods, allowing them to remain viable in the soil seed bank until favorable growth conditions return.

(d) Mechanical scarification and cold stratification are specialized techniques used to break this dormancy, whereas seed viability simply indicates whether the internal embryo is alive.

Final Answer: Seed Dormancy.

Answer: (C)

Go Back to Question 16

Q17.

Solution

Concept:

Soil Fertility and Organic Manures. Organic amendments are classified into bulky and concentrated categories based on their relative dry matter content, carbon-to-nitrogen ratio, and elemental nutrient percentage.

Solution:

(a) Concentrated organic manures are manufactured from organic manufacturing byproducts like oilseeds, animal bone meal, or slaughterhouse waste, and they contain high amounts of major plant nutrients per unit weight.

(b) Groundnut cake is an edible oil cake byproduct that contains a high concentration of essential plant macronutrients, typically providing around 7.3

(c) Bulky organic manures like farmyard manure (FYM), rural compost, and green manures contain low percentages of actual nutrients wrapped in large volumes of organic matter.

(d) While bulky manures are excellent for improving soil structure and water retention, concentrated cakes supply readily available mineral nutrients to fast-growing crops.

Final Answer: Groundnut cake.

Answer: (A)

Go Back to Question 17

Q18.

Solution

Concept:

Irrigation Systems and Water Engineering. Modern micro-irrigation systems optimize crop water productivity by minimizing transport, evaporation, and deep percolation losses in arid environments.

Solution:

(a) Drip irrigation, also known as trickle irrigation, achieves high water-use efficiency (ranging from 90

(b) This system applies water directly to the immediate crop root zone through specialized emitters, keeping the surrounding inter-row soil dry and reducing unnecessary evaporation losses.

(c) By maintaining soil moisture near field capacity without saturation, drip systems reduce deep percolation losses and prevent weed growth between crop rows.

(a) In comparison, overhead sprinkler systems are prone to evaporation and wind drift losses, while surface methods like furrow or border strips lose considerable water to deep percolation.

Final Answer: Drip irrigation.

Answer: (B)

Go Back to Question 18

Q19.

Solution

Concept:

Agricultural History and Dairy Economics. National development programs use cooperative structural frameworks to link smallholder rural producers directly with urban consumer markets.

Solution:

(a) Operation Flood, launched in 1970 by the National Dairy Development Board (NDDB) under the leadership of Dr. Verghese Kurien, stands as the largest dairy development program in history.

(b) The primary objective of this program was to build a national milk grid linking small-scale rural dairy producers with major urban liquid milk markets across India.

(c) By eliminating exploitative intermediaries, the program ensured fair pricing for rural farmers while funding investments in animal nutrition, veterinary care, and artificial insemination.

(d) This initiative transformed India from a milk-deficient nation into the world's leading milk producer, establishing the cooperative dairy model known as the White Revolution.

Final Answer: Establish a nationwide milk grid to increase dairy production and rural incomes.

Answer: (C)

Go Back to Question 19

Q20.

Solution

Concept:

Food Processing and Post-Harvest Chemistry. Chemical preservatives work by changing internal cell membrane permeability or disrupting metabolic enzymes to prevent the growth of spoilage microorganisms.

Solution:

(a) Potassium metabisulphite (KMS) is a widely used chemical preservative that releases sulfur dioxide (SO_2) gas when mixed with acidic fruit juices.

(b) The released sulfur dioxide forms sulfurous acid in solution, which exerts strong antimicrobial action against spoilage yeast, molds, and aerobic bacteria while preserving the fruit's natural color.

(c) KMS is used for light-colored or colorless fruit products like grapes, guavas, and lemon squashes because its bleaching action does not affect the appearance of these juices.

(d) Sodium benzoate is preferred for deep-colored juices like tomato, plum, or jamun because sulfur dioxide would bleach and ruin their natural anthocyanin pigments.

Final Answer: Potassium metabisulphite (KMS).

Answer: (B)

Go Back to Question 20

Q21.

Solution

Concept:

Viticulture Canopy Management. Training systems for commercial grapevines are selected based on the vigor of the specific cultivar, regional climate, economic scale, and the mechanical requirements for effective pruning and fruit harvesting.

Solution:

(a) The Bower system, traditionally termed the Pergola or Arbour system, is a highly popular canopy management technique implemented for commercial grape cultivation in highly productive tropical regions.

(b) This system establishes a rigid overhead network of wires supported by concrete columns, upon which the primary vine arms are evenly distributed across a horizontal plane.

