Rajasthan JET Agriculture Sample Paper-11

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 mark**.
- Use of mobile phones, smartwatches, calculators, or any electronic gadgets is strictly prohibited.

Q1. Which clay mineral, owing to its 2:1 expanding lattice, shows the highest shrink–swell behaviour and the greatest cation exchange capacity?

(A) Kaolinite, a 1:1 non-expanding mineral

(B) Illite, a 2:1 mineral with potassium fixed between layers

(C) Montmorillonite (smectite), a 2:1 expanding mineral that swells on wetting and cracks on drying

(D) Halloysite, a hydrated 1:1 tubular mineral

Q2. Which micronutrient is an essential structural component of both the nitrogenase enzyme of nitrogen-fixing bacteria and the nitrate reductase enzyme of higher plants?

(A) Molybdenum

(B) Manganese

(C) Copper

(D) Chlorine

Q3. The plant-available water of a soil is the moisture held between which two soil-moisture constants?

(A) Saturation and field capacity (the gravitational water)

(B) Field capacity and permanent wilting point

(C) Permanent wilting point and the oven-dry condition

(D) Hygroscopic coefficient and the air-dry state

Q4. The primary purpose of applying agricultural lime to a strongly acidic soil is to:

(A) Further acidify the soil to release fixed phosphorus

(B) Supply nitrogen and potassium directly to the crop

(C) Improve aeration by increasing the proportion of macropores

(D) Neutralise soil acidity, raise pH, reduce aluminium and manganese toxicity, and supply calcium

Q5. Neem-coated urea improves nitrogen-use efficiency mainly because the neem triterpenes act as a:

(A) Nitrification inhibitor that slows the microbial conversion of ammonium to nitrate, reducing leaching and denitrification losses

(B) Nitrogen-fixing biofertilizer that adds atmospheric nitrogen to the soil

(C) Chelating agent that increases micronutrient availability

(D) Plant growth hormone that stimulates root proliferation

Q6. Sprinkler irrigation is particularly well suited to:

(A) Heavy clay soils with very low infiltration rates

(B) Levelled basins used for puddled rice

(C) Sandy soils with high infiltration rates and undulating topography where surface methods waste water

(D) Saline soils where salts must be leached downward by ponding

Q7. Conservation agriculture rests on three core principles. Which combination correctly represents them?

(A) Deep ploughing, residue burning, and continuous monocropping

(B) Minimum soil disturbance, permanent soil cover with residues, and crop diversification or rotation

(C) Flood irrigation, heavy fertilisation, and intensive tillage

(D) Prolonged bare fallow, repeated harrowing, and removal of all residues

Q8. Azolla is used as a biofertilizer in rice because it harbours, in its leaf cavities, the symbiotic nitrogen-fixing cyanobacterium:

(A) Rhizobium leguminosarum

(B) Azospirillum brasilense

(C) Frankia alni

(D) Anabaena azollae

Q9. Among the rabi cereals, which crop is the most salt-tolerant and is widely grown for malt and animal feed on the saline tracts of Rajasthan?

(A) Barley

(B) Bread wheat

(C) Oat

(D) Rice

Q10. Taramira (*Eruca sativa*) is favoured by farmers in the driest parts of Rajasthan because it:

(A) Is a high water-requiring oilseed needing assured irrigation

(B) Is an extremely drought-hardy oilseed that can be sown late on conserved soil moisture with minimal inputs

(C) Is a kharif legume that fixes atmospheric nitrogen

(D) Is a long-duration spice crop grown only under polyhouse

Q11. Cowpea (*Vigna unguiculata*) is valued in arid farming systems mainly because it:

(A) Is an oilseed crop grown for edible oil extraction

(B) Is a cereal fodder that does not fix any nitrogen

(C) Is a long-duration rabi pulse intolerant of heat

(D) Is a quick-growing legume serving simultaneously as a pulse, fodder, and green manure while fixing atmospheric nitrogen

Q12. Young sorghum (jowar) fodder, especially regrowth after drought, can be toxic to livestock because it accumulates:

(A) Excess nitrate only, with no other toxic principle

(B) Oxalic acid that binds calcium in the rumen

(C) The cyanogenic glycoside dhurrin, which releases hydrocyanic (prussic) acid on enzymatic breakdown

(D) Gossypol, a polyphenolic pigment

Q13. Linseed (*Linum usitatissimum*) is a rabi crop grown for both oil and fibre. The stem fibre obtained from it is commercially known as:

(A) Flax (linen) fibre

(B) Jute fibre

(C) Mesta fibre

(D) Sunn hemp fibre

Q14. Lucerne (alfalfa, *Medicago sativa*) is called the "queen of forages" chiefly because it:

(A) Is an annual cereal fodder that must be re-sown after every cut

(B) Is a deep-rooted perennial legume yielding many high-protein cuttings over three to four years while fixing nitrogen

(C) Is a short-duration kharif oilseed

(D) Contains toxic alkaloids and is grown only as a cover crop

Q15. Custard apple (sitaphal, *Annona squamosa*) is well suited to the rocky, marginal lands of Rajasthan because it:

(A) Requires deep fertile soil and heavy assured irrigation

(B) Is a cool-temperate fruit needing winter chilling

(C) Can be multiplied only through tissue culture

(D) Is a hardy, drought-tolerant tree that thrives on shallow rocky soils with little irrigation and can be raised from seed

Q16. Commercial date palm orchards are increasingly raised from tissue-cultured plants rather than offshoots because tissue culture:

(A) Produces seedlings of unpredictable sex and fruit quality

(B) Is far cheaper than offshoots but gives non-uniform plants

(C) Rapidly multiplies large numbers of disease-free, true-to-type, uniform female clones, overcoming the very limited natural supply of offshoots

(D) Yields dwarfing rootstocks for high-density planting only

Q17. Carrot and radish are cool-season root vegetables. For well-coloured, well-formed roots they require:

(A) Cool temperatures during root development; high temperature causes poor colour, forking, and excessive pungency

(B) Hot, humid conditions throughout root growth

(C) Continuously waterlogged soil for tender roots

(D) Strict short-day photoperiod regardless of temperature

Q18. In marigold (*Tagetes*) cultivation, "pinching" (removal of the terminal growing tip) is practised to:

(A) Induce a single large terminal bloom for cut-flower use

(B) Promote lateral branching and increase the number of flowers per plant

(C) Control sucking insect pests on the shoot tip

(D) Permanently dwarf the plant for pot culture only

Q19. Coriander (*Coriandrum sativum*, dhania), a major seed-spice of the Kota–Jhalawar belt, is distinctive among spice crops because:

(A) Only its underground root is used as the spice

(B) Only its dried flowers are commercially valuable

(C) It is propagated vegetatively by stem cuttings

(D) Both its fresh foliage (leafy herb) and its dry split fruits ("seeds") are commercially valuable

Q20. Mound (stool) layering is a vegetative propagation method best suited for:

