SURE SHOT SELECTION BATCH BY INDIAN IQ

LAST MINUTE PREPARATION TOOLS FOR IBPS AFO MAINS

- LAST MINUTE NOTES
- QUESTION BANKS
- TOP ONE LINERS NOTES
- 10 ONLINE MAHAMOCKS

COURSE DEMO

SURE SHOT SELECTION BATCH FOR IBPS AFO MAINS BY INDIAN IQ

LAST-MINUTE ENTOMOLOGY & NEMATOLOGY NOTES FOR IBPS AFO MAINS: TOOL KIT

COURSE- SURE SHOT SELECTION BATCH BY INDIAN IQ

ENTOMOLOGY

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1. History & Pioneers

- Entomology = study of insects.
- Word "insect" = from *insecare* (to cut into).
- First Indian insect study → J.C. Fabricius.
- Lac insect account → Dr. Kerr.
- *Entomology of Himalayas & India* → Rev. Hope.
- *Indian ants* → Dr. Rothney.
- Discovery of malarial parasite → Sir Ronald Ross.

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2. Key Institutions

- Forest Research Institute (FRI) → Dehradun.
- Zoological Survey of India (ZSI) → Kolkata.
- Directorate of Plant Protection, Quarantine & Storage (DPPQS) → Faridabad.
- NBAIR → Bengaluru (Beneficial insects, bio-control).
- IARI → New Delhi (Crop protection).

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3. General Insect Facts

- Insects = ~70% of animal kingdom.
- Most diverse order → Coleoptera.
- Body wall = cuticle (chitin + sclerotin).
- Chitin = 25–60% dry weight, SG = 1.4.
- Compound eyes = Ommatidia.
- Egg-laying capacity = Fecundity.
- Controlled reproduction → Honeybee & Termite.

- Larvae of swallowtail → Osmeteria glands.
- Blister beetle → Cantharidin (irritant).

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4. Body Structure & Segmentation

- Primary segmentation → embryonic segments (somites).
- Secondary segmentation → adult arrangement.
- Tagmosis → grouping segments into functional regions.
- Thorax: prothorax, mesothorax, metathorax.
- Pterothorax = meso + metathorax.
- Head types: hypognathous → Grasshopper/Cockroach; prognathous → Beetles; opisthognathous → Bugs.

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5. Integument & Cuticle

- Layers: epicuticle (waxy), exocuticle (sclerotin), endocuticle.
- Wax layer → prevents water loss.
- Polyphenol layer → acid & solvent resistant.
- Resilin → elastic protein at joints.
- Apolysis → separation of old cuticle.
- Pharate instar → stage between old & new cuticle.

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6. Head & Mouthparts

- Antennae = scape → pedicel (Johnston's organ) → flagellum.
- Mouthparts types:
    - Chewing → Grasshopper, Beetle.
    - Piercing-sucking → Bugs, Mosquito. Hypopharynx = pharyngeal pump.
    - Chewing-lapping → Honeybee. Glossae have long hairs, flabella.
    - Siphoning → Butterflies, coiled proboscis.
    - Sponging → Housefly, labellum with pseudo-tracheae.

- Degenerate → Maggots, reduced.

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7. Thoracic Appendages

- Legs: Coxa → Trochanter → Femur → Tibia → Tarsus → Claws.
- Leg types:
  - Saltatorial → jumping → Grasshopper.
  - Natatorial → swimming → Water beetle.
  - Raptorial → prey capture → Mantid.
  - Ambulatory → walking → Cockroach.
  - Fossorial → digging → Mole cricket.
  - Scansorial → clinging → Head louse.
- Spurs = multicellular; crochets on tarsus = hooks.

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8. Wings & Venation

- Forewing → Tegmina, Elytra, Hemelytra.
- Hindwing → flight, balance; Halteres in Diptera.
- Wing veins: Costa (C), Subcosta (Sc), Radius (R), Radial sector (Rs), Media (M), Anal veins (A).
- Cross veins: humeral, radial, sectorial, radio-medial.
- Hindwing adaptations: Hamuli → Hymenoptera; Frenulum → Lepidoptera; Plume → fissured wings.
- Vannal area → Clavus (forewing), Vanus (hindwing).

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9. Vision

- Compound eyes → Ommatidia units.
- Apposition → diurnal, sharp images.
- Superposition → nocturnal, light-sensitive.
- Simple eyes → dorsal ocelli, ventral stemmata.
- Corneagen cells → secrete cornea.

- Rhabdom → contains rhodopsin.

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10. Digestive System

- Foregut (stomodaeum): pharynx, oesophagus, crop, proventriculus.
- Midgut (mesenteron): peritrophic membrane present (absent in sap-suckers).
- Hindgut (proctodaeum): lined by intima.
- Silk glands (Bombyx mori) → fibroin + sericin.
- Extra-intestinal digestion → outside intestine.

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11. Circulatory & Excretory Systems

- Open circulatory system → haemolymph flows in hemocoel.
- Dorsal blood vessel → principal organ; anterior part = aorta.
- Reflex bleeding → blood oozes through pores.
- Malpighian tubules → excretion; cryptonephridial → fused with hindgut.
- Urate cells → store uric acid in fat body.
- Labial glands → ammonia removal.

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12. Respiration

- Trachea → open system via spiracles.
- Tracheoles → fine branches for gas exchange.
- Holopneustic → all spiracles functional → dragonfly, grasshopper, cockroach.
- Plastron respiration → aquatic beetles.
- Tracheal gills → abdominal gills in aquatic larvae.

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13. Nervous System

- Neurons → perikaryon + axon + dendrites + terminal arborizations.
- Synapse → info transfer between neurons.
- Ventral nerve cord → segmented ganglia.

- Brain → neurosecretory cells → PTTH, eclosion hormone.

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14. Reproduction & Development

- Oviparity → egg-laying.
- Viviparity → live young.
- Ovo-viviparity → eggs hatch inside female.
- Adenoparous viviparity → yolk-rich eggs retained.
- Pseudoplacental viviparity → yolk-poor eggs retained.
- Parthenogenesis → reproduction without male.
- Neoteny → immature insects reproduce.
- Ovarioles → panoistic (Odonata, Orthoptera), meroistic.
- Spermatheca → stores sperm.
- Accessory glands → mushroom glands in cockroach.

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15. Hormones

- Brain hormone → neurosecretory secretion.
- PTTH → prothoracic glands → ecdysone (molting).
- Juvenile Hormone → corpora allata; regulates metamorphosis & yolk deposition.
- Eclosion hormone → triggers adult emergence.

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16. Classification

- Aristotle → first classification.
- Linnaeus → modern taxonomy.
- Holotype → main specimen described.
- Allotype → opposite sex of holotype.
- Paratypes → other specimens of same species.
- Family names end in *-idae*.
- Homonymy → same name for different organisms.