(c) By maintaining the entire vegetative mass on this overhead trellis, it maximizes the total leaf surface area exposed to solar radiation, significantly increasing photosynthesis and overall fruit yield.

(d) Other designs like the Kniffin and Telephone systems distribute canes vertically or along semi-vertical wires, while the Head system keeps the vine growing upright like a bush without wire support.

Final Answer: Bower / Pergola system.

Answer: (A)

Go Back to Question 21

Q22.

Solution

Concept:

Weed Ecology and Parasitism. Obligate root parasites establish specialized biological connections with host root systems, directly drawing water, carbohydrates, and essential mineral nutrients from the host vascular tissue.

Solution:

(a) *Orobanche*, widely known as broomrape, is an aggressive, non-chlorophyllous obligate root holoparasite that attacks crops belonging to the Solanaceae and Brassicaceae families.

(b) In the agricultural landscapes of Rajasthan, this weed poses a severe threat to winter mustard crops by using specialized root structures called haustoria to penetrate host tissues.

(c) These haustoria plug directly into the host xylem and phloem, starving the mustard plant of vital moisture and nutrients, which causes severe wilting, stunting, and massive crop yield losses.

(d) In comparison, *Cuscuta* is a stem holoparasite that infests lucerne, *Striga* is a partial root parasite affecting sorghum and pearl millet, and *Loranthus* is a partial stem parasite commonly found on woody fruit trees.

Final Answer: *Orobanche* (Broomrape).

Answer: (B)

Go Back to Question 22

Q23.

Solution

Concept:

Arid Pomology and Cultivation. Developing successful orchards in hyper-arid zones requires selecting fruit species with distinct physical adaptations, such as deep taproots and thick leaf cuticles, to withstand severe water stress.

Solution:

(a) Ber, scientifically classified as *Ziziphus mauritiana* and often called the desert apple, is an exceptionally hardy indigenous fruit tree well-adapted to the hot, dry plains of western Rajasthan.

(b) This crop features a deep, aggressive taproot system that can pull moisture from deep subsoil layers, and its thick, waxy leaves reduce moisture loss from transpiration.

(c) It also enters a natural dormancy phase during the peak heat of summer by shedding its leaves, which protects the tree when water resources are lowest.

(d) Ber tolerates high soil salinity and alkalinity better than most fruit crops, whereas tropical choices like banana and papaya need consistent water and high humidity to survive.

Final Answer: Ber (*Ziziphus mauritiana*).

Answer: (C)

Go Back to Question 23

Q24.

Solution

Concept:

Cropping Systems and Agronomy. Sustainable soil management uses planned sequences of different crops to optimize nutrient use across different depths of the soil profile.

Solution:

(a) Crop rotation is the systematic practice of growing a planned sequence of different crops on the same piece of land over successive farming seasons.

(b) This technique typically rotates deep-rooted crops with shallow-rooted ones to maintain good soil structure, and alternates heavy nutrient-feeding cereals with nitrogen-fixing legumes.

(c) Interrupting continuous monoculture with a diverse crop rotation breaks the reproductive lifecycles of specialized soil-borne pathogens, insect pests, and persistent weeds.

(d) In contrast, monoculture refers to growing the same single crop year after year, while intercropping and mixed cropping involve cultivating multiple crops simultaneously in the same field.

Final Answer: Crop Rotation.

Answer: (C)

Go Back to Question 24

Q25.

Solution

Concept:

Veterinary Bacteriology and Livestock Health. Acute infectious livestock diseases caused by spore-forming bacteria require rapid diagnosis and strict quarantine measures to prevent wide-scale environmental contamination.

Solution:

(a) Anthrax is a severe, acute zoonotic disease caused by the large, rod-shaped, spore-forming bacterium known as *Bacillus anthracis*.

(b) The disease is characterized by sudden death in livestock, accompanied by dark, uncoagulated, tarry blood discharging from natural body openings like the nose, mouth, and anus.

(c) This lack of clotting occurs because the bacteria produce dangerous toxins that destroy blood platelets and damage endothelial cell walls throughout the circulatory system.

(d) Due to the extreme stability of anthrax spores in the environment, veterinary regulations strictly forbid opening the carcass of a suspected animal to prevent spreading the pathogen into the surrounding soil.

Final Answer: Anthrax.

Answer: (A)

Go Back to Question 25

Q26.

Solution

Concept:

Seed Storage Technology and Physiology. Controlling internal seed moisture content is the most critical factor for limiting biochemical degradation, mold development, and insect activity during warehouse storage.

