Points to remember

Unit – I (CHE110)

1. Environment is derived from the French word "environner", which means "to encircle" or "to surround".
2. Environment can be classified as: (a) Natural environment and (b) Anthropogenic or man-made environment
3. Sustainable development can be defined as "meeting the needs of the present without compromising the ability of future generations to meet their own needs."
4. Measures of Sustainable Development are: Using appropriate technology, 3-R Approach (reduce, reuse, and recycling), Promoting environmental education awareness, Population stabilization, Conservation of nonrenewable resources, Conservation of nonrenewable resources
5. Natural resources can be classified as: (a) renewable (which can be harvested continuously) and (b) non-renewable (limited in supply and cannot be replenished)
6. The study of soil is called "Pedology".
7. Process of soil formation: (a) Physical weathering (b) Chemical weathering (c) biological weathering.
8. Factors in soil formation: (a) Parent material (b) Living organisms (c) Climate (d) Topography (e) Time.
9. Parent material is the material of rocks from where the soil is formed.
10. Layers of soil is called "horizons".
11. The horizons of soil from top to down are: (1) O-horizon (partially decomposed organic matter), A-horizon (topsoil), E-horizon (eluviated layer, less clay, more sand, zone of leaching), B-horizon (subsoil, accumulated leached materials, plant roots can extend up to this layer), C-horizon (broken pieces of parent rock), R-horizon (consolidated layer of bed rock)
12. Humus means decomposed organic material from plant and animal origin
13. Functions of soil: driving nutrient cycle and water cycle, agriculture, storage and filtration of ground water, pollutant moderation.
14. Land degradation means the decrease in fertility and quality of land.
15. Natural factors of land degradation: Heavy rain, high speed wind, earthquake, flood, draught.
16. Anthropogenic factors of land degradation: Urbanization, mining, deforestation, chemical fertilizers, industrial effluents.
17. Causes of soil erosion: large scale deforestation, floods, overgrazing, high speed wind, improper agricultural techniques.
18. Effects of soil erosion: Decrease in productivity of land, desertification, deposition of soil in water bodies, reduction of agricultural land at river banks.
19. Control of deforestation: Stubble mulching (leaving the crop residue in place on land as surface covering), reduce tillage in mild-slope regions, contour bunding, contour farming.
20. Desertification means the conversion of any land into desert.
21. Causes of desertification: Natural factors (low rainfall, excessive evaporation, high salinity of soil), anthropogenic factors (excessive use of fertilizers, excessive plugging and closing of water bodies, overgrazing, over irrigation, deforestation).
22. Effects of desertification: rapid soil erosion, poor soil quality, low water table.
23. Control of desertification: promoting plantation, changing agricultural processes.
24. Commercial use of forest: timber, firewood, pulpwood, food items, gum, resins, non-edible oil, rubber, fibers, fodder, medicine