(A) Tall, single-stemmed forest timber trees

(B) Annual vegetable crops grown from seed

(C) Clonal rootstocks of fruit plants such as apple, guava, and quince, whose cut-back shoots are earthed up to root at their bases

(D) Submerged aquatic ornamental plants

Q21. Applying an edible wax coating to harvested fruits such as apple and citrus chiefly helps to:

(A) Reduce transpirational water loss and respiration, giving longer shelf life and improved surface gloss

(B) Accelerate ripening so the fruit can be sold sooner

(C) Add vitamins and minerals to the fruit flesh

(D) Sterilise the internal tissue and kill systemic pathogens

Q22. Hydroponics is best defined as the practice of:

(A) Growing plants in heavily manured, deeply ploughed field soil

(B) Growing plants in a balanced nutrient solution without using soil

(C) Grafting a scion onto a water-rooted stock plant

(D) Storing harvested produce in a controlled-humidity cold room

Q23. Cytoplasmic male sterility (CMS) is exploited in commercial hybrid seed production because it:

(A) Doubles the chromosome number of the female parent

(B) Induces seed formation without fertilisation (apomixis)

(C) Provides a pollen-sterile female line, eliminating the costly manual emasculation otherwise needed to prevent self-pollination

(D) Converts the hybrid directly into a pure homozygous line

Q24. Doubled haploid lines produced by anther culture followed by chromosome doubling are valuable in breeding because they:

(A) Generate highly heterozygous F_1 hybrid vigour

(B) Reliably induce useful point mutations in the genome

(C) Produce sterile triploids useful for seedless fruit

(D) Achieve complete (100%) homozygosity in a single step, greatly shortening the time to develop pure lines

Q25. Under India's seed regulatory system, "truthfully labelled seed" differs from "certified seed" in that truthfully labelled seed:

(A) Carries the blue certification tag of the State Seed Certification Agency

(B) Is marketed under the Seeds Act 1966 on the seller's own guarantee of the declared minimum standards, without third-party field and laboratory certification

(C) Belongs to the highest genetic-purity class produced by the breeder

(D) Cannot legally be sold to farmers in any state

Q26. The conservation of crop genetic diversity as seeds stored at low temperature and low humidity in a gene bank is an example of:

(A) Ex-situ conservation in a seed gene bank, such as at NBPGR, New Delhi

(B) In-situ conservation of wild populations in their natural habitat

(C) On-farm conservation by continuous cultivation of landraces

(D) Cryo-grafting of dormant scion wood onto rootstocks

Q27. White grubs (*Holotrichia* spp.), a serious pest of groundnut and other kharif crops in Rajasthan, damage the crop by:

(A) Boring into the stem and causing a dead heart

(B) Sucking sap from the leaves and transmitting a virus

(C) Feeding on roots underground as grubs, causing sudden wilting and death of plants, while the adult beetles emerge with the first monsoon rains and defoliate trees at night

(D) Mining serpentine tunnels within the leaf lamina

Q28. Mealybugs (for example *Phenacoccus solenopsis* on cotton) are recognised as sucking pests by:

(A) The chewing damage and shot-holes they make on leaves

(B) Their soft, white, powdery wax-covered bodies that suck plant sap and excrete honeydew, encouraging sooty mould

(C) The grubs that bore into developing fruits and bolls

(D) The serpentine mines they create inside leaves

Q29. The red flour beetle (*Tribolium castaneum*), a major pest of stored milled products, is best described as a:

(A) Primary pest that bores into and develops within sound whole grain

(B) Field pest that attacks the standing crop before harvest

(C) Sap-sucking pest of stored pulses

(D) Secondary stored-product pest that infests flour, broken grains, and processed cereals, being unable to attack sound whole grain

Q30. Karnal bunt of wheat, caused by *Tilletia indica*, is significant mainly because it:

(A) Destroys every grain in the ear, causing total yield loss

(B) Is a foliar rust that defoliates the crop before grain filling

(C) Partially converts grains to a black powdery mass with a foul fishy (trimethylamine) odour and is an important quarantine pest restricting wheat export

(D) Attacks only the roots, causing seedling damping-off

Q31. Late blight of potato, historically responsible for the Irish famine, is caused by:

(A) *Alternaria solani*, the early blight fungus

(B) *Ralstonia solanacearum*, a soil-borne bacterium

(C) *Fusarium oxysporum*, a vascular wilt fungus

(D) The oomycete *Phytophthora infestans*, favoured by cool, humid weather, producing water-soaked lesions with white downy growth on leaf margins

Q32. *Beauveria bassiana* is used in biological pest control as a/an:

(A) Entomopathogenic fungus ("white muscardine") that infects and kills a wide range of insect pests

(B) Bacterial biopesticide similar to *Bacillus thuringiensis*

(C) Insect virus (nuclear polyhedrosis virus) sprayed on larvae

(D) Parasitoid wasp that lays eggs inside pest eggs

Q33. Which statement correctly describes the Red Sindhi, one of India's best indigenous dairy cattle breeds?

(A) It is a white-coated draught breed of south India used only for ploughing

(B) It is a red-coated, heat-tolerant zebu milch breed (originating in the Sindh region) extensively used in tropical crossbreeding for milk

(C) It is an exotic European breed introduced for high fat content

(D) It is a hornless dual-purpose hill breed reared mainly for manure

Q34. Among Indian buffalo breeds, the Nili-Ravi is distinctively identified by:

(A) Its jet-black body, tightly curled horns, and absence of any white markings

(B) Its very short stature and exclusive use as a draught animal

(C) Its red coat and tolerance of saline desert water

(D) Its "walled" (blue-white) eyes and white "panchkalyan" markings on the face and legs, being a high-yielding river buffalo of the Ravi belt

Q35. The Jaisalmeri sheep breed of western Rajasthan is best known for:

(A) Producing fine apparel wool comparable to Merino

(B) Being a high milk-yielding dairy sheep breed

(C) Being a hardy desert breed producing superior carpet wool and adapted to long-distance migration over the arid Thar

(D) Being a hornless breed reared exclusively for mutton in humid zones

Q36. Mastitis in dairy animals is:

(A) Inflammation of the udder (mammary gland), commonly of bacterial origin, screened early by the California Mastitis Test and causing clots or flakes in milk and heavy economic loss

(B) A calcium-deficiency disorder occurring soon after calving

(C) A viral disease producing blisters on the feet and mouth

(D) A reproductive disorder causing repeat breeding

Q37. The AGMARK seal on an agricultural commodity in India indicates that the product:

(A) Has been certified as organically grown without chemicals

(B) Has been graded and quality-certified under the Agricultural Produce (Grading and Marking) Act, administered by the Directorate of Marketing and Inspection

(C) Is exempt from market fee and taxes in regulated mandis

(D) Is a genetically modified product approved for sale

Q38. The Soil Health Card Scheme, launched in 2015, provides each farmer with:

(A) Free crop-insurance cover against natural calamities

(B) A subsidised short-term credit card for buying inputs

(C) A periodic report of the soil's nutrient status (N, P, K, micronutrients), pH, EC, and organic carbon, with crop-wise fertiliser and amendment recommendations

(D) An official record of land ownership and irrigation rights

Q39. The Food Corporation of India (FCI) maintains a buffer stock of foodgrains primarily to:

(A) Export surplus grain in the international market for profit

(B) Fix the minimum support price for each crop season

(C) Operate the regulated wholesale mandis across the country

(D) Procure grain at the minimum support price and hold buffer stocks for distribution through the PDS and for price stabilisation during shortages

Q40. The Training and Visit (T&V) system of agricultural extension was characterised by:

(A) A rigid fortnightly schedule of training village extension workers and their fixed-day visits to contact farmers under a single line of command

(B) Farmer-led participatory appraisal replacing all formal extension staff

(C) Reliance only on mass media such as radio and television, with no field staff

(D) Unscheduled, demand-based visits with no regular training of staff

Detailed Solutions

Q1.