Solution:

(a) Cereal grain seeds must be dried to a safe moisture threshold of 10

(b) Keeping moisture within this critical range significantly slows down the seed's internal respiration rate, preserving stored carbohydrates and maintaining high seed embryo viability.

(c) This dry environment also prevents the growth of storage molds, such as *Aspergillus* species, and stops destructive warehouse pests like the rice weevil from reproducing.

(d) Storing grains with moisture levels above 14% causes rapid heat buildup from intense seed metabolism, leading to mold damage, spoilage, and a severe drop in seed germination rates.

Final Answer: 10% to 12%.

Answer: (B)

Go Back to Question 26

Q27.

Solution

Concept:

Commercial Floriculture and Processing. The commercial value of ornamental flowers depends on their post-harvest classification as either cut flowers with long stems for vases, or loose flowers used for garlands and oil extraction.

Solution:

(a) Marigold, belonging to the genus *Tagetes*, is a popular, hardy commercial flower crop grown extensively throughout the diverse agro-climatic zones of Rajasthan.

(b) It is classified as a loose flower because individual flower heads are harvested without stems, dominating the traditional local market for making religious garlands, festival decorations, and floral offerings.

(c) Marigold blooms are also processed on an industrial scale to extract essential oils and lutein pigments, which are widely used as natural colorants in the food and poultry feed industries.

(d) In comparison, flowers like gladiolus, orchids, and carnations are grown as premium cut flowers, valued for their long, straight stems and long vase life in modern floral arrangements.

Final Answer: Marigold (*Tagetes* spp.).

Answer: (B)

Go Back to Question 27

Q28.

Solution

Concept:

Livestock Evaluation and Age Determination. Accurately estimating the age of farm animals is essential for determining their market value, breeding schedules, and optimal nutritional requirements.

Solution:

(a) Examining the development, eruption, and wear patterns of the permanent incisor teeth provides the most precise method for estimating the age of cattle, buffalo, sheep, and goats.

(b) Ruminants lack incisors on their upper jaw, featuring a tough dental pad instead, but they have eight incisors on the lower jaw that follow a highly predictable eruption timeline.

(c) Temporary milk teeth are systematically replaced by pairs of larger permanent incisors as the animal matures, allowing inspectors to gauge age by counting these permanent teeth.

(d) While physical markers like tail length or hair coat thickness change due to environment and nutrition, dentition patterns remain a reliable biological timeline for age verification.

Final Answer: Appearance and development of permanent incisor teeth.

Answer: (B)

Go Back to Question 28

Q29.

Solution

Concept:

Plant Growth Regulators in Propagation. Applying synthetic auxins to stem cuttings alters the local hormonal balance at the base of the cutting, triggering rapid cell differentiation into adventitious roots.

Solution:

(a) Indole-3-butyric acid (IBA) is a highly effective synthetic growth regulator belonging to the auxin family, used extensively in commercial nurseries to encourage rooting in stem cuttings.

(b) IBA speeds up root development by stimulating cell division in the cambium tissue, redirecting undifferentiated cells to form organized adventitious root initials.

(c) It is preferred over other auxins because it remains stable against light degradation and stays localized near the point of application, reducing the risk of plant injury.

(d) In contrast, gibberellic acid (GA_3) is used to break seed dormancy and elongate cells, abscisic acid acts as a stress hormone that inhibits growth, and ethylene promotes fruit ripening.

Final Answer: Indole-3-butyric acid (IBA).

Answer: (B)

Go Back to Question 29

Q30.

Solution

Concept:

Soil Taxonomy and Regional Pedology. Soil classification groups profiles into broad structural orders based on distinct diagnostic horizons formed by regional climate, parent material, and weathering patterns.

Solution:

(a) Aridisols are the dominant soil order spanning the vast, hyper-arid and semi-arid desert terrains of western Rajasthan, covering over half of the state's total land area.

(b) These desert soils develop in climates with long dry periods, which limits chemical weathering and results in minimal soil profile development.

(c) Aridisols are typically sandy, contain very little organic matter, and have low water-holding capacity, often featuring subsurface accumulations of calcium carbonate known as caliche.

(d) Looking at other orders, Vertisols comprise the heavy, expansive clay soils of the southeastern Hadoti region, while Alfisols and Inceptisols are found in the semi-humid eastern plains.

Final Answer: Aridisols.

Answer: (B)

Go Back to Question 30

Q31.

Solution

Concept:

Forage Preservation Technology. Conserving high-moisture green fodder during periods of abundance ensures a steady supply of nutritious livestock feed during dry or lean seasons.