17. Orders, Families & Key Pests

- **Coleoptera**: chewing → Coccinellidae (ladybird), Bruchidae (pulse beetle), Scarabaeidae (chafers, root grubs), Chrysomelidae (leaf beetle), Curculionidae (weevils); pests → Oryctes rhinocerous, Holotrichia serrata, Dicladispa armigera.
- **Lepidoptera**: siphoning → Noctuidae, Sphingidae, Pyralidae, Papilionidae; pests → Scirpophaga incertulas, Leucinodes orbonalis, Amascta albistriga.
- **Hymenoptera**: chewing/lapping → Ichneumonidae, Braconidae, Tenthredinidae; pest → Athalia lugens.
- **Diptera**: piercing/sucking, sponging → Muscidae, Agromyzidae, Cecidomyiidae; pests → Orseolia oryzae, Delia radicum.
- **Hemiptera**: piercing-sucking → Pentatomidae, Aphididae, Cicadellidae; pests → Amrasca biguttula, Nilaparvata lugens.
- **Orthoptera**: chewing → Acrididae, Gryllidae; pests → Locusta migratoria, Oxya spp.
- **Thysanoptera**: rasping-sucking → Thripidae; pest → Thrips tabaci.
- **Isoptera**: chewing → Termitidae; pests → Odontotermes, Microtermes.
- **Siphonaptera**: piercing-sucking → Pulicidae; pests → fleas.

PESTS OF FIELD CROPS AND STORED GRAINS

1: Economic Entomology

- **Definition:** Study of insects which are variously related to the welfare of mankind.
- **Example of stinging insects injecting venom:** Bees
- **Example of insect acting as intestinal parasite:** Horse bot fly
- **Insects are classified into 3 groups from economic perspective:**
    1. **Pests** – injurious to crops
    2. **Beneficial insects** – natural enemies, pollinators
    3. **Neutral insects** – no significant economic impact

2: Rice Pests

Pest	Family	Symptoms / Identification	Management / Notes
Rice Stem Borer	Pyralidae	Female: bright yellowish brown forewings, black spot, anal tuft; Dead hearts at vegetative, white ears at heading	Tip clipping before transplant; Xanthopimpla spp., Goniozus indicus (larval parasitoid)
Yellow Stem Borer	Crambidae	Dead hearts at vegetative, white ears at heading	Same as above
Rice Gall Midge	Cecidomyiidae	Female: bright orange-red abdomen, telescopic body; Gall/Silver shoot (hollow cylindrical tube in tillers)	Avoid late transplanting; Platygaster oryzae (larval parasitoid)
Brown Planthopper (BPH)	Delphacidae	Hopper burn (toxic saliva); drying in circular patches; dominant in vegetative phase	Formation of alleys every 2m; Cyrtorhinus lividipennis (natural enemy)
White Backed Plant Hopper	Delphacidae	—	—
Rice Hispa	Chrysomelidae	Small, square, bluish black, shiny with spines	—
Rice Leaf Folder	Pyralidae	Whitish folded leaves with white streaks	Rope passing across crop dislodges larvae; Xanthopimpla emaculata (parasitoid)
Rice Whorl Maggot	Ephydridae	—	—
Rice Tungro Virus	—	Transmitted by Green Leaf Hoppers	—
Site of Oviposition (Gall Midge)	—	Leaf sheath	—
Alternate Host (Gall Midge)	—	Cynodon dactylon	—

Pest	Family	Symptoms / Identification	Management / Notes
Egg Parasitoid (Stem Borer)	—	Xanthopimpla spp.	—

3: Sorghum and Ragi Pests

Pest	Family	Symptoms / Damage	Management / Notes
Sorghum Stem Borer	Crambidae	Dead hearts with no offensive smell at cut end	Pupal parasitoid: Xanthopimpla punctata; pupation inside stem
Sorghum Shoot Fly	—	Dead hearts with extra side tillers	Early sowing; higher seed rate 12kg/ha; male abdomen: 4 black spots
Ragi Pink Borer	Crambidae	Dead hearts in young seedlings	Site of oviposition: between stem & leaf sheath
Sorghum Midge	Cecidomyiidae	Chaffy grains with round holes; red ooze on squeezing	—
Sorghum Earhead Bug	Miridae	Shaking ear heads in kerosene water destroys nymphs	—
Red Hairy Caterpillar	Lymantriidae	Crop looks grazed by cattle	Jatropha leaves attract larvae

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4: Sugarcane Pests

Pest	Family	Symptoms / Damage	Management / Notes
Early Shoot Borer	Crambidae	Dead hearts; caterpillar white with dark head & 5 violet stripes	Settings treatment; Mulching
Top Shoot Borer	Crambidae	Dead hearts & bunchy top	Eggs near midribs
Whitefly	Aleyrodidae	Sugarcane juice watery	Yellow sticky traps for monitoring

Pest	Family	Symptoms / Damage	Management / Notes
Leafhopper	Cicadellidae	Sucrose % decreases	—
Scales	Diaspididae	Shrivelled canes, shortened internodes	—

5: Cotton Pests

Pest	Family	Symptoms / Damage	Management / Notes
Pink Bollworm	Noctuidae	Rosette flowers, diapause in larval stage	Gossyplure pheromone for monitoring; trap crop: Marigold
Helicoverpa armigera	Noctuidae	Flared/open squares	Trap crop: Marigold/Okra; Bt. Cotton successful
Leaf Hopper	Cicadellidae	Stunted plant growth	Resistant variety: Narasimha
Whitefly	Aleyrodidae	Leaf curl, syrupy juice	Resistant variety: Kanchana
Red Cotton Bug	Pyrrhocoridae	Eggs in soil	Predators: Harpactor costali
Dusky Cotton Bug	Lygaeidae	—	Predator: Orius tantilis
Mites	Tetranychidae	Leaves curl, harden, shed	Acaricides like Dimethoate, Kelthane

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6: Jute, Redgram, Groundnut, Castor, Soybean, Safflower, Mustard Pests

Crop	Pest / Family / Scientific Name	Damage / Symptoms	Management / Notes
Jute	Stem Weevil / Apion corchori	Injury knots on stem	—
Jute	Semilooper / Tricholiga sorbilans	Suppressed by larval parasite	—
Redgram	Pod Fly / Euderus agromyzae	1 mm holes in pods	Shake plants mechanically
Redgram	Pod Borer / Helicoverpa armigera	Circular holes on pods	Mechanical shaking, trap crops

Crop	Pest / Family / Scientific Name	Damage / Symptoms	Management / Notes
Groundnut	Leaf Miner / Aproaerema modicella	Mining & webbing on leaves	Soybean trap crop
Groundnut	Pod Bug	Shrivelled, bitter pods	—
Castor	Semilooper / Parasa lepida	Larval & adult feeding	Braconid Micropletis ophiusae
Castor	Shoot & Capsule Borer / Conogethis punctiferalis	Eggs on tender shoots & capsules	—
Soybean	Leaf Miner / Aproaerema modicella	—	—
Safflower	Leaf eating caterpillar / Prospalta capensis	—	—
Mustard	Saw Fly / Athalia lugens proxima	Serious crop damage, 8 pairs of prolegs	Alternate hosts: Radish, Crucifers
Gingelly	Antigatra catalaunalis	—	—

7: Stored Grain Pests & Management

Pest	Family	Symptoms / Identification	Management / Notes
Rice Moth	Pyralidae	Webbed grain masses	Malathion; confined to top layers
Pulse Beetle	Bruchidae	Damage in field & storage	—
Khapra Beetle	Dermestidae	Cast skins, grass & hairs on bags	Malathion
Saw Toothed Grain Beetle	Silvanidae	6 teeth-like projections on thorax	Malathion
Confused Flour Beetle	Tenebrionidae	Wingless	—
Lesser Grain Borer	Bostrichidae	—	—

- **Storage Losses:** FAO estimates **10% annually worldwide**
- **Hidden infestation:** Field infestation via stored grains
- **Cross infestation:** Infestation from old stocks to fresh stocks

