**M.A. ENVIRONEMTNAL EDUCATION (F)**

# Paper V: Environmental Impacts and Education

**Max. Marks: 100**
**Time: 3 Hours**

**Note: Nine questions will be set in all. Question No. 1, which will be short answer type covering entire syllabus, will be compulsory. Candidate will have to attempt five questions including the compulsory question. All questions carry equal marks.**

**1. Concept of Ecosystem**
- **1.1** Temporary Vs. Permanent ecosystem
- **1.2** Relationship between ecosystem organisms and environment
- **1.3** Factors that control cycling of elements in terrestrial ecosystems
- **1.4** Interactions between biotic and abiotic processes (positive and negative feedbacks)

**2. Energy Flow in ecosystem**
- **2.1** Sun as source of energy, nature of its radiation
- **2.2** Heat budget of the earth, earth's temperature and atmosphere
- **2.3** Energy flow models

**3. Major Biomes of the world**
- **3.1** Concept of biomes
- **3.2** Terrestrial biomes: Grasslands, Desserts, Forests
- **3.3** Aqauatic biomes
  - **3.3.1** Fresh water biomes (Lentic and Lotic)
  - **3.3.2** Marine Biomes

**4. Remote Sensing and its application in Ecology**

**5. Standards for Environmental Quality Assessment and Monitoring**
- **5.1** Environmental protection standards in India
- **5.2** International Standards for Environmental Protection
- **5.3** Environmental Quality Monitoring : ISO 14000
- **5.4** ISO 14000 – Impact on developing Countries

**6. Environmental Impact Assessment (EIA)**
- **6.1** Origin and development
- **6.2** Development and environment appraisal process in India
- **6.3** EIA – purpose & aim, values & Principal and process
- **6.4** Environment components of EIA
- **6.5** Main participants of EIA process
- **6.6** Impact identification methods

**7. Environmental Audit**
- **7.1** Introduction: Definition; types of auditing
- **7.2** Features of Effective Auditing

**7.3** Programme planning and organization of Auditing Programme
**7.4** Pre visit data collection Auditing Protocol
**7.5** Onsite Audit; Data Sampling; Inspection and Evaluation & Presentation
**7.6** Audit Report; Action plan
**7.7** Management of Audit
**7.8** Benefits of Environmental Audit
**7.9** Environmental Audit Programmes in India

## Paper VI: Natural Resources

**Max. Marks: 100**
**Time: 3 Hours**

**Note: Nine questions will be set in all. Question No. 1, which will be short answer type covering entire syllabus, will be compulsory. Candidate will have to attempt five questions including the compulsory question. All questions carry equal marks.**

**1.** **Introduction to natural resources and their consumption patterns**.

**2.** **Supply and demand of natural resources**.

**3.** **Types of natural Resources**: renewable and non-renewable resources and their limitations.

**4.** **Minerals resources**:
**4.1** Their use, mining and sustainability
**4.2** Genesis of mineral deposits: endogenous and exogenous processes and their time frame
**4.3** Environmental impact of mineral production
**4.4** Mineral conservation strategies: the resource cycle.

**5.** **Land Resources**:
**5.1** Land as a resource
**5.2** Land degradation and man induced landslides
**5.3** Soil erosion and desertification

**6.** **Forest Resources:**
**6.1** Use and over-exploitation
**6.2** Deforestation and timber extract
**6.3** Dams and their effect on forest and tribal people.

**7.** **Animal Resources**
**7.1** Utility of animal resources in agriculture, transport and food.

**8.** **Food Resources:**
**9.1** World food problems
**9.2** Changes caused by agriculture and overgrazing

**9.3** Effect of modern agriculture; Fertilizer-pesticide problems
**9.4** Water logging; Salinity

**9. Energy Resources:**
**9.1** Global energy consumption and energy conservation
**9.2** Indian programmes of renewable energy
**9.3** Techniques of Energy conservation
**9.4** Non renewable energy resources: pattern of consumption, issues and options
**9.4.1** Global Energy source: an overview. Fossil fuels: reserves of coal, its classification and basic geology, Environmental impact of coal mining.
**9.4.2** Reserves of oil and gas, basic geology, Environmental impact of their production and consumption.
**9.4.3** Nuclear energy, its sources. Nuclear power plants, Nuclear waste disposal. Geothermal energy: water dominated and vapour dominated systems.
**9.5** Types of renewable energy source and their environmental significance. Sustainable development of energy resources.

## Paper VII: Wildlife and its Conservation

**Max. Marks: 100**
**Time: 3 Hours**

**Note: Nine questions will be set in all. Question No. 1, which will be short answer type covering entire syllabus, will be compulsory. Candidate will have to attempt five questions including the compulsory question. All questions carry equal marks.**

**1. Wildlife :** Current status in India, Wildlife Zones and their characteristics

**2. Inter-relationship between forest and Wild life conservation**.

**3. Current practices of conservation (World and in India):**
3.1 World Conservation strategies and conversions of biological diversity
3.2 Establishment of representative network of protected area
3.3 Management of protected area and habitat restoration.
3.4 Application of Remote sensing and GIS in habitat characterization.
3.5 Scientific management of wildlife and role of research in,
- in situ and Ex situ- conservation of threatened animals and plants
- Capture breeding program
-Wildlife education and interpretation
- Research and monitoring

**4. National and international conservation organization and their role**.

**5. Wild life census**:

5.1 Planning a wildlife census, sample counts, block counts, roadside counts, dung counts, Pug mak census, Water hole census.

5.2 Wild life tourism

**6. Role of Zoological and Botanical garden in conservation.**

**7. Restoration of endangered species and role of WWF, IUCN, UDEP, Red Data Book**

**8. Wildlife legislations in India**:

8.1 Principles and procedure for enforcement of wildlife laws,

8.2 Control of illegal trade in Wildlife

8.3 Wildlife forensics and its application as a tool in support of enforcement of wildlife law.

## Paper VIII: Water Resources & their Management

**Max. Marks: 100**
**Time: 3 Hours**

**Note: Nine questions will be set in all. Question No. 1, which will be short answer type covering entire syllabus, will be compulsory. Candidate will have to attempt five questions including the compulsory question. All questions carry equal marks.**

**1. Historic perspectives on water use and development.**

**2. The Hydrological Cycle, Climate and Weather**

**3. Water Resources**

3.1 Glaciers, surface and subsurface water, Marine water.

3.2 Impact of changing environment on water resources

3.3 Anthropogenic impacts

**4. Water quality and resources management**

4.1 Water use and consequences of ground water withdrawn, impact of agriculture on ground tables

4.2 Confined and unconfined aquifers

4.3 Salt water

4.4 Local, State & Central water management agencies

**5. Water Quality & Ecology; Water, Fish & Wildlife**

**6. Water Resources and Economic development**

**7. Water Conservation**, **Rain water Harvesting and watershed management,**

**ground water recharge**

**8. Water society:**

8.1 Water available and demand
8.2 Flood hazards and hydrology
8.3 Flood hazard planning and protection
8.4 Dams and reservoir
8.5 Droughts.

**9. Water Resources and Politics**:

9.1 Water use and conflicts
9.2 Politics of water scarcity
9.3 Interlinking of river system
9.4 Trans boundary and interstate disputes

**10. Social issues; Water and modern city, emerging water issues**

**11. Water allocation/conservation / pollutions laws**