Solution:

(a) Silage is a high-moisture forage product prepared by packing fresh, green crops into airtight structures called silos under highly compacted conditions.

(b) The tightly packed environment excludes oxygen, enabling native lactic acid bacteria to convert plant sugars into organic acids, mainly lactic acid, through anaerobic fermentation.

(c) This continuous microbial production of lactic acid lowers the storage environment's pH to around 3.8 to 4.2, which naturally inhibits spoilage organisms and preserves the nutritional quality of the forage.

(d) Green crops rich in soluble carbohydrates, such as maize, sorghum, and pearl millet, are excellent choices for producing high-quality silage.

(e) In comparison, hay is produced by sun-drying green forage to reduce its moisture below 15

Final Answer: Silage.

Answer: (C)

Go Back to Question 31

Q32.

Solution

Concept:

Bubaline Breeds and Milk Composition. Different domestic buffalo breeds exhibit unique genetic adaptations, physical features, and variations in milk component synthesis.

Solution:

(a) The Bhadawari buffalo breed is native to the Bhadawar estate along the Yamuna and Chambal river ravines, spanning parts of Uttar Pradesh and Madhya Pradesh.

(b) This breed is distinguished by its copper-colored or light-yellowish body coat and two white lines called chevrons on the lower side of the neck.

(c) It is renowned for its unique milk quality, producing a high average fat content that regularly reaches 12

(d) This exceptional fat concentration makes the breed valuable for producing high-quality ghee, even when managed under low-input rural scavenging conditions.

(e) Looking at other options, the Murrah breed is known for its high liquid milk yield and tightly coiled horns, the Surti features sickle-shaped horns, and the Mehsana is a crossbreed.

Final Answer: Bhadawari.

Answer: (C)

Go Back to Question 32

Q33.

Solution

Concept:

Agricultural Marketing and Rural Economics. Agricultural markets are classified into distinct structural tiers based on their geographic location, transaction frequency, and position in the supply chain.

Solution:

(a) A Haat, or periodic market, is a decentralized rural market that operates on a weekly or bi-weekly schedule within village clusters across India.

(b) These temporary retail hubs allow smallholder farmers to sell their surplus produce directly to local consumers or assembly traders without relying on permanent commercial infrastructure.

(c) These gatherings provide a convenient space for rural households to buy essential consumer goods, farming tools, and household provisions close to home.

(d) In comparison, terminal markets are large urban hubs located at the end of the supply chain, while regulated wholesale markets operate out of permanent, state-managed facilities under APMC rules.

Final Answer: Haat / Periodic market.

Answer: (B)

Go Back to Question 33

Q34.

Solution

Concept:

Commercial Mushroom Cultivation. Edible fungi species are selected for large-scale commercial production based on consumer demand, standard substrate availability, and temperature management requirements.

Solution:

(a) The white button mushroom, known scientifically as *Agaricus bisporus*, is the most widely cultivated and commercially consumed mushroom species across India and the globe.

(b) It features a distinct white, dome-shaped cap attached to a thick stem, and it grows best on pasteurized compost mixtures under controlled temperature and humidity conditions.

(c) This species accounts for over 70

(d) Other varieties include the oyster mushroom (*Pleurotus* spp.), which is easy to grow on straw substrates, and the heat-tolerant paddy straw and milky mushrooms, which require warmer cultivation temperatures.

Final Answer: White button mushroom (*Agaricus bisporus*).

Answer: (C)

Go Back to Question 34

Q35.

Solution

Concept:

Orchard Management and Canopy Dynamics. Maintaining high fruit productivity requires regular physical interventions to optimize sunlight penetration, remove non-productive tissue, and manage internal air circulation.

Solution:

(a) Pruning is an essential management practice that involves the selective removal of dead, diseased, pest-infested, or overcrowded branches from a mature fruit tree.

(b) This practice helps direct the plant's metabolic energy away from excess vegetative growth and toward productive fruiting zones, improving overall fruit size and quality.

(c) Open structures created by pruning allow more sunlight to reach the inner canopy and lower branches, which increases photosynthesis and encourages uniform fruit ripening.

(d) In contrast, training is performed during the early years of a tree's life to establish its main skeletal framework, thinning removes excess young fruit to reduce crop load, and heading back shortens branches to encourage side growth.

Final Answer: Pruning.

Answer: (B)

Go Back to Question 35

Q36.

Solution

Concept:

Economic Entomology and Allied Agriculture. Raising beneficial insects under managed conditions allows farmers to diversify their income streams and improve crop pollination rates.

