

**SHANMUGHA
ARTS SCIENCE TECHNOLOGY & RESEARCH ACADEMY
UNIVERSITY THANJAVUR-613402.**

II-B.TECH, III SEMESTER

Sub: Environmental Studies

Time:90 Min

Sub.Code: BICOCE 301

Max Marks: 50

**PART A (10 X 2 = 20)
Answer All Questions**

Q1. What is Troposphere?

Troposphere is the lowest portion of earth's atmosphere (just below strato-pause) extending 7 km (at poles) to 20km (at tropical region), characterized by presence of almost 75% mass of the atmosphere (consisting of almost all gases and aerosols) and is responsible for all meteorological phenomenon.

Q2. Give the importance of Environmental Studies

Environmental studies is essential for (a) creating an awareness of the environmental degradation associated with our various developmental activities through control of both resource depletion as well as pollution and (b) maintaining balance in the ecosystem for sustainability of its biotic and abiotic components.

Q3. What is Greenhouse effect?

Green House Effect (GHE) refers to the rise in temperature in the troposphere due to high concentration of certain gases (namely, water vapor, carbon dioxide, nitrous oxide, methane, etc.), that trap energy from the sun. Although GHE is essential for our survival because, without this average temperature of atmosphere would be about 60°C colder; yet higher concentration of these gases (called green house gases) can result in further rise in atmospheric temperature, leading to several detrimental effects upon the planet (such as global warming, sea-level rise, climatic variation, etc.)

Q4. What is meant by transpiration?

Transpiration is the evaporation of excess water from aerial parts and of plants, especially leaves (but also stems, flowers and fruits), caused by opening up of stomata, causing diffusion of water with dissolved nutrients drawn from the soil through xylem, with a side effect of reception of atmospheric carbon dioxide gas for use in photosynthesis. This is an essential component of hydrological cycle in maintaining balance between ground water/ soil moisture and atmospheric water vapour.

Q5. Define 'Prospecting' in mineral exploration

Prospecting is the first stage in mining, involving physical search of minerals, fossils and precious ores. It involves geophysical, geochemical or geological exploration methods to assess the need of bore-hole drilling for estimating the economic and technical feasibility of mining. It is associated with several environmental hazards including deforestation, formation of sinkholes, soil erosion, contamination of ground/surface water, loss of biodiversity, mining-induced-seismicity and so forth.

Q6. What are the effects of floods?

The effects of flood include :

Health-aspects : severe disturbance and dislocation in lives of the affected people, injuries and death both due to direct impact as well as by water-born or vector-born diseases

Agricultural aspects: drowning of crops (depends on crop-susceptibility and duration of flooding), submergence of crop storage facilities, loss of their properties, topsoil erosion leading to reduced productivity,

Built-environmental aspects-aspects : destruction of houses (wash away by impact, floatation by rising waters, damage by inundation as well as debris deposition), collapse by undercutting foundation.

Social aspects: loss of occupation, migration, etc.

Apart from these losses, some benefits may also be associated with flood, such as periodic silt deposits with added nutrients, filtering or dilution deposited pollutants, preservation of wetlands, recharging ground water, maintaining river ecosystem, and so forth.

Q7. Differentiate Renewable and Non-renewable energy sources

Renewable resources are those resources which can be replenished through relatively rapid natural cycles (or their total reserve can be maintained by controlled usages) such as forest, water, air, etc.; whereas non-renewable resources cannot be recycled nor replenished by normal- natural processes (or, at least, short or moderate duration natural cyclicity) such as fossil fuel energy, minerals, etc.

Q8. Give any four impacts of Land slides

Some of the prominent impacts of landslide are : soil erosion, loss in soil nutrient, loss of crop yield, destruction of natural vegetation as well as existing ecosystem, change in landform (and resultant landuse and micro-climatic characteristics), disturbance of hydrological regimes, etc.

Q9. What is Fuel Cell?

It is a device meant for electro-chemical energy conversion, that converts hydrogen and oxygen into water, resulting in electricity and heat, which can directly be utilized. It is something like a battery , which can be recharged using hydrogen and oxygen (instead of electricity) and it keeps producing electricity as long as the fuel is supplied.

A typical fuel cell consists of two electrodes with a layer of electrolyte sandwiched between them. In this cell, the fuel (hydrogen) is provided through anode and oxygen (in the form of air) through cathode, where due to electrolytic dissociation of hydrogen atom and recombination with oxygen atom (through suitable catalysts), electricity is generated through the wire connecting the electrodes. Since this technique relies on chemistry, rather than combustion, it is, the least polluting combustion technique, known so far. It can use the fuel (i.e., hydrogen) from a varieties of sources, such as natural gas, gasoline, methanol, and so forth.

The most important problems associated with fuel cell is the danger in storage of hydrogenated fuels, pollution due to impurities associated with fuels used, etc.

Q10. What is meant by Geo-thermal Energy

This refers to the energy recovered from heat of earth's interior, either through natural vents (such as geysers and hot-springs) or bore-holes. The heat can be used for domestic or industrial heating or even to produce electricity (through steam and generators). The geothermal potential varies from region to region depending on varying geothermal gradients. It is widely used in countries like Iceland, Japan, Italy, California and New Zealand. Since, this is a perpetual source of energy and is not related with any known toxic pollutants, its utility is mostly confined by geothermal characteristics of a region, the available technology and requirements.

PART-B (3 X 10 = 30) (Answer any THREE questions only)

Q11. Discuss the various renewable sources of energy in detail.

Types and method of extraction; suitability and limitation :

Solar (thermal- reflective and refractive modes, air-heating and photovoltaic), Wind, Geothermal , Marine [Ocean Thermal Energy Conversion (OTEC), Tidal/wave action] and biomass [combustion, petro-crops, decomposition]

Q12. Discuss the causes of Land degradation

Causes of Land degradation:

Physical (erosion, desertification, anaerobism, pollution, unsustainable usage);

Chemical (acidification, leaching, decrease in cation detection capacity, fertility depletion, pesticide-toxicity)

Biological (reduction in biomass, decline in biodiversity)

Q13. Discuss the World Food problems with a case study

World food Problem :

Food availability- types and consumption pattern, unequal distribution, unsustainable land usage, cash-crop, mechanized unsustainable cultivation- favouring riches, encroach on the available agricultural land, shifting in occupational pattern]

Case study : Somalia food scarcity, or any region related to your experience- with detailed analysis of the causes and magnitude.

Q14. Explain the conflicts over water distribution in India.

Types of water conflicts:

1. control of water resources
2. as a military tool
3. as a political tool
4. terrorism
5. military target
6. developmental disputes

Indian disputes : Cauvery (Karnataka and TN), Telgu-ganga (AP and TN), Tungabhadra (Karnataka – AP), Godavari (Maharashtra & AP), etc. Mostly for political and developmental dispute for water utilization.