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8: Rodents & Birds

Pest	Scientific Name	Damage / Management
White Field Rat	Millardia meltada	Damage in storage; preventive: food & habitat manipulation
Indian Field Mouse	Mus booduga	—
3-striped Squirrel	Funambulus palmarum	—
5-striped Squirrel	Funambulus penneti	—
Birds	—	Bioacoustics, Netting, Sticky material (Lassa), 8 perches/acre

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9: Mites, Acaricides & Nematodes

- **Tea Mites:**
  - Red spider mite – Oligonychus coffeae
  - Purple mite – Calacarus carinatus
  - Pink mite – Acaphylla theae
  - Scarlet mite – Brevipalpus australis
- **Red spider mite family:** Tetranychidae
- **Redgram mite:** Eriophyidae
- **Predatory mite:** Amblyseius longispiosus
- **Acaricides:** Dimethoate, KELTHANE (specific)
- **Nematodes:** Minute worm-like animals without true body cavity

- White tip nematode (rice): Aphelenchoides besseyi → Kernels distorted/chaffy
- Wheat gall nematode: Anguina tritici → Tundu/yellow slime disease → Resistant variety: Kanred
- Wheat cyst nematode: Heterodera avenae

NEMATOLOGY

1: History & Pioneers

- Nematology = study of nematodes (roundworms).
- First systematic study → Karl Rudolphi (1808–1819), "Father of Nematology."
- Meloidogyne, Heterodera, and Globodera were described in early 20th century.
- Important Indian researchers: S.R. Rao, S.R. Bhalerao, P.N. Singh, N. Seshadri.
- First Indian Nematology lab → IARI, New Delhi.
- *Principles of Nematology* → E.J. Golden & H.S. Sher.

2: Key Institutions

- **Indian Nematological Society** → Nagpur.
- **Division of Nematology, IARI** → New Delhi.
- **Central Institute of Cotton Research** → Nagpur (cotton nematodes).
- **ICAR-NBAIR** → Bengaluru (biological control of nematodes).
- **State Agricultural Universities (SAUs)** → Nematode research in pulses, vegetables, and horticultural crops.

3: General Facts

- Nematodes are **unsegmented, cylindrical, bilaterally symmetrical, pseudocoelomate worms**.
- Body covered by **cuticle**; non-cellular, secreted by hypodermis.
- **Pseudocoelom** → body cavity; fluid-filled, acts as hydrostatic skeleton.

- Size: microscopic (0.1 mm) to 10 cm (parasitic nematodes).
- Nutrition: free-living (bacteria, fungi) or parasitic (plants, animals).
- Economic importance: ~15% of crop losses caused by plant parasitic nematodes.
- Most diverse families: Meloidogynidae, Heteroderidae, Tylenchidae, Pratylenchidae.

4: Anatomy & Morphology

- Body regions: head (with lips, stylet in plant-parasitic nematodes), oesophagus, intestine, reproductive system, tail.
- Digestive system: complete, tubular.
- Feeding apparatus:
    - **Stylet** → pierces plant cells.
    - **Esophageal glands** → secretions for infection.
- Nervous system: simple, circumpharyngeal ring, lateral nerve cords.
- Excretory system: lateral canal or renette cells.
- Cuticle: multilayered → epicuticle, cortical layer, basal layer.
- Reproduction: sexual (dioecious, male/female) or parthenogenetic (Meloidogyne spp.).

5: Life Cycle & Reproduction

- Egg → four juvenile stages (J1–J4) → adult.
- **Hatching** influenced by soil temperature, moisture, host root exudates.
- Some species (Meloidogyne, Pratylenchus) undergo **parthenogenesis**.
- Male vs female morphology varies (female larger, sedentary; male smaller, motile).
- Life cycle duration: 3–6 weeks in favourable conditions (Meloidogyne spp.).
- Facultative dormancy → survival in adverse conditions (eggs in soil).

6: Physiology

- Cuticle regulates water loss and gas exchange.
- Pseudocoelomic fluid → hydrostatic pressure for movement.

- Digestive enzymes → cellulases, pectinases for plant cell penetration.
- Nervous system → controls movement, host detection.
- Reproductive hormones → regulate egg laying, juvenile development.

7: Major Orders & Families

Order	Family	Key Genera	Host / Notes
Tylenchida	Meloidogynidae	Meloidogyne	Root-knot nematode, polyphagous, gall formation
Tylenchida	Heteroderidae	Heterodera, Globodera	Cyst nematodes, potato, soybean, cereals
Tylenchida	Pratylenchidae	Pratylenchus	Lesion nematode, wide host range
Aphelenchida	Aphelenchidae	Aphelenchoides	Foliar nematodes, Fungi feeders
Dorylaimida	Longidoridae	Xiphinema	Virus vector, nematode transmitted plant viruses
Rhabditida	Rhabditidae	Rhabditis	Free-living, beneficial, soil microflora
Tylenchida	Rotylenchulidae	Rotylenchulus	Semi-endoparasitic, sugarcane, vegetables
Tylenchida	Anguinidae	Anguina	Seed gall nematodes, grasses & cereals

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8: Key Pests & Economic Importance

- **Meloidogyne incognita** → root-knot nematode, polyphagous, stunted growth.
- **Heterodera glycines** → soybean cyst nematode.
- **Globodera rostochiensis** → potato cyst nematode.
- **Pratylenchus spp.** → root-lesion nematodes.
- **Rotylenchulus reniformis** → sugarcane, cotton.
- **Xiphinema spp.** → nematode-transmitted plant viruses.
- **Aphelenchoides besseyi** → white tip of rice, foliar nematode.
- **Anguina tritici** → seed gall of wheat (famine causing).

9: Management (IPM)

- **Cultural control**: crop rotation, resistant varieties, fallowing, organic amendments.
- **Chemical control**: Nematicides → Carbofuran, Oxamyl, Fenamiphos.
- **Biological control**:
    - Fungi → Paecilomyces, Pochonia chlamydosporia.
    - Bacteria → Bacillus firmus.
- **Soil solarization** → reduces egg and juvenile population.
- **Sanitation** → clean planting material, eradication of infected residues.

ANIMAL HUSBANDRY TOP ONE LINER QUESTIONS FOR IBPS AFO MAINS

COURSE- SURE SHOT SELECTION BATCH BY INDIAN IQ

1. The term for absence of estrus cycle in female animals is? **Anestrus**
2. Standard dilution ratio of bull semen in liquid nitrogen storage is? **1:10**
3. Which metabolic disorder in cattle is known as “Acetonaemia”? **Ketosis**
4. The first milk secreted after parturition rich in antibodies is? **Colostrum**
5. The test used to detect mastitis by detergent reagent is? **CMT**
6. Normal service period in dairy cattle is about? **90-days**
7. The specific gravity of cow milk is approximately? **1.032**
8. The act of chewing cud in ruminants is called? **Rumination**
9. Which vitamin is synthesized in the rumen by microbes? **B12**
10. The ideal body condition score for dairy cows at calving is? **3.5**
11. The energy value of feed expressed as metabolizable energy in ruminants is measured in? **MJ/kg**
12. Normal duration of estrus in buffaloes is about? **24-hours**
13. The process of heat treatment of milk at 72°C for 15 seconds is? **Pasteurization**
14. The act of parturition in goats is called? **Kidding**
15. Which nematode parasite of cattle causes bottle jaw? **Haemonchus**
16. The hormone used to induce superovulation in cattle is? **FSH**
17. Average sperm concentration in bull semen per ml is? **1000-million**
18. Which diagnostic test is widely used for detection of Brucellosis? **RBPT**
19. The non-protein nitrogen compound commonly fed to ruminants is? **Urea**
20. The mineral deficiency causing milk fever is? **Calcium**
21. The device used for semen straw sealing in AI is called? **Polyvinyl-sealer**