Solution

Silicate clay minerals are built from sheets of silicon-oxygen tetrahedra and aluminium-oxygen octahedra. The ratio of these sheets defines the mineral type and behaviour.

Comparison of the main clay minerals:

Mineral	Type	Expanding?	CEC (cmol/kg)
Kaolinite	1:1	No	3–15
Illite	2:1 (K fixed)	No	15–40
Montmorillonite	2:1	Yes	80–150

Why montmorillonite swells and shrinks:

- Its 2:1 layers are held together only by weak forces, allowing water and cations to enter the interlayer space
- On wetting it swells; on drying it shrinks, producing the deep cracks typical of black cotton (Vertisol) soils
- The large internal surface area and high isomorphous substitution give it the highest cation exchange capacity

Why the other options are wrong: Kaolinite and halloysite are 1:1 non-expanding minerals with low CEC; illite is 2:1 but the interlayer potassium locks the lattice so it does not expand. **Final Answer:** Montmorillonite, a 2:1 expanding clay, shows the greatest shrink–swell behaviour and the highest cation exchange capacity.

Answer: (C) Go Back to Q1

Q2.

Solution

Molybdenum (Mo) is required by plants in the smallest quantity of all the essential micronutrients, yet it is indispensable to nitrogen metabolism.

Two key Mo-dependent enzymes:

- **Nitrogenase:** the enzyme of *Rhizobium* and free-living N-fixers that reduces atmospheric N_2 to ammonia; its active site contains an iron–molybdenum cofactor (FeMo-co)

- **Nitrate reductase:** the plant enzyme that reduces absorbed nitrate (NO_3^-) to nitrite, the first step in assimilating nitrate-N

Deficiency symptoms: "whiptail" of cauliflower (distorted, strap-like leaves) and poor nodulation in legumes. Mo availability *increases* with rising pH, the opposite of most micronutrients.

Why the other options are wrong: Manganese activates photosynthetic water-splitting; copper is part of plastocyanin and oxidases; chlorine is involved in the Hill reaction and osmoregulation. None is the cofactor of both nitrogenase and nitrate reductase. **Final Answer:** Molybdenum is the micronutrient common to nitrogenase and nitrate reductase, linking both biological nitrogen fixation and nitrate assimilation.

Answer: (A) Go Back to Q2

Q3.

Solution

Soil water is held at different tensions, and only part of it can actually be used by crops.

The soil-moisture constants:

- **Saturation:** all pores filled with water
- **Field capacity (FC):** water retained after gravitational (free) water has drained, at about -0.33 bar (1/3 atmosphere)
- **Permanent wilting point (PWP):** the moisture content at which a plant wilts and cannot recover, at about -15 bar
- **Hygroscopic coefficient / oven-dry:** water held so tightly it is unavailable

Available water:

$$\text{Available Water} = \text{Field Capacity} - \text{Permanent Wilting Point}$$

Water above field capacity drains away as gravitational water before the plant can use it; water below the wilting point is held too tightly for roots to extract. Hence only the moisture between FC and PWP is plant-available.

Why the other options are wrong: (A) is gravitational water that drains away; (C) and (D) describe unavailable water held below the wilting point. **Final Answer:** Plant-available water is the moisture held between field capacity and the permanent wilting point.

Answer: (B) Go Back to Q3

Q4.

Solution

Acid soils (pH below about 5.5) suffer from aluminium and manganese toxicity, phosphorus fixation, and poor activity of beneficial microbes.

What liming does:

- Liming materials (agricultural lime $CaCO_3$, dolomite $CaMg(CO_3)_2$, or quicklime CaO) react with soil acidity
- The carbonate neutralises hydrogen ions: $CaCO_3 + 2H^+ \rightarrow Ca^{2+} + H_2O + CO_2$
- Soil pH rises toward neutrality, precipitating toxic Al^{3+} as insoluble hydroxide
- Phosphorus becomes more available, and Ca (and Mg from dolomite) is supplied as a nutrient
- Nodulation of legumes and the activity of nitrifying bacteria improve

Lime requirement is the quantity of liming material needed to raise the soil to a target pH, judged from soil pH, texture, and buffering capacity.

Why the other options are wrong: liming raises pH rather than acidifying (A); it does not supply N or K (B); its main effect is chemical neutralisation, not aeration (C). **Final Answer:** Lime is applied to neutralise soil acidity, raise pH, reduce aluminium and manganese toxicity, and supply calcium.

Answer: (D) Go Back to Q4

Q5.

Solution

When urea is applied to soil it is rapidly hydrolysed to ammonium, which soil bacteria then oxidise to nitrate (nitrification). Nitrate is very mobile and is easily lost by leaching and denitrification, lowering nitrogen-use efficiency.

Role of the neem coating:

- Neem seed contains triterpenoids (azadirachtin, nimbin, salannin) that coat the urea prills

- These compounds slow the activity of *Nitrosomonas* bacteria, the first step of nitrification (ammonium → nitrite)
- Nitrogen therefore stays longer in the ammonium form, which is held on the soil exchange complex and resists leaching
- This synchronises nitrogen release with crop demand, raising efficiency and reducing losses

Government significance: India mandated neem-coating of all urea to curb diversion to industry and improve field efficiency.

Why the other options are wrong: neem does not fix nitrogen (B), is not a micronutrient chelator (C), and is not a growth hormone (D); its proven field role here is as a nitrification inhibitor. **Final Answer:** Neem-coated urea acts as a nitrification inhibitor, slowing the conversion of ammonium to nitrate and reducing nitrogen losses.

Answer: (A) Go Back to Q5

Q6.

Solution

The suitability of an irrigation method depends on soil infiltration, topography, and water availability.

Why sprinkler irrigation suits sandy, undulating land:

- In sandy soils with high infiltration, surface (flood/furrow) irrigation loses huge amounts of water to deep percolation; a sprinkler applies water slowly as simulated rain, matching the infiltration rate
- On undulating or sloping land that cannot be levelled for surface irrigation, sprinklers distribute water uniformly without land levelling
- Application can be controlled to avoid runoff and erosion

Main components: pump, mainline and laterals, riser pipes, and rotating sprinkler heads (nozzles).

