

Fundamentals of Bioresources

1. Concept of Biodiversity
2. Components of biodiversity— species richness and species evenness;
3. Levels of biodiversity— organisational (genetic, species and ecosystem),
4. spatial (alpha, beta and gamma);
5. Magnitude of biodiversity (Global and national level);
6. Valuing biodiversity— direct- and indirect use values.
7. Geological Time Scale and species evolution (overview)
8. Species extinction
9. Causes of biodiversity loss - ultimate and proximate causes
10. IUCN scheme of threat categories (species and ecosystem)
11. Summary of latest IUCN Red list, RED Data Book
12. Global biodiversity hotspots (criteria, distribution and conservation implications)
13. Biomes and biodiversity richness
14. Food security and agrobiodiversity
15. Bioresources and Livelihood
16. Threats to traditional livelihood
17. Impact of globalization and urbanization on livelihood
18. In situ conservation strategies (National parks, Wildlife sanctuaries and Biosphere reserves in India);
19. Ex situ conservation strategies (Botanical gardens, Zoos, Aquaria, seed bank, gene bank and Cryopreservation)
20. Overview of major Protected Areas (National parks, Wildlife sanctuaries and Biosphere reserves) in India
21. Biodiversity measurement (sampling unit shape, size and number);
22. Biodiversity surrogates (types and use);
23. Remote Sensing and Geographical Information System in biodiversity conservation
24. Biodiversity informatics (concept and applications),
25. Role of Taxonomy in Biodiversity studies
26. Global Biodiversity Information Facility (GBIF)
27. Global biodiversity targets and indicators
28. Indian conservation efforts (organisations & legislations)
29. Climate change and species migration;
30. Ozone depletion and consequences;
31. UV-B and its impact on life;
32. Greenhouse effect and Global warming;;
33. Acid rain and its effect on organisms and ecosystems;
34. Environment Impact Assessment (EIA)- Concept and stages of EIA;
35. Sustainable development
36. Convention on Biological Diversity (CBD)- Aims and objectives;
37. Ramsar Convention
38. Kyoto protocol
39. Biodiversity conservation and public participation (Role of Traditional Knowledge in Biodiversity Conservation; Community based ecosystem conservation)
40. Energy crisis and need for green energy;
41. Concept of green Building, vertical gardens; Greenwashing, eco-labelling

Plant Resources

1. Man as hunter gatherer,
2. Origin of agriculture;
3. Centers of origin and domestication of cultivated plants as proposed by de Candolle and Vavilov;
4. Poverty and food insecurity,
5. Green revolution (GR),
6. Impact of GR on indigenous crops, the next GR, Modern super crops,
7. Coalition for digital environmental sustainability (CODES).
8. Cultivation and utility of rice (*Oryza sativa*), wheat (*Triticum aestivum*), maize (*Zea mays*)
9. Cultivation and utility of maize (*Zea mays*)
10. Cultivation and utility of buckwheat (*Fagopyrum* spp.)
11. Cultivation and utility of foxtail millet (*Steria italica*)
12. Fodder crops: methods of domestication and utility of alfalfa (*Medicago sativa*);
13. Extraction and processing of mustard and sunflower oil.
14. Plant fibers;
15. Origin, evolution and processing of cotton
16. Origin, evolution and processing of jute.
17. Cultivation and commercial importance of some rosaceous fruits grown in Kashmir (apple, apricot)
18. Cultivation and commercial importance of some nuts grown in Kashmir (walnut, almond)
19. Wild vegetables of Kashmir (*Taraxicum officinalis*, *Convolvulus* spp.)
20. Spices and condiments
21. Origin, distribution, cultivation and importance of Zeera (*Bunium persicum*), saffron (*Crocus sativus*).
22. Forest cover in J & K UT
23. General morphology and diversity of commercially important soft wood species—pine, deodar.
24. General morphology and diversity of commercially important hard wood species—willow, poplar.
25. General morphology and diversity of commercially important hard wood species—walnut.
26. Wood elements in gymnosperms, monocots and dicots;
27. Formation of wood in gymnosperms (*Pinus*),
28. Formation of wood in dicots (General),
29. Types of wood— Early wood and late wood, soft wood and hard wood, sapwood and heartwood
30. Properties of wood
31. Chemical constituents of wood- cellulose, hemicellulose and lignin
32. Wood preservation processes — non pressure and pressure processes;
33. Wood seasoning— Concept & importance;
34. Special seasoning methods— drying by boiling in oily liquids and vacuum drying.
35. Wicker works and their importance as sources of income
36. Wood resources in sports items (cricket bats, hockey sticks, base ball bats);
37. Wood as fuel
38. Plywood
39. Gums and resins concept, important sources and their commercial value;
40. Dyes and tannins, extraction, processing and use.