22. Normal pulse rate of an adult goat per minute is? **80–90**
23. The average rectal temperature of buffalo is? **101.5°F**
24. Which zoonotic disease in animals is caused by Bacillus anthracis? **Anthrax**
25. The interval between calving and conception is termed? **Days-open**
26. In dairy science, the term SNF refers to? **Solids-not-fat**
27. The organ responsible for microbial fermentation in ruminants is? **Rumen**
28. The typical length of oestrous cycle in cows is? **21-days**
29. The male goat is technically referred to as? **Buck**
30. The carbohydrate fraction of cell walls indigestible to animals is? **Lignin**
31. The disease in cattle commonly called “mad cow” is? **BSE**
32. Average rumen pH maintained for optimum digestion is? **6.5**
33. The unit used to express feed energy available for maintenance is? **NEL**
34. The instrument used to test milk fat percentage is? **Lactometer**
35. The reproductive technology involving freezing of embryos is? **Cryopreservation**
36. The hormone responsible for milk ejection reflex is? **Oxytocin**
37. The term for difficulty in calving is? **Dystocia**
38. Average semen volume collected from a bull per ejaculate is? **5-8ml**
39. The test for adulteration of milk with water based on freezing point is? **Cryoscope**
40. In goats, the average lactation length is about? **200-days**
41. The first Indian cattle clone was produced at which institute? **NDRI**
42. The metabolic disorder in high-yielding cows associated with hypoglycemia is? **Ketosis**

43. The term for inflamed udder in dairy cows is? **Mastitis**

44. The vaccine used to control Foot and Mouth disease is? **Polyvalent**

45. The unit used for measuring bacterial load in milk is? **CFU/ml**

46. Which mineral deficiency leads to pica in cattle? **Phosphorus**

47. The process of selective breeding using progeny test is called? **Progeny-testing**

48. The interval between two successive milkings is termed? **Milking-interval**

49. Which vitamin deficiency in calves causes night blindness? **A**

50. The common test for detection of sub-clinical mastitis is? **CMT**

51. The by-product obtained from slaughtered animals used in soap industry is? **Tallow**

52. In goats, the average gestation period is? **150-days**

53. Which disease in cattle is caused by Theileria annulata? **Theileriosis**

54. The hormone responsible for follicular development is? **FSH**

55. The normal ratio of calcium to phosphorus in dairy cattle ration is? **2:1**

56. Which diagnostic test is used for detecting TB in cattle? **Tuberculin**

57. The process of fermentation in silage produces primarily? **Lactic-acid**

58. The instrument used for dehorning calves is? **Dehorner**

59. In ruminants, eructation helps in expelling? **Gas**

60. The common vector of Surra disease in cattle is? **Tabanus**

61. Which protein fraction in milk precipitates at pH 4.6? **Casein**

62. The measure of digestibility of feed expressed as % is called? **TDN**

63. Which disease of cattle is known as quarter evil? **Blackleg**

64. The Indian project aimed at genetic improvement of indigenous cattle is? **Gokul-Mission**

65. The fluid secreted before true milk after calving is? **Colostrum**

66. Which drug is used for deworming cattle against roundworms? **Albendazole**

67. The act of removing fleece from sheep is called? **Shearing**

68. In semen cryopreservation, the freezing medium contains? **Glycerol**

69. The disease in goats characterized by arthritis and encephalitis is? **CAE**

70. The byproduct of wool industry used in fertilizer is? **Wool-waste**

71. The oestrus synchronization drug commonly used is? **Progesterone**

72. The colour of healthy rumen fluid is? **Olive-green**

73. Which disease of cattle is controlled by "S19 vaccine"? **Brucellosis**

74. The protein efficiency ratio is calculated using which test animal? **Rat**

75. The process of milk fat separation is carried out by? **Centrifuge**

76. The instrument used to measure somatic cell count in milk is? **Fossomatic**

77. In goat breeds, Jamunapari is native to which state? **UP**

78. The end product of cellulose digestion in rumen is? **VFA**

79. The disease of cattle caused by Clostridium chauvoei is? **Blackquarter**

80. The preservative commonly added in milk samples for fat testing is? **Formalin**

81. The act of artificial insemination must deposit semen in? **Uterus**

82. Which mineral deficiency causes swayback in lambs? **Copper**

83. The pH of fresh cow milk is generally? **6.6**

84. The metabolic disorder in ruminants due to excess protein breakdown is? **Ammonia-toxicity**

85. The Indian goat breed producing highest milk yield is? **Jamunapari**

86. The portion of milk proteins soluble in whey are called? **Albumins**
87. The vaccine used against HS in cattle is prepared from? **Pasteurella**
88. Which zoonotic disease in goats is transmitted by raw milk? **Brucellosis**
89. The highest digestibility coefficient among nutrients is for? **Fat**
90. Which instrument is used for AI gun sterilization? **Autoclave**
91. In sheep, the average gestation period is? **150-days**
92. The unit used to express semen motility under microscope is? **Percent**
93. Which disease in cattle is called redwater fever? **Babesiosis**
94. The structure in rumen responsible for papillae absorption is? **Epithelium**
95. The Indian scheme that introduced crossbreeding with exotic bulls in the 1970s is? **Operation-Flood**
96. Which mineral deficiency leads to retained placenta in cows? **Selenium**
97. The optimum temperature for storing frozen semen is? **-196°C**
98. Which wool fibre property is measured in microns? **Fineness**
99. The parasite Fasciola hepatica is commonly known as? **Liver-fluke**
100. The fat-rich milk secretion before weaning in goats is called? **Colostrum**
101. The drug used for inducing parturition in cattle is? **PGF2α**
102. The test used for estimating milk protein is? **Kjeldahl**
103. Which deficiency in calves leads to white muscle disease? **Selenium**
104. The major fatty acid in milk fat is? **Palmitic**
105. Which goat breed is famous for mohair fibre production? **Angora**
106. The first AI centre in India was established in which state? **Mysore**
107. The standard preservative used in semen extenders is? **Antibiotics**
108. Which disease in cattle shows characteristic lumpy skin lesions? **LSD**