Why the other options are wrong: heavy clay with very low infiltration leads to surface ponding and is poorly suited (A); levelled rice basins use surface flooding (B); leaching of salts is done by ponding/flooding, not overhead sprinkling (D). **Final Answer:** Sprinkler irrigation is best suited to sandy soils of high infiltration and to undulating topography where surface methods would waste water.

Answer: (C) Go Back to Q6

Q7.

Solution

Conservation agriculture (CA) is a resource-saving system that maintains long-term productivity while protecting the soil.

The three interlinked principles of CA:

(a) **Minimum mechanical soil disturbance:** zero or reduced tillage, with seeding directly into untilled soil, preserving soil structure and biota

(b) **Permanent soil cover:** retaining crop residues or growing cover crops, which conserves moisture, moderates temperature, and suppresses weeds

(c) **Crop diversification:** sensible rotations and associations that break pest and disease cycles and improve soil fertility

Benefits: reduced erosion, higher soil organic carbon, better water infiltration, lower fuel and labour costs, and improved climate resilience – highly relevant for the resource-poor arid zones.

Why the other options are wrong: (A), (C), and (D) all describe conventional, soil-degrading practices (burning residues, intensive tillage, bare fallow) that are the opposite of conservation agriculture. **Final Answer:** Conservation agriculture is built on minimum soil disturbance, permanent residue cover, and crop diversification/rotation.

Answer: (B) Go Back to Q7

Q8.

Solution

Azolla is a small free-floating freshwater fern used as a biofertilizer, especially in lowland rice.

The symbiosis:

- Azolla harbours the nitrogen-fixing cyanobacterium *Anabaena azollae* within cavities in its leaves
- *Anabaena* fixes atmospheric nitrogen using specialised cells (heterocysts); the fixed nitrogen becomes available to rice when the Azolla decomposes
- An Azolla cover can add roughly 25–40 kg N per hectare per crop and also

suppresses weeds and conserves water

Use in rice: Azolla is either grown as a dual crop with rice or incorporated as a green manure before transplanting.

Why the other options are wrong: *Rhizobium* nodulates legume roots; *Azospirillum* is an associative free-living fixer of cereals; *Frankia* fixes nitrogen in non-legume actinorhizal plants such as *Casuarina*. None is the Azolla symbiont. **Final Answer:** The nitrogen-fixing partner inside Azolla is the cyanobacterium *Anabaena azollae*.

Answer: (D) Go Back to Q8

Q9.

Solution

Among the cool-season cereals, barley (*Hordeum vulgare*) is the hardiest under stress.

Why barley suits saline Rajasthan tracts:

- It is the most salt-tolerant of the common cereals, yielding reasonably even where wheat fails on saline-sodic soils
- It also tolerates drought and marginal fertility, fitting the low-input rainfed and saline conditions of western Rajasthan
- Its grain is used for malt (brewing and malt foods) and as nutritious animal and poultry feed

Relative salt tolerance of cereals: barley $>$ wheat $>$ oat $>$ rice (rice is among the most sensitive at the seedling stage).

Why the other options are wrong: wheat and oat are appreciably less salt-tolerant than barley; rice is salt-sensitive and water-demanding, unsuited to saline arid tracts. **Final Answer:** Barley is the most salt-tolerant rabi cereal and is widely grown for malt and feed on Rajasthan's saline lands.

Answer: (A) Go Back to Q9

Q10.

Solution

Taramira (*Eruca sativa*), also called rocket-salad or arugula, is a minor rabi oilseed of the mustard family especially important in the most marginal arid zones.

Why arid-zone farmers grow it:

- It is exceptionally drought-hardy and can be sown late, even on conserved residual soil moisture, when it is too dry to risk mustard
- It needs very few inputs and tolerates poor, light soils, giving an assured small return where other crops fail
- Its pungent oil is used as a lubricant, in pickles, and (after refining) for cooking; the cake is used as feed and manure

Why the other options are wrong: taramira is the opposite of a high water-requiring crop (A); it is a rabi oilseed, not a kharif legume (C); it is field-sown in the open, not a polyhouse spice crop (D). **Final Answer:** Taramira is an extremely drought-hardy, low-input oilseed sown on residual moisture in the driest parts of Rajasthan.

Answer: (B) Go Back to Q10

Q11.

Solution

Cowpea (*Vigna unguiculata*), locally lobia or chawla, is a versatile warm-season legume of dryland farming.

Why it is valued in arid systems:

- It is quick-growing and drought-tolerant, fitting short rainy spells
- Being a legume, it fixes atmospheric nitrogen in root nodules with *Rhizobium*, enriching the soil
- It is genuinely multi-purpose: tender pods and grain as pulse (food/feed), leafy biomass as nutritious fodder, and the whole crop as an excellent green manure
- Its quick ground cover smothers weeds and protects light soils from erosion

Why the other options are wrong: cowpea is not an oilseed (A); it is a legume that fixes nitrogen, not a non-fixing cereal fodder (B); it is a short-duration warm-season crop, not a heat-intolerant long-duration rabi pulse (C). **Final Answer:**

Cowpea is a quick-growing, nitrogen-fixing legume that serves at once as pulse, fodder, and green manure in arid farming.

Answer: (D) Go Back to Q11

Q12.

Solution

Sorghum (jowar) is a valuable fodder, but young or stressed plants carry a serious poisoning risk to livestock.

The toxic principle:

- Sorghum tissue contains the cyanogenic glycoside **dhurrin**
- When the plant is chewed or damaged, the enzyme breaks dhurrin down to release **hydrocyanic (prussic) acid, HCN**
- HCN blocks cellular respiration (cytochrome oxidase), and animals can die rapidly of cyanide poisoning
- Dhurrin is highest in young plants, in fresh regrowth after a cut, and in drought- or frost-stressed crops

Safe-feeding practice: feed sorghum fodder only after it is about 50–60 cm tall or at the flowering stage; avoid grazing young regrowth and stressed crops; making hay or silage lowers HCN.

Why the other options are wrong: nitrate accumulation is a separate, secondary risk but not the classic toxin here (A); oxalate and gossypol problems belong to other plants (B, D). **Final Answer:** Young sorghum fodder is dangerous because it accumulates the cyanogenic glycoside dhurrin, which releases prussic (hydrocyanic) acid.

Answer: (C) Go Back to Q12

Q13.

Solution

Linseed (*Linum usitatissimum*), called alsi, is a dual-purpose rabi crop, with different types selected for oil (linseed) or for fibre (flax).