25. Ecological use of forest: production of oxygen, reduction of global warming, wildlife habitat, regulation of hydrological cycle, soil conservation, pollutant moderation, driving energy, driving nutrient cycle.
26. Deforestation: clearing is the removal of a forest or stand of trees.
27. Reforestation: The process of replanting a previously deforested area with trees.
28. Afforestation: The establishment of a forest or stand of trees (forestation) in an area where there was no previous tree cover.
29. Causes of deforestation: shifting cultivation, fuel wood requirement, excessive demand of raw materials, hydroelectric projects, road construction, mining, agriculture, overgrazing, forest fire.
30. Effects of deforestation: Habitat loss, biodiversity loss, soil erosion, natural disasters (land slide, flash flood, draught), global warming, loss of revenue, loss of forest products, siltation of rivers and canals, change in water cycle.
31. Control of deforestation: Restriction on mining activity, massive plantation, strict environmental laws, public awareness.
32. Sources of water: Surface water (Rainfall, snowfall) and ground water (Confined aquifer and unconfined aquifer).
33. Over exploitation of ground water: (a) Ground subsidence (the lowering of the land surface) (b) Lowering water table (c) Reduced surface water flow (d) increased power consumption (e) water logging (f) ground water pollution
34. Water table: Upper level of groundwater.
35. Water logging: The rising of water table very near to earth surface.
36. Types of flood: (a) Flash flood (Due to the sudden heavy rainfall, dam failure and river obstructions) (b) River floods (Precipitation over large area or/and by melting snow) (c) Coastal Floods (Due to cyclone activities like hurricanes, wind induced storms).
37. Types of draught: (a) Meteorological Drought (when rainfall in an area is significantly less than climatological mean of that area) (b) Hydrological Drought (drying of lakes, rivers and reservoirs) (c) Agricultural Drought (inadequate soil moisture resulting in decreased agriculture productivity).
38. Notable conflicts over water: (a) Tigris and Euphrates conflict (between Turkey, Syria and Iraq) (b) Nile conflict (between Egypt, Ethiopia and Sudan) (c) Jordon river conflict (between Israel, Lebanon, Jordon and Palestine) (d) Indus water treaty (between India and Pakistan. Jhelum and Chenab are in Pakistan. Satluj, Ravi, Beas are in India), Kaveri dispute (between Karnataka and Tamil Nadu), Satluj-Yamuna Link (SYL) canal dispute (between Punjab and Haryana).
39. Benefits of Dams: Electricity generation, Employment opportunity, Irrigation water supply, Drinking water supply, Reduction in famine, Flood control.
40. Environmental problems related to dams: Displacement of tribal people, Loss of forest, Changes in aquatic environment, Waterlogging near reservoir, Breeding of vectors, Microclimatic changes, Reduced water flow, Flash flood, Salt water intrusion, Sediment carrying nutrients get deposited in reservoir, Outbreak of vector-borne diseases like malaria.
41. Energy: Ability to do work.
42. Types of energy resource: Renewable (can be replenished or unlimited source) and Non-renewable (can get exhausted soon)
43. Non-renewable resources: Coal, petroleum, Natural gas, Nuclear energy (sometimes considered as renewable also)
44. Renewable resources: Solar energy, wind energy, hydro-power, tidal energy, ocean thermal energy, geothermal energy, biomass energy, hydrogen fuel.

45. Alternative energy: Any source of energy other than fossil fuel.
46. Fossil fuels are coal, petroleum, natural gas.
47. Problems of using non-renewable resources: Air pollution (from industries using coal, from automobiles using petroleum derived fuels), Water pollution (leakage during transportation, refinery waste).
48. Use of alternative energy resource: Renewable energy source will never run out, good for the environment, a reliable source of energy, energy independence for every household.
49. Limitations of alternative energy resource: Low efficiency, high cost, alternative energy is not a constant source of energy, alternative energy is generated in small quantity compared with the global demand of energy.
50. Hydro-electricity: The generation of electricity using flowing water (typically from a reservoir held behind a dam or barrage) to drive a turbine which powers a generator.
51. Advantages of hydro-electric energy: Low operating and maintenance cost, non-polluting, reliable, flexible, safer.
52. Disadvantages of hydro-electric energy: High setup cost, affects aquatic lives, limited reservoirs, affected by draught, probable seismic activity.
53. Use of solar energy: Sunspace, solar water heating, solar cooker, solar desalination system, photovoltaic energy (photo-voltaic cell / solar panel).
54. Advantages of solar energy: Free energy, reduces fossil fuel consumption, easy to install, no pollution, can be installed anywhere.
55. Disadvantages of solar energy: Doesn't work when light is not available, requires energy storage device, low efficiency.
56. Use of wind energy: Wind turbine, wind mills, transportation.
57. Advantages of wind energy: Free energy, reduces fossil fuel consumption, environment friendly, low running cost, low maintenance.
58. Disadvantages of wind energy: Installation is expensive, Threat to birds, noise pollution, problem in signal reception.
59. Use of tidal energy: Tidal barrage, tidal stream generator.
60. Geothermal energy: using hot water from the Earth as an energy source.
61. Use of Biomass energy: Biofuels (Biodiesel, Biopetrol, Biogas, Bioethanol, Biomethanol (it is called "the fuel of future").
62. Nuclear energy: Generated using radioactive elements like Uranium (U^{235}).
63. Energy recovery: Energy recovery means getting energy from waste materials.
64. Advantages of energy recovery: Reduced coal fired power plants, improved air quality, slow climate change, longer availability of crude oil, reduction of waste volume, lower fuel bills on transport.
65. Urban problems related to energy: Energy requirements for Industries, institutions and transportation in urban area is many folds higher than in rural areas, high standard of living in urban areas.
66. Solutions to urban problems related to energy: Solar energy devices, energy recovery from urban and industrial waste, biomass energy and co-generation in industry.
67. Co-generation means the generation of electricity and useful heat jointly, especially the utilization of the steam left over from electricity generation for heating.