109. The ratio of acetate to propionate in normal rumen is about? **3:1**
110. Which byproduct of slaughterhouse is used for making gelatin? **Bones**
111. The enzyme responsible for curdling of milk in calf stomach is? **Rennin**
112. Which disease in goats is called Peste des Petits Ruminants? **PPR**
113. The optimum RH for dairy cattle housing is about? **60%**
114. The part of AI straw containing semen is sealed with? **Polyvinyl**
115. Which goat breed is known as Beetal's cousin? **Jamunapari**
116. The deficiency of cobalt in ruminants affects synthesis of? **B12**
117. Which cattle disease is tested using Johnin test? **Johne's**
118. The wool obtained from first shearing of lamb is called? **Lambswool**
119. Which metabolic disease is also termed parturient paresis? **Milk-fever**
120. The Indian goat breed producing best quality pashmina is? **Changthangi**
121. The organ responsible for absorption of VFA in ruminants is? **Rumen**
122. Which parasite in cattle transmits East Coast fever? **Ticks**
123. The optimum fat:protein ratio in cow milk is? **1.2:1**
124. The disease of cattle characterized by papillomas is? **Warts**
125. Which diagnostic test is used for detecting mastitis online? **EC-meter**
126. The wool produced in Rajasthan from Magra sheep is known as? **Carpet-wool**
127. Which AI-related chemical is used to thaw semen straws? **Water-bath**
128. The oestrus synchronization protocol using GnRH-PGF2α is called? **Ovsynch**
129. Which goat breed is native to Rajasthan desert? **Barbari**
130. The disease in sheep caused by Corynebacterium pseudotuberculosis is? **Caseous-lymphadenitis**

131. The critical temperature above which dairy cows suffer heat stress is? **25°C**

132. The method of mating closely related individuals is called? **Inbreeding**

133. Which parasite causes nasal myiasis in sheep? **Oestrus-ovis**

134. The wool fibre property determining elasticity is? **Crimp**

135. Which mineral deficiency causes goitre in goats? **Iodine**

136. The Indian goat breed specialized for meat is? **Black-Bengal**

137. The milk enzyme inactivated by pasteurization and used as test is? **Phosphatase**

138. The normal pH of rumen fluid in acidosis drops below? **5.5**

139. Which cattle breed is used to develop Frieswal? **Sahiwal**

140. The average age at first kidding in goats is? **15-months**

141. The disease of cattle characterized by papillomatous growth in teat canal is? **Warts**

142. The substance added in silage to improve fermentation is? **Molasses**

143. Which goat breed produces highest quality chevon in India? **Black-Bengal**

144. The cattle disease eradicated from many countries but endemic in India is? **Rinderpest**

145. The wool grading is primarily based on? **Fibre-diameter**

146. The test used for detection of mastitis measuring electrical conductivity is? **ECM**

147. The metabolic disorder in sheep due to energy deficiency in late pregnancy is? **Pregnancy-toxaemia**

148. Which goat breed is famous for twin kidding? **Barbari**

149. The infectious disease in cattle spread through coitus is? **Vibriosis**

150. The standard cryoprotectant in semen freezing is? **Glycerol**

151. The enzyme complex responsible for cellulose digestion in rumen is? **Cellulase**

152. Which deficiency causes creeping gait in calves? **Manganese**

153. The byproduct obtained from hides after tanning is? **Glue**

154. The woollen fabric produced from fine wool of Kashmir goats is? **Pashmina**

155. The parasite causing liver fluke disease belongs to genus? **Fasciola**

156. Which disease in goats is prevented by FMD vaccine? **FMD**

157. The pH of silage ideally remains around? **4.0**

158. The normal hemoglobin level in cattle blood is about? **12g/dl**

159. Which disease of goats is also called contagious ecthyma? **Orf**

160. The portion of milk which remains after cream removal is? **Skim**

161. Which method of AI straw thawing is best for motility? **Water-bath**

162. The common disinfectant used in dairy farm footbaths is? **Formalin**

163. Which goat breed is common in Punjab for milk? **Beetal**

164. The part of the stomach of ruminants known as “true stomach” is? **Abomasum**

165. The metabolic disorder in cows linked to low magnesium is? **Grass-tetany**

166. Which sheep breed of Rajasthan is famous for carpet wool? **Chokla**

167. The vaccine against PPR in goats is prepared from? **Rinderpest**

168. The wool grading system in India is based on? **Micron**

169. Which buffalo breed has highest butterfat content? **Bhadawari**

170. The test used for detection of milk adulteration with starch is? **Iodine**

171. Which zoonotic disease is also called Malta fever? **Brucellosis**

172. The metabolic disease in sheep caused by cobalt deficiency is? **Pine**

173. Which goat breed is also called dwarf breed of Karnataka? **Osmanabadi**

174. The silage fermentation dominated by Clostridia produces? **Butyric**

175. The wool from undercoat of yak is called? **Pulu**

176. The common metabolic disease in high-yielding dairy buffaloes is? **Ketosis**

177. Which deficiency in sheep leads to stiff lamb disease? **Vitamin-E**

178. The test used for detecting mastitis by gel formation with detergent is? **CMT**

179. The goat breed producing long twisted horns and found in MP is? **Jakhrana**

180. Which cattle disease is caused by Mycobacterium avium paratuberculosis? **Johne's**

181. The wool fibre diameter in fine apparel wool should be below? **20µ**

182. Which goat breed is famous as "milk queen of goats"? **Jamunapari**

183. The enzyme responsible for lipolysis in milk fat is? **Lipase**

184. The preservative used for semen samples during transport is? **Dry-ice**

185. The disease in cattle spread by blood-sucking flies is? **Surra**

186. Which goat breed is highly prolific and adapted to hot climates? **Barbari**

187. The process of protein clot formation in cheese is initiated by? **Rennin**

188. Which metabolic disorder in cattle results from phosphorus deficiency? **Osteomalacia**

189. The wool used for shawl making in Himachal Pradesh is? **Pashmina**

190. The deficiency of biotin in cattle leads to? **Dermatitis**

191. Which disease of cattle shows bluish tongue and nasal discharge? **Bluetongue**

192. The common vaccine used for controlling anthrax is prepared from? **Sterne**

193. Which goat breed is called the “poor man’s cow”? **Black-Bengal**

194. The wool property that gives warmth is due to? **Crimp**

195. The byproduct obtained from hooves used in adhesives is? **Neatsfoot**

196. The disease in cattle transmitted by mosquitoes is? **Lumpy-skin**

197. Which goat breed of Rajasthan produces highest milk yield? **Jamunapari**

198. The mineral deficiency causing anemia in sheep is? **Iron**

199. The Indian sheep breed producing best quality carpet wool is? **Chokla**

200. The preservation of hides using salt is called? **Curing**

SOIL SCIENCE SPECIAL QUESTION BANK FOR IBPS AFO MAINS

BATCH- SURE SHOT SELECTION BATCH BY INDIAN IQ

Q1. The soil layer from which plants extract the maximum amount of nutrients and water is primarily the:

a) O Horizon

b) A Horizon

c) B Horizon

d) C Horizon

e) R Horizon

Answer: b) A Horizon

Q2. The fundamental law of soil colloidal chemistry explaining the exchange of ions between soil and solution is called:

a) Law of Diminishing Returns

b) Gapon's Equation

c) Le Chatelier's Principle

d) Law of Mass Action

e) Blackman's Law

Answer: d) Law of Mass Action

Q3. The cation exchange capacity (CEC) of soil depends most directly on:

a) Soil pH

b) Soil organic matter and clay content

c) Soil texture alone

d) Evapotranspiration rate

e) Bulk density

Answer: b) Soil organic matter and clay content

Q4. The process of formation of sodium carbonate in alkali soils during reclamation is technically called:

a) Gypsum requirement reaction

b) Solodization

c) Alkali hydrolysis

d) Black alkali reaction

e) Dispersion

Answer: d) Black alkali reaction

Q5. The most stable form of soil organic matter which resists microbial decomposition is:

a) Hemicellulose

b) Lignin

c) Fulvic acid

d) Humus

e) Pectin

Answer: d) Humus

Q6. The soil structure where aggregates are arranged in vertical columns with rounded tops, usually seen in semi-arid regions, is termed:

a) Platy

b) Blocky

c) Prismatic

d) Columnar

e) Granular

Answer: d) Columnar

Q7. The “universal soil loss equation” (USLE) was primarily developed to estimate:

a) Soil compaction risk

b) Nutrient leaching losses

c) Soil erosion by water

d) Soil erosion by wind

e) Soil salinity levels

Answer: c) Soil erosion by water

Q8. The main diagnostic feature of laterite soils is the:

a) High base saturation

b) Excess of calcium carbonate

c) Accumulation of Fe and Al oxides

d) Poorly drained clay pan

e) Saline efflorescence

Answer: c) Accumulation of Fe and Al oxides

Q9. The soil moisture condition at which plants can no longer extract water and permanent wilting occurs is approximately:

a) –0.01 MPa

b) –0.033 MPa

c) –0.1 MPa

d) –1.5 MPa

e) –3.0 MPa

Answer: d) –1.5 MPa

Q10. The most common method of determining soil texture in the laboratory is by:

a) Neutron probe method

b) Hydrometer method

c) Gravimetric method

d) Thermogravimetric method

e) IR spectroscopy

Answer: b) Hydrometer method

Q11. The soil order characterized by volcanic ash parent material and high allophane content is:

a) Vertisols

b) Alfisols

c) Andisols

d) Ultisols

e) Entisols

Answer: c) Andisols

Q12. The presence of mottles in subsoil horizons generally indicates:

a) Excess salinity

b) Strong acidity

c) Poor drainage and alternating wetness

d) High organic matter accumulation

e) Excess phosphate fixation

Answer: c) Poor drainage and alternating wetness

Q13. The dominant clay mineral in black soils of India that gives high shrink-swell behavior is:

a) Illite

b) Kaolinite

c) Montmorillonite

d) Vermiculite

e) Chlorite

Answer: c) Montmorillonite

Q14. The salt index of a fertilizer mainly indicates:

a) Its water solubility

b) Tendency to increase osmotic pressure in soil solution

c) Its neutralizing value

d) Its efficiency for alkaline soils

e) Its acid-forming capacity

Answer: b) Tendency to increase osmotic pressure in soil solution

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Q15. The effective rainfall for crops is best defined as the portion of total rainfall that:

a) Falls during crop season

b) Enters soil profile and is available for plant use

c) Does not percolate beyond root zone

d) Exceeds potential evapotranspiration

e) Results in runoff

Answer: b) Enters soil profile and is available for plant use

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Q16. The bulk density of a typical mineral soil in a good condition for root growth usually ranges between:

a) 0.5–0.8 g/cm^3

b) 0.8–1.2 g/cm^3

c) 1.2–1.6 g/cm^3

d) 1.6–2.0 g/cm^3

e) Above 2.0 g/cm^3

Answer: c) 1.2–1.6 g/cm^3

Q17. The potential soil acidity is primarily associated with:

a) Exchangeable Al^{3+} and H^+

b) Soluble salts

c) Residual sodium carbonate

d) Dissolved oxygen

e) Calcium carbonate content

Answer: a) Exchangeable Al^{3+} and H^+

Q18. The nutrient which is most susceptible to leaching losses in sandy soils due to its anionic form is:

a) Potassium

b) Calcium

c) Nitrate-nitrogen

d) Sulphate

e) Ammonium

Answer: c) Nitrate-nitrogen

Q19. The phenomenon of illuviation refers to:

a) Removal of material from a horizon

b) Downward movement and accumulation of material in a lower horizon

c) Weathering of primary minerals

d) Development of soil structure

e) Podzolization process

Answer: b) Downward movement and accumulation of material in a lower horizon

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Q20. The term “caliche” in soil science generally denotes:

a) A clay pan layer

b) A hard layer cemented by calcium carbonate

c) Accumulation of humus in topsoil

d) Highly weathered oxides of iron

e) Excess of sodium carbonate

Answer: b) A hard layer cemented by calcium carbonate

Q21. The soil process responsible for the accumulation of silica in spodic horizons is known as:

a) Calcification

b) Laterization

c) Podzolization

d) Salinization

e) Solodization

Answer: c) Podzolization

Q22. In the mineral fraction of soil, the clay particles are defined as those having size less than:

a) 0.2 mm

b) 0.02 mm

c) 0.002 mm

d) 0.0002 mm

e) 0.02–0.2 mm

Answer: c) 0.002 mm

Q23. The soil order most dominant in India, covering nearly 24% of the total geographical area, is:

a) Alfisols

b) Entisols

c) Inceptisols

d) Vertisols

e) Mollisols

Answer: c) Inceptisols

Q24. Which nutrient is known to get fixed in soil by forming insoluble complexes with Fe and Al oxides in acidic soils?

a) Potassium

b) Nitrogen

c) Phosphorus

d) Magnesium

e) Sulphur

Answer: c) Phosphorus

Q25. The soil colloids which are crystalline in nature and have permanent negative charges are mainly:

a) Sesquioxides

b) Humus colloids

c) Kaolinite

d) Montmorillonite and illite

e) Allophane

Answer: d) Montmorillonite and illite

Q26. The ratio of mass of dry soil to the mass of water it can displace when submerged is called:

a) Bulk density

b) Particle density

c) Porosity

d) Relative density

e) Specific gravity

Answer: b) Particle density

Q27. The diagnostic horizon of Vertisols which shows deep wide cracks and slickensides is:

a) Kandic horizon

b) Argillic horizon

c) Cambic horizon

d) Vertic horizon

e) Ochric horizon

Answer: d) Vertic horizon

Q28. The “field capacity” of soil is generally achieved after:

a) 24 hours of saturation

b) 2–3 days after saturation and drainage

c) At permanent wilting point

d) At hygroscopic coefficient

e) During capillary rise

Answer: b) 2–3 days after saturation and drainage

Q29. The maximum amount of water held by soil particles against gravity is known as:

a) Gravitational water

b) Hygroscopic water

c) Capillary water

d) Available water

e) Equilibrium water

Answer: c) Capillary water

Q30. The pH at which phosphorus availability in soil is maximum lies between:

a) 4.0–4.5

b) 5.0–5.5

c) 6.0–7.0

d) 7.5–8.0

e) Above 8.5

Answer: c) 6.0–7.0

Q31. The cation exchange capacity of humus is approximately:

a) 10–20 cmol(+)/kg

b) 20–40 cmol(+)/kg

c) 50–100 cmol(+)/kg

d) 150–300 cmol(+)/kg

e) >400 cmol(+)/kg

Answer: d) 150–300 cmol(+)/kg

Q32. The water available to plants is mainly present between:

a) Field capacity and saturation

b) Permanent wilting point and hygroscopic coefficient

c) Field capacity and permanent wilting point

d) Saturation and gravitational water

e) Residual moisture and equilibrium water

Answer: c) Field capacity and permanent wilting point

Q33. In saline soils, the electrical conductivity (ECe) of the saturation extract is greater than:

a) 2 dS/m

b) 4 dS/m

c) 8 dS/m

d) 10 dS/m

e) 15 dS/m

Answer: b) 4 dS/m

Q34. The soil conservation practice in which land is tilled along its natural contour lines is called:

a) Mulching

b) Contour farming

c) Strip cropping

d) Bench terracing

e) Subsoiling

Answer: b) Contour farming

Q35. Which of the following soil organisms is mainly responsible for nitrification?