The fibre:

- The bast (phloem) fibre extracted from the stem is **flax**, which is spun into **linen** cloth – one of the oldest textile fibres known

- Fibre-type varieties are tall and sparsely branched; oil-type varieties are short and bushy with more capsules
- The seed yields linseed oil, a drying oil used in paints, varnishes, and printing inks; it is also rich in omega-3 (alpha-linolenic acid)

Why the other options are wrong: jute comes from *Corchorus*; mesta from *Hibiscus*; sunn hemp from *Crotalaria juncea*. None is obtained from linseed. **Final Answer:** The stem fibre of linseed is flax, used to make linen, while the seed yields linseed (drying) oil.

Answer: (A) Go Back to Q13

Q14.

Solution

Lucerne (alfalfa, *Medicago sativa*) is one of the most important cultivated forage legumes and is traditionally titled the "queen of forages".

Why it earns that title:

- It is a deep-rooted **perennial** legume that, once established, yields for three to four years (or more) under irrigation
- It gives **many cuttings** per year (often 6–8 under good management), each rich in protein, calcium, and carotene
- Being a legume, it fixes atmospheric nitrogen and improves soil fertility
- Its deep taproot draws moisture and nutrients from lower soil layers, making it productive even in semi-arid irrigated tracts

Why the other options are wrong: lucerne is a perennial that need not be resown after each cut (A); it is a prized, non-toxic protein fodder, not a mere cover crop (D); it is a rabi-establishing perennial legume, not a kharif oilseed (C). **Final Answer:** Lucerne is the "queen of forages" because it is a deep-rooted perennial legume giving many high-protein cuttings over several years while fixing nitrogen.

Answer: (B) Go Back to Q14

Q15.

Solution

Custard apple (sitaphal, *Annona squamosa*) is a hardy subtropical fruit ideally matched to Rajasthan's poor lands.

Why it suits marginal arid land:

- It is highly drought-tolerant and survives on shallow, rocky, gravelly soils where most fruit crops fail
- It tolerates neglect, needs little irrigation, and even grows semi-wild on hill slopes and wastelands
- It is easily raised from seed, and bears within three to four years
- Its sweet, nutritious fruit fetches a good local price, making it a low-investment option for resource-poor farmers

Why the other options are wrong: custard apple does *not* need deep fertile soil or heavy irrigation (A); it is a warm subtropical fruit, not a cool-temperate one needing chilling (B); it is mainly seed-propagated and is not restricted to tissue culture (C). **Final Answer:** Custard apple is a hardy, drought-tolerant tree that thrives on shallow rocky soils with little irrigation, making it well suited to Rajasthan's marginal lands.

Answer: (D) Go Back to Q15

Q16.

Solution

Date palm (*Phoenix dactylifera*) is naturally propagated by offshoots (suckers) that arise at the base of the mother palm, but their number is very limited.

Advantages of tissue-cultured date palms:

- A single elite female palm can be multiplied into thousands of identical, **true-to-type** plants, which seed propagation cannot do (seedlings segregate and half turn out to be low-value males)
- The plants are **disease-free** and uniform, giving an even orchard that flowers and fruits together
- It overcomes the severe shortage of offshoots, allowing rapid large-scale orchard establishment

Relevance: this has enabled new date orchards in the hot arid zone of Rajasthan

(e.g. Jaisalmer, Bikaner) using imported tissue-cultured varieties such as Barhee and Medjool.

Why the other options are wrong: seedlings (not tissue culture) give unpredictable sex (A); tissue culture is costlier per plant but gives uniform, not non-uniform, plants (B); it produces full female fruiting palms, not dwarf rootstocks (D). **Final Answer:** Tissue culture rapidly multiplies large numbers of disease-free, true-to-type female date palms, overcoming the limited supply of offshoots.

Answer: (C) Go Back to Q16

Q17.

Solution

Carrot (*Daucus carota*) and radish (*Raphanus sativus*) are cool-season root vegetables in which temperature strongly controls root quality.

Why cool temperatures are essential:

- Best root development, colour, and flavour occur at roughly 15–21°C
- Under high temperature, carrot roots develop poor (pale) colour and become short and coarse, while radish turns excessively **pungent** and woody and may **fork** or bolt prematurely
- Cool weather also favours the accumulation of carotene (orange colour) in carrot

Agronomic note: both are sown directly (taproots do not transplant well) on light, deep, loose soil free of stones, which would otherwise cause forking.

Why the other options are wrong: hot humid conditions spoil root quality (B); waterlogging causes rot and poor roots (C); root formation here is governed mainly by temperature, not a strict short-day requirement (D). **Final Answer:** Carrot and radish need cool temperatures during root growth; high temperature causes poor colour, forking, and excessive pungency.

Answer: (A) Go Back to Q17

Q18.

Solution

Marigold is the most popular loose-flower crop, grown for garlands, religious use, and the extraction of carotenoid pigment.

Purpose of pinching:

- Pinching is the removal of the terminal (apical) growing tip of the young plant
- It breaks apical dominance, releasing the side buds so the plant develops more lateral branches
- More branches mean more flowering shoots and therefore a higher number of flowers per plant and a higher total yield
- It also makes the plant bushier and sturdier

Timing: usually done about three to four weeks after transplanting, when the plant has several pairs of leaves.

Why the other options are wrong: pinching increases branching and flower number rather than forcing a single bloom (A); it is a training practice, not a pest-control measure (C); it does not permanently dwarf the plant and is used for field crops, not only pots (D). **Final Answer:** Pinching the terminal tip of marigold promotes lateral branching and increases the number of flowers per plant.

Answer: (B) Go Back to Q18

Q19.

Solution

Coriander (*Coriandrum sativum*, dhania) is a major seed-spice crop, and Rajasthan (the Kota–Jhalawar–Baran belt) is a leading producer.

What makes it distinctive:

- It is a **dual-use** crop: the fresh tender foliage is sold as the leafy herb ("green coriander/dhania patta") used in cooking and chutneys, and the mature dried split fruits (the so-called "seeds") are the seed-spice used whole or ground
- Thus a single crop supplies both a green vegetable-herb and a dry condiment, often from staggered sowings
- The dried fruit and its volatile oil (linalool-rich) are also used in flavouring

and medicine

Why the other options are wrong: the root is not the commercial product (A); the flowers themselves are not the spice (B); coriander is grown from seed, not vegetative cuttings (C). **Final Answer:** Coriander is distinctive because both its fresh leaves and its dry fruits ("seeds") are commercially valuable.

Answer: (D) Go Back to Q19

Q20.

Solution

Layering is a propagation method in which roots are induced on a stem while it is still attached to the parent plant. Mound (stool) layering is one specific type.

Mound (stool) layering procedure:

- The mother plant is cut back (headed back) close to the ground during the dormant season to force many new shoots
- As the new shoots grow, soil is heaped (mounded) over their bases progressively
- The covered bases form roots; the rooted shoots are then separated in the next dormant season and planted out

Where it is used: for clonal multiplication of **fruit-plant rootstocks** that root readily, such as clonal apple rootstocks (the Malling/MM series), quince, guava, and currants.