Bioindustries

1. Industrial revolution: Causes and consequences;
2. Industrial economic sectors: Primary, Secondary, Tertiary and Quaternary Sectors;
3. Small scale industries and their importance;
4. Entrepreneurship— concept, entrepreneurial skills; Self employment.
5. Bioindustry-Concept and recent trends in development of Bioindustry
6. Role of natural resources in economic development.
7. Bioindustries in India
8. Status and scope of agriculture.
9. Status and scope of fisheries.
10. Status and scope of sericulture
11. Status and scope of forestry
12. Status and scope of dairy industry
13. Status and scope of sheep industry
14. Status and scope of Floriculture
15. Status and scope of Textile industry
16. Status and scope of Horticulture industry
17. Fresh fruits—harvest, processing & storage and marketing.
18. Dry fruits—harvest, processing & storage and marketing.
19. Status and scope of Apiculture,
20. Status and scope of tannery,
21. Status and scope of pisciculture,
22. Status and scope of ornamental horticulture
23. Status and scope of herbal drug industry.
24. Sustainable development: Concept, indicators of sustainable development
25. Agriculture crop production trends and demand for staple food
26. Composting, vermicomposting- methods, materials and advantages
27. Pulping (mechanical and chemical pulping)
28. Municipal wastes -segregation and uses
29. Bio-based plastics and fibres
30. Marketing strategies for bioresource products- Product launching, evaluation and advertisements, value addition
31. Intellectual property rights (Patents, Copy rights & Trademarks)
32. Concept of Bio-villages and biotechnological parks
33. Entrepreneurship, Small scale industries
34. Self-employment schemes in relation to bioindustries
35. Concept of green entrepreneurship
36. Quality assurance and quality control of bioindustries
37. Policies responsible for establishment and development of bioindustries.

Mushroom Cultivation Technology

1. Introduction and history of mushroom cultivation.
2. Scope of mushroom cultivation.
3. Classification of mushrooms—structural and ecological.
4. Identification of mushrooms.
5. Biology of mushrooms.
6. Methods of culture preparation, pure culture preparation.
7. Preservation and limitations in culture preservation
8. Preparation of spawns, mother spawn
9. Multiplication of spawn, spawning, spawn running and cropping.
10. Nature and types of substrates.
11. Preparation and treatment of substrates.
12. Methods of composting and role of composting in mushroom cultivation.
13. Qualities of good compost; Casing and casing material used in mushroom cultivation.
14. Cultivation of white button mushroom (*Agaricus bisporus*) and its management strategies.
15. Cultivation of Milky mushroom (*Calocybe indica*) and its management strategies.
16. Cultivation of Oyster mushroom (*Pleurotus sajorcaju*) and its management strategies.
17. Cultivation of paddy straw mushroom (*Volvariella volvcea*) and its management strategies.
18. Pests and pathogens of mushrooms and their management.
19. Wild and cultivated edible mushrooms.
20. Nutritional composition of mushrooms.
21. Health benefits of edible mushrooms.
22. Medicinal mushrooms and their use in Industries.
23. Post-harvest technology
24. Preservation of mushrooms - freezing, dry freezing, drying and canning.
25. Quality assurance and entrepreneurship.
26. Packing, storage and marketing of mushrooms
27. Value added products of mushrooms
28. Mushroom collection from their natural habitat, isolation and preservation.
29. Identification and preservations of mushroom specimen.
30. Acquaintance with infrastructure, equipments and machineries required in the mushroom cultivation process