a) Rhizobium

b) Nitrosomonas and Nitrobacter

c) Azospirillum

d) Clostridium

e) Thiobacillus

Answer: b) Nitrosomonas and Nitrobacter

Q36. The water potential of saturated soil at free drainage is approximately:

a) 0 kPa

b) –10 kPa

c) –33 kPa

d) –1500 kPa

e) –3000 kPa

Answer: a) 0 kPa

Q37. The most important process in soil formation that leads to the development of horizons is:

a) Pedogenesis

b) Sedimentation

c) Mineralization

d) Aggregation

e) Denudation

Answer: a) Pedogenesis

Q38. The movement of water through soil pores under the influence of capillary forces is called:

a) Saturated flow

b) Unsaturated flow

c) Gravitational flow

d) Percolation

e) Preferential flow

Answer: b) Unsaturated flow

Q39. The soil order “Aridisols” is generally associated with:

a) Tropical rainforests

b) Humid subtropical regions

c) Arid and desert climates

d) Alpine ecosystems

e) Volcanic landscapes

Answer: c) Arid and desert climates

Q40. The swelling and shrinking property of Vertisols is due to:

a) Illite clay

b) Kaolinite clay

c) Montmorillonite clay

d) Sesquioxides

e) Organic matter colloids

Answer: c) Montmorillonite clay

Q41. The measure of soil’s ability to resist change in pH upon addition of acids or bases is called:

a) Buffering capacity

b) CEC

c) Base saturation

d) Liming value

e) Neutralizing potential

Answer: a) Buffering capacity

Q42. The soil forming factor that plays a dominant role in the genesis of peat soils is:

a) Climate

b) Organisms

c) Relief

d) Parent material

e) Time

Answer: b) Organisms

Q43. The availability of micronutrients like Fe, Mn, Zn, and Cu generally decreases when soil pH is:

a) Below 5.0

b) Between 5.5–6.5

c) Neutral (6.5–7.5)

d) Above 7.5

e) Around 8.5 only

Answer: d) Above 7.5

Q44. Which of the following soil properties cannot be changed by management practices?

a) Soil texture

b) Soil structure

c) Soil organic matter

d) Soil fertility

e) Soil bulk density

Answer: a) Soil texture

Q45. The acid sulfate soils, often found in coastal regions, are rich in:

a) Gypsum

b) Jarosite

c) Calcite

d) Feldspar

e) Dolomite

Answer: b) Jarosite

Q46. The dominant process of soil formation in high rainfall and humid tropical conditions leading to silica leaching is:

a) Calcification

b) Podzolization

c) Laterization

d) Gleization

e) Pedoturbation

Answer: c) Laterization

Q47. The soil water that is held with greatest force and unavailable to plants is:

a) Capillary water

b) Hygroscopic water

c) Gravitational water

d) Available water

e) Superfluous water

Answer: b) Hygroscopic water

Q48. The capacity of soil to supply the essential nutrients required by crops without external input is called:

a) Soil productivity

b) Soil fertility

c) Soil efficiency

d) Soil potential

e) Soil sustainability

Answer: b) Soil fertility

Q49. The horizon with significant clay accumulation translocated from above horizons is designated as:

a) E horizon

b) B horizon (argillic)

c) O horizon

d) C horizon

e) R horizon

Answer: b) B horizon (argillic)

Q50. The measure of the proportion of soil voids filled with water at a given time is termed:

a) Soil saturation

b) Soil porosity

c) Degree of saturation

d) Bulk density

e) Soil consistency

Answer: c) Degree of saturation

Q51. The ratio of base cations (Ca^{2+}, Mg^{2+}, K^{+}, Na^{+}) to the total cation exchange capacity of soil is known as:

a) Exchange ratio

b) Base saturation percentage

c) Liming value

d) Buffer index

e) Salinity ratio

Answer: b) Base saturation percentage

Q52. The reddish color of well-drained tropical soils is mainly due to the presence of:

a) Ferric oxides

b) Organic matter

c) Aluminum silicates

d) Manganese compounds

e) Calcium carbonate

Answer: a) Ferric oxides

Q53. The law which states that “nutrient in minimum supply relative to need is the limiting factor in plant growth” was proposed by:

a) Liebig

b) Blackman

c) Mitscherlich

d) Sprengel

e) Lawes

Answer: a) Liebig

Q54. The pH of sodic soils is usually:

a) <5.5

b) 6.0–6.5

c) 7.0–7.5

d) 8.2–10.0

e) >11.0

Answer: d) 8.2–10.0

Q55. The soil order that shows weak horizon development and is commonly found on floodplains is:

a) Mollisols

b) Entisols

c) Alfisols

d) Histosols

e) Oxisols

Answer: b) Entisols

Q56. The process of downward movement of soluble salts with percolating water is called:

a) Capillarity

b) Percolation

c) Leaching

d) Infiltration

e) Transpiration

Answer: c) Leaching

Q57. The illite clay mineral is commonly described as:

a) 1:1 type

b) 2:1 non-expanding type

c) 2:1 expanding type

d) 2:2 type

e) Amorphous type

Answer: b) 2:1 non-expanding type

Q58. The moisture content at permanent wilting point is approximately equal to:

a) 0.1 bar

b) 0.33 bar

c) 1 bar

d) 15 bar

e) 30 bar

Answer: d) 15 bar

Q59. The formula for calculating Sodium Adsorption Ratio (SAR) involves:

a) $(Ca^{2+} + Mg^{2+})/Na^{+}$

b) $Na^{+}/\sqrt{((Ca^{2+}+Mg^{2+})/2)}$

c) $(Na^{+}+K^{+})/(Ca^{2+}+Mg^{2+})$

d) Na^{+}/CEC

e) Na^+/Cl^-

Answer: b) $Na^+/\sqrt{((Ca^{2+}+Mg^{2+})/2)}$

Q60. The ratio between depth of water retained and depth of water applied in the soil is:

a) Water holding capacity

b) Water use efficiency

c) Irrigation efficiency

d) Water storage efficiency

e) Consumptive use coefficient

Answer: d) Water storage efficiency

Q61. The presence of a hard, compacted pan cemented by silica in soils is referred to as:

a) Duripan

b) Caliche

c) Fragipan

d) Hardpan

e) Plinthite

Answer: a) Duripan

Q62. The process by which organic nitrogen is converted into ammonium nitrogen is:

a) Ammonification

b) Nitrification

c) Denitrification

d) Immobilization

e) Volatilization

Answer: a) Ammonification

Q63. The diagnostic horizon rich in organic matter and dark in color found at the surface is termed:

a) Ochric horizon

b) Umbric horizon

c) Mollic horizon

d) Argillic horizon

e) Spodic horizon

Answer: c) Mollic horizon

Q64. The soil moisture available for plant growth is measured in terms of:

a) Soil potential

b) Soil tension

c) Matric potential

d) Plant available water

e) All of the above

Answer: e) All of the above

Q65. The clay mineral kaolinite is characterized by:

a) High shrink-swell capacity

b) Low CEC and non-expanding structure

c) High CEC and expanding lattice

d) Amorphous composition

e) Mixed-layer structure

Answer: b) Low CEC and non-expanding structure

Q66. Which of the following is a physical indicator of soil quality?