Why the other options are wrong: it is unsuited to tall single-stemmed timber trees (A) and to seed-grown annual vegetables (B); it is a soil-mounding technique on land, not for aquatic plants (D). **Final Answer:** Mound (stool) layering is used mainly to multiply clonal rootstocks of fruit plants such as apple, guava, and quince by earthing up cut-back shoots until they root at the base.

Answer: (C) Go Back to Q20

Q21.

Solution

Waxing is an important post-harvest treatment in which a thin edible coating of food-grade wax (such as carnauba or shellac-based wax) is applied to fruit.

How wax coating extends shelf life:

- It restores and supplements the natural wax bloom that is removed during washing and handling
- The coating reduces **transpiration (water loss)**, so the fruit stays firm and does not shrivel
- It forms a partial barrier to gas exchange, slowing **respiration** and ripening
- It gives the fruit an attractive **glossy** appearance, improving marketability

Common use: apple, citrus (orange, kinnow), and many other fruits are waxed before storage and marketing; fungicide is sometimes incorporated into the wax.

Why the other options are wrong: waxing slows, not accelerates, ripening (B); it does not add nutrients (C); it is a surface coating and does not sterilise the internal flesh or kill systemic pathogens (D). **Final Answer:** An edible wax coating mainly reduces water loss and respiration, extending shelf life and improving gloss.

Answer: (A) Go Back to Q21

Q22.

Solution

Hydroponics is a method of soilless cultivation.

Definition and principle:

- Plants are grown with their roots in (or fed by) a balanced **nutrient solution** containing all essential mineral elements in soluble form, **without soil**
- An inert medium (gravel, perlite, rockwool, cocopeat) may support the roots, or the roots may hang directly in solution
- Because nutrients, pH, and water are precisely controlled, growth can be fast and uniform; it saves water and land and avoids soil-borne diseases

Common systems: nutrient film technique (NFT), deep flow, and drip-fed bag culture; it is widely used for high-value greenhouse vegetables and is useful in water-scarce regions.

Why the other options are wrong: (A) is conventional soil culture, the opposite of hydroponics; (C) describes grafting; (D) describes cold storage. Note that aeroponics (misting roots in air) is a related but distinct soilless technique. **Final Answer:** Hydroponics is the growing of plants in a balanced nutrient solution without soil.

Answer: (B) Go Back to Q22

Q23.

Solution

Producing hybrid seed requires that the female (seed) parent be prevented from self-pollinating so that it is fertilised only by the chosen male parent. Cytoplasmic male sterility (CMS) achieves this genetically.

How CMS works:

- CMS is inherited through the cytoplasm (mitochondrial genes); a CMS female line produces no viable pollen
- Because the female line cannot self, the breeder need not remove anthers by hand – **costly manual emasculation is eliminated**
- A maintainer (B) line keeps the CMS line going, and a restorer (R) line carrying fertility-restoring genes is used as the male so that the F_1 hybrid sets normal seed/grain

Use: the CMS–maintainer–restorer (three-line) system is standard for hybrid seed of crops such as bajra, sorghum, sunflower, and rice.

Why the other options are wrong: CMS does not double chromosomes (A), does not cause apomixis (B), and does not by itself make a homozygous pure line (D); its role is to provide a pollen-sterile female. **Final Answer:** CMS provides a pollen-sterile female line, removing the need for expensive hand emasculation in hybrid seed production.

Answer: (C) Go Back to Q23

Q24.

Solution

A doubled haploid (DH) is a plant produced by doubling the chromosome number of a haploid, giving an instantly homozygous individual.

How DH lines are made and why they help:

- Anther (or microspore) culture regenerates **haploid** plants from pollen
- Treating these haploids with colchicine doubles the chromosomes, restoring the normal (diploid) number
- Every gene locus then carries two identical alleles, so the line is **100% homozygous in a single step**
- Conventional inbreeding needs six to eight selfing generations to approach this level; DH technology compresses that to essentially one generation, greatly speeding up pure-line and variety development

Use: widely applied in wheat, rice, barley, and maize breeding and in fixing recombinants quickly.

Why the other options are wrong: DH lines are homozygous, not heterozygous hybrids (A); the method is not for inducing mutations (B); it produces fertile homozygous diploids, not sterile triploids (C). **Final Answer:** Doubled haploids achieve complete homozygosity in one step, drastically shortening the time needed to develop pure breeding lines.

Answer: (D) Go Back to Q24

Q25.

Solution

India's seed quality system recognises certified seed and truthfully labelled (TL) seed, which differ in the degree of official control.

Truthfully labelled seed:

- It is sold under the **Seeds Act 1966** with a label declaring the minimum standards (germination, purity); the seller/producer **guarantees the truth of that label**
- There is **no third-party field inspection or certification** by a State Seed Certification Agency
- It is legal to sell and is the bulk of seed in the market, but quality assurance

rests on the seller's declaration rather than on independent certification

Certified seed, by contrast, is produced under the supervision and field/lab inspection of the certification agency and carries the blue (azure) tag.

Why the other options are wrong: the blue certification tag and highest genetic purity belong to certified/breeder classes, not TL seed (A, C); TL seed is perfectly legal to sell (D). **Final Answer:** Truthfully labelled seed is marketed under the Seeds Act 1966 on the seller's own guarantee of the labelled standards, without third-party certification.

Answer: (B) Go Back to Q25

Q26.

Solution

Conservation of plant genetic resources is broadly of two kinds: in-situ (in the natural habitat) and ex-situ (away from the habitat).

Seed gene bank = ex-situ conservation:

- Storing seeds of crops and their wild relatives in a gene bank under **low temperature (-18 to -20°C) and low humidity** is **ex-situ** conservation
- In India this is led by the **NBPGR (National Bureau of Plant Genetic Resources), New Delhi**, which maintains the National Gene Bank
- Orthodox seeds survive for decades to centuries under such conditions; recalcitrant species are kept as field gene banks or by cryopreservation/tissue culture

Why the other options are wrong: in-situ conservation keeps species in the wild (B) and on-farm conservation grows landraces in farmers' fields (C) – both are the opposite of cold-store seed banking; cryo-grafting (D) is not a conservation category. **Final Answer:** Storing seeds in a cold, dry gene bank such as NBPGR is ex-situ conservation of crop genetic diversity.

Answer: (A) Go Back to Q26

Q27.

Solution

White grubs (*Holotrichia* spp., family Scarabaeidae), called "safed lat", are among the most destructive soil pests of the kharif season in Rajasthan, badly affecting groundnut, pearl millet, and many other crops.

Nature of the damage:

- The **grub (larva)** lives in the soil and feeds voraciously on roots and underground stems
- Affected plants suddenly wilt, yellow, and die, often in expanding patches; plants pull out easily because the roots are eaten away
- The **adult beetles** emerge from the soil with the first heavy monsoon showers and feed at night on the foliage of trees such as *Acacia*, neem, and ber, returning to the soil to lay eggs

Management: light traps to catch emerging beetles, soil application/seed treatment with recommended insecticides, deep summer ploughing to expose grubs, and avoiding raw organic manure that attracts egg-laying.