Solution:

(a) Apiculture is the scientific management and rearing of honeybee colonies, typically using manageable artificial hives, to harvest honey, beeswax, propolis, and royal jelly.

(b) The practice relies on key domesticated species like *Apis mellifera* and *Apis cerana indica*, which are kept in structured apiaries where their health and honey production can be monitored.

(c) Beyond providing direct income from honey sales, managed bees act as vital pollinators for surrounding oilseed, pulse, and horticultural crops, significantly increasing regional harvest yields.

(d) Looking at other practices, sericulture involves rearing silkworms for raw silk production, lac culture harvests natural resin from lac insects, and vermiculture focuses on breeding earthworms for organic compost production.

Final Answer: Apiculture.

Answer: (B)

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Q37.

Solution

Concept:

Milking Hygiene and Udder Health. Implementing correct manual milking techniques is essential for maximizing milk let-down while protecting the delicate internal structures of the teat.

Solution:

(a) Full-hand milking, also referred to as fisting, is recognized as the most hygienic and effective manual milking technique for dairy cattle and buffaloes with medium to large teats.

(b) This method involves grasping the base of the teat with the thumb and index finger to prevent milk from flowing back into the udder, then closing the remaining fingers sequentially to extract the milk.

(c) This technique distributes pressure evenly along the length of the teat, mimicking the natural suckling action of a calf without stretching or damaging the internal tissues.

(d) In contrast, knuckling involves bending the thumb against the teat, which applies concentrated, uneven pressure that can cause internal tissue damage and lead to mastitis infections.

(e) Stripping is used primarily for small-teated animals or to draw out the last fat-rich drops of milk at the end of a milking session.

Final Answer: Full-hand milking (Fisteling).

Answer: (C)

Go Back to Question 37

Q38.

Solution

Concept:

Sustainable Agriculture and Ecology. Alternative farming practices minimize environmental footprints by relying on natural biological cycles and organic soil amendments rather than synthetic agrochemicals.

Solution:

(a) Organic farming is a comprehensive production management system that avoids the use of synthetic chemical fertilizers, chemical pesticides, weedicides, and artificial growth regulators.

(b) This system focuses on maintaining soil health by applying organic inputs like farmyard manure, vermicompost, green manures, and biofertilizers to nourish soil microbes.

(c) It uses natural cultural practices like crop rotation, companion planting, and biological pest controls to manage weed populations and suppress crop diseases.

(d) In comparison, precision farming uses satellite technology to optimize resource application, hydroponics grows plants without soil using nutrient-rich water solutions, and intensive agriculture relies on heavy chemical inputs to maximize immediate crop yields.

Final Answer: Organic farming.

Answer: (C)

Go Back to Question 38

Q39.

Solution

Concept:

Post-Harvest Disorders in Fruit Crops. Internal physiological disorders can occur in mature fruits due to metabolic imbalances or environmental stresses during development, even without showing outward signs of damage.

Solution:

(a) Spongy tissue is a major physiological disorder that affects mango varieties, particularly the popular commercial cultivar Alphonso.

(b) This condition is characterized by an internal breakdown of the fruit pulp into a soft, yellowish, sour mass, which is often accompanied by air pockets but leaves the outer skin looking completely normal.

(c) The disorder is triggered by high convective heat radiating from the hot ground surface up into the tree canopy as the fruit approaches maturity, which disrupts internal ripening enzymes.

(d) In comparison, black tip is caused by exposure to toxic gases like sulfur dioxide from nearby brick kilns, mango malformation is a complex floral disorder, and fruit drop describes the premature shedding of young fruit.

Final Answer: Spongy tissue.

Answer: (C)

Go Back to Question 39

Q40.

Solution

Concept:

Avian Breeds and Production Classification. Exotic poultry breeds are grouped into distinct geographic classes based on their region of origin, body shape, physical characteristics, and production strengths.

Solution:

(a) The White Leghorn is an exotic chicken breed that belongs to the Mediterranean class, tracing its origins back to the coastal regions of Italy.

(b) This breed features a lightweight, wedge-shaped body, white plumage, large single combs, and white earlobes, and it is known for its efficient feed conversion ratio.

(c) It is globally recognized for its exceptional egg-laying capacity, often producing over 300 white-shelled eggs per year, making it a cornerstone breed for commercial egg operations.

(d) Looking at other options, Rhode Island Red and Plymouth Rock belong to the American class and are raised as dual-purpose birds for both meat and eggs, while the Australorp belongs to the English class.

Final Answer: White Leghorn.

Answer: (A)

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Answer Key

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