a) Soil pH

b) CEC

c) Organic carbon

d) Bulk density

e) Exchangeable sodium percentage

Answer: d) Bulk density

Q67. The phenomenon of capillary rise of water is more pronounced in soils with:

a) Sandy texture

b) Silty texture

c) Clayey texture

d) Loamy sand texture

e) Gravelly texture

Answer: c) Clayey texture

Q68. The soil reaction that releases hydroxyl ions and increases soil alkalinity is:

a) Hydrolysis

b) Carbonation

c) Reduction

d) Alkalization

e) Oxidation

Answer: a) Hydrolysis

Q69. The minimum temperature for effective nitrification in soil is around:

a) 0°C

b) 5°C

c) 10°C

d) 20°C

e) 35°C

Answer: c) 10°C

Q70. The soil process responsible for the accumulation of organic matter in wetlands under anaerobic conditions is:

a) Laterization

b) Gleying

c) Calcification

d) Salinization

e) Podzolization

Answer: b) Gleying

Q71. The specific surface area of clay particles is:

a) Lowest among soil separates

b) Higher than silt but lower than sand

c) Much higher than sand and silt

d) Negligible for nutrient exchange

e) Same as humus

Answer: c) Much higher than sand and silt

Q72. The soils having pH less than 5.5 with high exchangeable Al are referred to as:

a) Alkali soils

b) Saline soils

c) Acid sulphate soils

d) Acid soils

e) Lateritic soils

Answer: d) Acid soils

Q73. The value of bulk density greater than 1.8 g/cm^3 usually indicates:

a) Good tilth condition

b) Excess organic matter

c) Restricted root growth

d) High porosity

e) Soil compaction absent

Answer: c) Restricted root growth

Q74. The soil component which contributes maximum buffering against pH changes is:

a) Clay minerals

b) Silt fraction

c) Sand fraction

d) Organic matter

e) Free carbonates

Answer: d) Organic matter

Q75. The measure of the energy status of soil water relative to pure free water is termed:

a) Soil water content

b) Soil water potential

c) Soil porosity

d) Soil aeration

e) Soil water capacity

Answer: b) Soil water potential

Q76. The soil order “Mollisols” is characterized by:

a) Ochric epipedon

b) Mollic epipedon and high base saturation

c) Spodic horizon

d) Duripan horizon

e) Cambic horizon

Answer: b) Mollic epipedon and high base saturation

Q77. The downward movement of finer clay particles from upper to lower horizons is called:

a) Eluviation

b) Illuviation

c) Lessivage

d) Podzolization

e) Cheluviation

Answer: c) Lessivage

Q78. The optimum soil-water-air ratio for good plant growth is approximately:

a) 50:30:20

b) 25:25:50

c) 45:25:30

d) 20:20:60

e) 40:10:50

Answer: c) 45:25:30

Q79. The ion primarily responsible for the dispersion of soil colloids is:

a) Ca^{2+}

b) Mg^{2+}

c) Na^{+}

d) K^{+}

e) H^{+}

Answer: c) Na^{+}

Q80. The type of soil formed directly from the weathering of rocks without transportation is called:

a) Transported soil

b) Colluvial soil

c) Alluvial soil

d) Residual soil

e) Marine soil

Answer: d) Residual soil

Q81. The black color of chernozem soils is mainly due to:

a) Manganese oxides

b) Organic matter content

c) Iron oxides

d) Calcium carbonate

e) Humic acids

Answer: e) Humic acids

Q82. The mineral which is most resistant to weathering in soil is:

a) Feldspar

b) Quartz

c) Mica

d) Olivine

e) Pyroxene

Answer: b) Quartz

Q83. The physical property of soil most directly affected by tillage is:

a) Soil texture

b) Soil structure

c) Soil pH

d) Soil mineralogy

e) Soil genesis

Answer: b) Soil structure

Q84. The maximum field capacity is generally found in soils with:

a) Coarse sand

b) Loamy sand

c) Silt loam

d) Silty clay loam

e) Gravel

Answer: d) Silty clay loam

Q85. The soil water content between field capacity and wilting point is expressed as:

a) Gravitational water

b) Available water capacity

c) Capillary water only

d) Residual water content

e) Hygroscopic water

Answer: b) Available water capacity

Q86. The mineral responsible for high phosphorus fixation in lateritic soils is:

a) Quartz

b) Gibbsite

c) Feldspar

d) Calcite

e) Dolomite

Answer: b) Gibbsite

Q87. The optimum temperature range for rapid microbial decomposition of organic matter is:

a) 0–10°C

b) 10–20°C

c) 25–35°C

d) 40–50°C

e) Above 60°C

Answer: c) 25–35°C

Q88. The soil property that determines the relative proportions of sand, silt, and clay is:

a) Structure

b) Texture

c) Consistence

d) Porosity

e) Tilth

Answer: b) Texture

Q89. The diagnostic horizon of Spodosols enriched with illuvial organic matter and sesquioxides is:

a) Cambic horizon

b) Spodic horizon

c) Mollic horizon

d) Argillic horizon

e) Kandic horizon

Answer: b) Spodic horizon

Q90. The average organic carbon content of Indian soils is around:

a) 1.0%

b) 0.75%

c) 0.5%

d) 0.3%

e) 2.0%

Answer: c) 0.5%

Q91. The mineral soil fraction with least specific surface area is:

a) Clay

b) Silt

c) Sand

d) Gravel

e) Loam

Answer: d) Gravel

Q92. The process of vertical mixing of soil horizons caused by shrinking and swelling in Vertisols is:

a) Podzolization

b) Pedoturbation

c) Lessivage

d) Gleization

e) Calcification

Answer: b) Pedoturbation

Q93. The phenomenon of upward movement of dissolved salts due to evaporation from surface layers is:

a) Salinization

b) Alkalization

c) Capillary rise

d) Solodization

e) Flocculation

Answer: a) Salinization

Q94. The type of soil structure that resembles a granular or crumb-like arrangement favorable for root growth is:

a) Prismatic

b) Blocky

c) Platy

d) Granular

e) Columnar

Answer: d) Granular

Q95. The factor that plays the most significant role in soil aeration is:

a) Soil pH

b) Soil porosity and drainage

c) Soil temperature

d) Soil organic matter

e) Soil texture alone

Answer: b) Soil porosity and drainage

Q96. The soil order commonly known as "young soils" with little profile development is:

a) Entisols

b) Alfisols

c) Ultisols

d) Oxisols

e) Vertisols

Answer: a) Entisols

Q97. The process of acid formation due to oxidation of sulfide minerals like pyrite in soils is called:

a) Calcification

b) Podzolization

c) Sulphidization

d) Sulphuricization

e) Thiomorphosis

Answer: d) Sulphuricization

Q98. The soil colloids which possess both positive and negative charges depending on soil pH are:

a) Humus

b) Kaolinite and sesquioxides

c) Montmorillonite

d) Illite

e) Vermiculite

Answer: b) Kaolinite and sesquioxides

Q99. The presence of sodium carbonate in soils often results in:

a) Soil flocculation

b) Soil dispersion and poor permeability

c) Good soil tilth

d) High biological activity

e) High infiltration rate

Answer: b) Soil dispersion and poor permeability

Q100. The instrument commonly used to measure soil moisture tension in the field is:

a) Gravimetric balance

b) Psychrometer

c) Tensiometer

d) Gypsum block meter

e) Neutron probe

Answer: c) Tensiometer