Why the other options are wrong: stem boring with dead heart (A), sap sucking with virus transmission (B), and leaf mining (D) are damage types of entirely different pests. **Final Answer:** White grubs damage crops as soil-dwelling larvae feeding on roots and causing sudden wilting, while the adult beetles defoliate trees at night after the first monsoon rains.

Answer: (C) Go Back to Q27

Q28.

Solution

Mealybugs are soft-bodied sucking insects (Hemiptera) that have become serious pests of cotton (*Phenacoccus solenopsis*), papaya, and many ornamentals.

Identification and damage:

- The body is covered with a **white, powdery or mealy wax**, giving a cottony appearance; colonies cluster on shoots, leaf axils, and undersides
- They insert their stylets and **suck plant sap**, causing yellowing, leaf curling, stunting, and wilting
- They excrete sugary **honeydew** on which black **sooty mould** grows, reducing photosynthesis and spoiling the produce

- Ants tend and protect mealybugs in return for honeydew

Management: removing alternate weed hosts, releasing the predatory beetle *Cryptolaemus montrouzieri*, and need-based systemic insecticides plus a wetting agent to penetrate the wax.

Why the other options are wrong: chewing/shot-holes (A), fruit-boring grubs (C), and leaf mines (D) describe non-sucking pests of other groups. **Final Answer:** Mealybugs are identified by their white waxy bodies; they suck sap and excrete honeydew that promotes sooty mould.

Answer: (B) Go Back to Q28

Q29.

Solution

Stored-grain pests are classed as **primary** (able to attack sound, intact grain) or **secondary** (able to feed only on already-damaged grain, flour, and processed products).

Red flour beetle (*Tribolium castaneum*):

- It is a **secondary** pest – its mouthparts cannot bore into hard, sound whole grain
- It thrives in **flour, broken grains, milled cereal products, and grain dust**, and multiplies rapidly in flour mills and stores
- Heavy infestation imparts a pungent smell and pinkish tinge to flour (from quinone secretions), spoiling it

Contrast: the rice weevil (*Sitophilus oryzae*) and lesser grain borer are **primary** pests that bore into intact grain, often creating the damage that secondary pests such as *Tribolium* then exploit.

Why the other options are wrong: (A) describes a primary pest; (B) a field pest; (C) a sap-sucker – none fits the flour-infesting habit of *Tribolium*. **Final Answer:** The red flour beetle is a secondary stored-product pest of flour, broken grain, and processed cereals, unable to attack sound whole grain.

Answer: (D) Go Back to Q29

Q30.

Solution

Karnal bunt (partial bunt) of wheat is caused by the fungus *Tilletia indica* (*Neovossia indica*), first reported from Karnal, Haryana.

Why it is significant:

- Only **part** of each affected grain is converted to a black, powdery mass of teliospores – the infection is partial, so yield loss is usually small
- The bunted grain releases **trimethylamine**, producing a characteristic foul, **rotten-fish odour** that makes the grain unpalatable
- Its greatest importance is as a **quarantine** disease: many countries impose strict zero or near-zero tolerance, so even a low incidence can block wheat **export** consignments

Management: sowing clean/treated seed, resistant varieties, and seed treatment; spraying systemic fungicides (e.g. propiconazole) at heading in wet seasons.

Why the other options are wrong: loss is partial, not total (A); it is a smut/bunt of the grain, not a foliar rust (B); it affects the ear/grain, not the roots (D). **Final Answer:** Karnal bunt partially converts grains to a foul fishy-smelling black mass and is mainly important as a quarantine pest restricting wheat export.

Answer: (C) Go Back to Q30

Q31.

Solution

Late blight of potato is the disease that triggered the Great Irish Famine of the 1840s and remains the most feared potato disease worldwide.

Causal organism and conditions:

- It is caused by *Phytophthora infestans*, an **oomycete** (water mould), not a true fungus
- It is favoured by **cool, cloudy, humid weather** (about 10–20°C with high humidity or rain)
- Symptoms: water-soaked dark brown to black lesions on leaf tips and margins, with a **white downy sporulation** on the lower surface in moist conditions; the crop can collapse within days, and tubers rot

Management: resistant varieties, healthy seed tubers, earthing-up, and protec-

tive sprays of mancozeb followed by systemic fungicides (metalaxyl + mancozeb) when forecast conditions favour the disease.

Why the other options are wrong: *Alternaria solani* causes early blight with concentric "target" spots (A); *Ralstonia* causes bacterial wilt (B); *Fusarium* causes vascular wilt (C) – none is the late blight pathogen. **Final Answer:** Late blight of potato is caused by the oomycete *Phytophthora infestans*, which spreads rapidly in cool, humid weather.

Answer: (D) Go Back to Q31

Q32.

Solution

Beauveria bassiana is one of the most widely used microbial (fungal) biopesticides.

Mode of action:

- It is an **entomopathogenic fungus**; its spores (conidia) stick to the insect cuticle, germinate, and penetrate directly through the body wall
- The fungus then proliferates inside the body, killing the insect, after which a **white fungal growth** covers the cadaver – hence the disease is called **"white muscardine"**
- It infects a wide range of pests – whiteflies, aphids, thrips, beetles, and caterpillars – and is compatible with integrated pest management

Use: applied as a spray of conidial formulations; works best under humid conditions that favour spore germination.

Why the other options are wrong: *Bacillus thuringiensis* (B) is a bacterium, NPV (C) is a virus, and a parasitoid wasp (D) is an insect – *Beauveria* is none of these; it is a fungus. **Final Answer:** *Beauveria bassiana* is an entomopathogenic "white muscardine" fungus that infects and kills a wide range of insect pests.

Answer: (A) Go Back to Q32

Q33.

Solution

The Red Sindhi is, with Sahiwal and Gir, one of the three best dairy (milch) breeds of zebu (*Bos indicus*) cattle.

Key features:

- Coat is a deep **red** (dark red to reddish brown); the breed originated in the **Sindh** region (now in Pakistan)
- It is highly **heat- and tick-tolerant** and disease-resistant, performing well in hot, humid, and arid tropical conditions
- Average lactation yield is about 1500–2000 litres; it is valued worldwide and has been **extensively used in crossbreeding** (e.g. with Jersey/Holstein) to raise milk yield in the tropics

Why the other options are wrong: it is a red milch breed, not a white south-Indian draught breed (A); it is an indigenous zebu, not an exotic European breed (C); it is a horned milch breed, not a hornless dual-purpose hill breed (D). **Final Answer:** The Red Sindhi is a red-coated, heat-tolerant indigenous zebu milch breed (origin Sindh) widely used in tropical dairy crossbreeding.

Answer: (B) Go Back to Q33

Q34.

Solution

The Nili-Ravi is a leading riverine buffalo breed of the Indian sub-continent, originating in the Sutlej and Ravi river belt of Punjab.

Distinctive identification:

- Its hallmark is **"wall eyes"** – whitish-blue eyes due to a lack of pigment in the iris
- It typically shows white **"panchkalyan"** markings: white patches on the forehead, muzzle, and the lower parts of all four legs and the tail switch
- The body is otherwise black with small, tightly coiled horns; it is a heavy, **high milk-yielding** breed (about 1800–2500 litres per lactation)

Why the other options are wrong: the all-black, no-markings, curled-horn description fits the Murrah, not the Nili-Ravi (A); it is a large dairy buffalo, not a short draught animal (B); the red, saline-water-tolerant desert description is not a

buffalo trait at all (C). **Final Answer:** The Nili-Ravi buffalo is identified by its wall (blue-white) eyes and white panchkalyan markings, and is a high-yielding river buffalo of the Ravi belt.

Answer: (D) Go Back to Q34

Q35.

Solution

Jaisalmeri is an important sheep breed of the extreme arid western zone of Rajasthan (Jaisalmer, Barmer, and Jodhpur districts).

Key features:

- It is a **hardy desert breed**, tall and leggy, with a black or dark-brown face, well built for survival in the harsh Thar
- It is adapted to **long-distance migration** in search of grazing and water, withstanding heat and scarcity
- It yields **coarse carpet wool** of fairly good quality (used in the woollen carpet industry), and is reared for both wool and mutton

Why the other options are wrong: Indian desert sheep yield coarse carpet wool, not fine Merino-type apparel wool (A); sheep here are not dairy animals (B); Jaisalmeri is a horned arid-zone breed reared for wool and mutton, not a hornless humid-zone mutton-only breed (D). **Final Answer:** The Jaisalmeri is a hardy desert sheep producing good carpet wool and adapted to long-distance migration across the arid Thar.

Answer: (C) Go Back to Q35

Q36.

Solution

Mastitis is the single most economically damaging disease of dairy animals.

Nature of the disease:

- It is the **inflammation of the mammary gland (udder)**, most often caused by bacteria (*Staphylococcus*, *Streptococcus*, *E. coli*) entering through the teat canal under poor milking hygiene
- Clinical signs: swollen, hot, painful udder; clots, flakes, or watery/discoloured milk; reduced yield and, in severe cases, fever

- **Sub-clinical** mastitis shows no visible signs but lowers yield and raises somatic cell count; it is detected early by the **California Mastitis Test (CMT)**, a cow-side gel test

Prevention/control: clean milking, full milking-out, teat dipping, dry-cow therapy, and prompt antibiotic treatment of clinical cases.

Why the other options are wrong: milk fever is a calcium-deficiency disorder (B); foot-and-mouth disease is the viral blistering disease (C); repeat breeding is a reproductive disorder (D) – none is mastitis. **Final Answer:** Mastitis is bacterial inflammation of the udder, screened by the California Mastitis Test, causing clots in milk and major economic loss.

Answer: (A) Go Back to Q36

Q37.

Solution

Grading is the sorting of a commodity into uniform quality lots against defined standards, and AGMARK is India's official grading certification for agricultural produce.

AGMARK explained:

- "AGMARK" = **Agricultural Marking**; it certifies that a product has been **graded for quality** under the Agricultural Produce (Grading and Marking) Act, **1937**
- It is administered by the **Directorate of Marketing and Inspection (DMI)** under the Ministry of Agriculture
- Grading is based on parameters such as size, moisture, purity, and fat content, and the AGMARK seal assures the buyer of standardised quality
- Commodities commonly AGMARK-graded include ghee, butter, edible oils, spices, honey, and pulses

Why the other options are wrong: AGMARK certifies quality grade, not organic status (A) – organic produce uses the India Organic/NPOP logo; AGMARK gives no tax exemption (C) and has nothing to do with genetic modification (D). **Final Answer:** The AGMARK seal means the product has been quality-graded under the Agricultural Produce (Grading and Marking) Act through the DMI.

Answer: (B) Go Back to Q37

Q38.

Solution

The Soil Health Card (SHC) Scheme was launched by the Government of India in 2015 to promote balanced, soil-test-based fertiliser use.

What the card provides:

- A printed **report of the farmer's soil** based on laboratory analysis, giving the status of the major nutrients (**N, P, K**), secondary nutrients (S), and micronutrients (Zn, Fe, Cu, Mn, B), along with **pH, EC (salinity), and organic carbon**
- **Crop-wise recommendations** on the doses of fertilisers and soil amendments needed to correct deficiencies
- It is issued periodically (every 2–3 years) so the farmer can track changes and apply nutrients more efficiently, cutting cost and improving yield

Why the other options are wrong: crop insurance is provided under PMFBY (A); a credit card for inputs is the Kisan Credit Card (B); land-ownership records are maintained separately as land records (D) – none is the Soil Health Card. **Final Answer:** The Soil Health Card gives each farmer a periodic report of soil nutrient status, pH, EC, and organic carbon with crop-wise fertiliser recommendations.

Answer: (C) Go Back to Q38

Q39.

Solution

The Food Corporation of India (FCI), set up in 1965, is the central agency for the management of the national foodgrain economy.

Buffer stock and its purpose:

- FCI **procures** wheat and rice from farmers at the **minimum support price (MSP)**, assuring them a remunerative price
- It **stores** the grain and maintains a **buffer stock** above operational needs
- The stock is used to **supply the Public Distribution System (PDS)** and welfare schemes, and is released into the market to **stabilise prices** and meet shortages, famines, or emergencies

Buffer norms are fixed by the government for each quarter to ensure both food security and price stability.

Why the other options are wrong: FCI's primary buffer purpose is domestic food security, not profit-driven export (A); the MSP is recommended by the CACP and announced by the government, not fixed by FCI (B); regulated mandis are run by state APMCs, not FCI (C). **Final Answer:** FCI procures grain at MSP and holds buffer stocks for PDS distribution and for price stabilisation during shortages.

Answer: (D) Go Back to Q39

Q40.

Solution

The Training and Visit (T&V) system was a major extension reform introduced in India in the 1970s (promoted by Daniel Benor and the World Bank).

Defining features:

- A **single line of command**: a professional extension hierarchy devoted only to extension, free of other duties
- **Regular fortnightly training** of the village extension worker (VEW) by subject-matter specialists, keeping advice up to date
- A **fixed schedule of visits**: each VEW visited assigned groups of **contact farmers** on the same fixed day every fortnight, so farmers knew when to expect them
- Emphasis on a few timely, relevant "impact points" carried regularly to farmers

Limitation: it was top-down and costly; it was later largely replaced by participatory and decentralised models (e.g. ATMA).

Why the other options are wrong: T&V was a structured staff-based system, not farmer-led PRA replacing staff (B); it relied on field visits, not mass media alone (C); its hallmark was a rigid fixed schedule, not unscheduled visits (D). **Final Answer:** The T&V system featured a rigid fortnightly cycle of training extension workers and their fixed-day visits to contact farmers under a single line of command.

Answer: (A) Go Back to Q40

Answer Key

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